American Recover and Reinvestment Act – Green Project Reserve

Compilation of Technical Project Information and Project Performance Information

July 31, 2012

Submitted to:

U.S. Environmental Protection Agency
Office of Wastewater Management
Municipal Support Division
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Acronyms

ADEQ	Arizona Department of Environmental Quality
AMI	Advanced Meter Infrastructure
AMR	Automatic Meter Reading
APAD	Acid-Phase Anaerobic Digestion
ARRA	American Recovery and Reinvestment Act of 2009
ATAD	Auto-Thermal Thermophilic Aerobic Digestion
BNR	Biological Nutrient Removal
BOD	Biochemical Oxygen Demand
Btu	British Thermal Unit
CCTV	Closed-Circuit Television
CEMS	Continuous Exposure and Monitoring System
cfd	Cubic Feet per Day
cfs	Cubic Feet per Second
CHP	Combined Heating and Power
CIP	Cured-In-Place
CSO	Combined Sewer Overflow
CWSRF	Clean Water State Revolving Fund
DEW	Disinfected Effluent Water
DO	Dissolved Oxygen
ECHDC	Erie Canal Harbor Development Corporation
EMS	Environmental Management System
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FBI	Fluidized Bed Incinerator
ft	Feet
GE	General Electric
GPCD	Gallons per Capita per Day
GPD	Gallons per Day
gpm	Gallons per Minute
GPR	Green Project Reserve
GRUSP	Granite Reef Underground Storage Project
HDPE	High-Density Polyethylene
hp	Horsepower
hr	Hour
HVAC	Heating, Ventilation, and Air Conditioning
I/I	Inflow and Infiltration
IDNR	Iowa Department of Natural Resources
IFAS	Integrated Fixed Film Activated Sludge
kW	Kilowatt
kWh	Kilowatt-hour
lbs	Pounds
LEED	Leadership in Energy and Environmental Design
LF	linear feet
MassDEP	Massachusetts Department of Environmental Protection

Acronyms (cont.)

MBR	Membrane Bioreactor
MCL	Maximum Contaminant Level
MG	Million Gallons
mg/L	Milligrams per Liter
MGD	Million Gallons per Day
MGY	Million Gallons per Year
min	Minute
MIU	Meter Interface Unit
MMBtu	Million British Thermal Units
MW	Megawatt
NHDES	New Hampshire Department of Environmental Services
NPDES	National Pollutant Discharge Elimination System
NYSERDA	New York State Energy Research and Development Authority
OGWDW	Office of Ground Water and Drinking Water
O&M	Operation and Maintenance
OTE	Oxygen Transfer Efficiency
PS	Pump Station
PV	Photovoltaic
PVC	Polyvinyl Chloride
RAS	Returned Activated Sludge
RBC	Rotating Biological Contactors
SBCFCD	San Bernardino County Flood Control District
SBR	Sequencing Batch Reactor
SCADA	Supervisory Control and Data Acquisition
SCCC	Suffolk County Community College
SCF	Standard Cubic Feet
scfm	Standard Cubic Feet per Minute
scfy	Standard Cubic Feet per Year
sf	Square Feet
SMSD	Southeast Macomb Sanitary District
SSES	Sanitary Sewer Evaluation System
SSO	Sanitary Sewer Overflow
TMDL	Total Maximum Daily Load
UV	Ultraviolet
VFD	Variable Frequency Drive
WAS	Waste Activated Sludge
WWTP	Wastewater Treatment Plant
yr	Year

Project Category Abbreviations

EE Energy Efficiency

EC Energy Efficient Components (VFDs, Blowers, Pumps, etc.)

EP Energy Efficient Processes (Low-Energy Treatment Technology, Gravity Sewers, Consolidation, etc.)

ER Pipe Projects or Retrofits

GP Reclaimed Gas Power Generation

OR Other Renewable Energy Generation (Including Hydroelectric, Geothermal, and Incinerator Projects)

SO Solar Power Generation

WI Wind Power Generation

WE Water Efficiency

ME Meter Installation

RE Water Reuse, Reclamation, or Recycling

WC Water Efficient Components

WF Water Efficient Fixtures

WP Water Efficient Processes (Low-Water Treatment Technology, Piping Irrigation Canals, etc.)

WR Pipe Projects or Retrofits

Background Information

On February 17, 2009, Congress passed the American Recovery and Reinvestment Act of 2009 (ARRA). ARRA had the following goals: (1) create new jobs and save existing ones; and (2) spur economic activity and invest in long-term growth. ARRA provided funding for a variety of infrastructure projects, including $4 billion dollars of supplementary funding to the Clean Water State Revolving Fund (CWSRF) Programs and $2 billion to the Drinking Water State Revolving Fund. The CWSRF is a loan assistance authority that provides low interest loans to public and private entities for water quality improvement projects.

The United States Environmental Protection Agency (EPA) Office of Wastewater Management (OWM) shares responsibility with the Office of Ground Water and Drinking Water (OGWDW) for implementing and providing oversight of the appropriated ARRA funding. Several provisions were attached to the expenditures of these funds, including the following:

- States were required to spend not less than 20 percent of ARRA funds on projects that address green infrastructure, water or energy efficiency improvements or other environmentally innovative activities. Projects funded under this provision were referred to as Green Project Reserve (GPR) projects. All fifty states and Puerto Rico met the GPR requirement and committed at least 20 percent of their CWSRF grant to projects under construction by February 17, 2010.

- Within 1 year of enactment (February 17, 2010), all ARRA funds had to be committed to projects that were either under contract or under construction.

- ARRA funding recipients had to meet requirements under the Buy American and Davis-Bacon provisions of the law.

The intent of the GPR program was to direct State investment practices in the water sector toward projects that utilize green or soft-path practices to complement and augment hard or gray infrastructure, adopt practices that reduce the environmental footprint of water and wastewater treatment, collection, and distribution, help utilities adapt to climate change, enhance water and energy conservation, adopt more sustainable solutions to wet weather flows, and promote

innovative approaches to water management problems. The majority of CWSRF projects would provide environmental, energy efficiency, or water benefits at some level; however, in order to qualify for the GPR a program, the green benefits must have been the primary motivation for undertaking a project.

EPA has provided guidance to determine which projects qualify for inclusion in the GPR program. Wherever possible, this guidance referenced existing consensus-based industry practices to provide assistance in developing green projects. In developing this guidance, EPA staff solicited input from State-EPA and EPA-Regional workgroups and the water sector. EPA staff also reviewed approaches promoted by green practice advocacy groups and water associations, and green infrastructure implemented by engineers and managers in the water sector. Using the guidance that was developed, projects that qualified for the GPR program were classified as being either "Categorical", projects that were unquestionably driven by achieving green benefits (e.g., renewable energy, green roofs, water reuse, etc.), and "Non-Categorical", projects whose green benefits were less readily apparent and required a Business Case in order to demonstrate the green benefits rationale for the project. A Business Case is documentation of the facts and reasons that justify a project's inclusion in the GPR program. Business Cases typically included: (1) a description of the project, (2) the anticipated project costs, and (3) the anticipated environmental benefits accruing from the project that merit including the project in the GPR.

All projects that were included in the GPR program were categorized into at least one of the following four GPR project primary categories:

- **Energy Efficiency** projects are defined as those projects that make use of improved technologies and practices to reduce the energy consumption, use energy in a more efficient way, and/or produce/utilize renewable energy.

- **Water Efficiency** projects are defined as those projects that make 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 for the future.

- **Green Infrastructure** projects are defined as those projects that make use of a wide array of practices at multiple scales that manage wet weather storm water flows and that maintain and restore natural hydrology by infiltrating, evapotranspiring and harvesting and using storm water. On the local scale green infrastructure consists of site- and neighborhood-specific practices, such as bioretention, trees, green roofs, permeable pavements and cisterns. On a regional scale, green infrastructure is the preservation and restoration of natural landscape features, such as forests, floodplains and wetlands, coupled with policies such as infill and redevelopment that reduce overall imperviousness in a watershed.

- **Environmentally Innovative** projects include those projects that demonstrate new and/or innovative approaches to delivering services or managing water resources in a more sustainable way.

This *Compilation of Technical Project Information and Project Performance Information* (Compilation) presents readily available information on the size, scope and purpose of projects. Included in the Compilation is information on project components and costs. energy- and water-related environmental benefits information, and any other driving considerations (e.g., multiple environmental benefits, reducing greenhouse gas emissions, carbon footprint, etc.) were presented where available. The Compilation is composed of 117 Technical Project Information Reports (Reports) that summarize the available information on the subset of GPR projects that were examined. Table 1 lists the 117 loan recipients and indicates the type of GPR project undertaken by each loan recipient.

The Reports have been developed using information collected from a variety of sources including project contact interviews, project Business Plans, the CWSRF Benefits Reporting database, and miscellaneous sources of publically available information (e.g., internet, press releases, news reporting, etc.). Project contacts were identified and contacted for an interview. Project contacts were asked to provide project descriptions and project costs and benefits.

Projects were selected as follows:

- Projects where 100 percent of ARRA funds had been disbursed were targeted for inclusion.

- Projects from two primary GPR categories (Energy Efficiency and Water Efficiency) and from each of seven Energy Efficiency subcategories and six Water Efficiency subcategories were included.

- Projects from each of the ten EPA regions and a variety of States were included.

After identifying a targeted project, a project Report was initiated and entered into a Report status tracking database. Relevant project information was collected from publically available information sources and from the CWSRF Benefits Reporting database. If available, the project's Business Case was reviewed. Information from these various sources was collected and organized into the Report and entered into the Report status tracking database. Project contact information was requested from State CWSRF officials. Contact information was used to contact project representatives and provide them with an opportunity to be interviewed. Interviews provided project representatives with an opportunity to confirm and/or expand upon the available project information as well as highlight the environmental benefits of their project.

In some cases, State CWSRF officials collected and transmitted the information normally collected during the project contact interview. There were cases where project contacts declined to be interviewed or were unable to provide much information during the interview. These cases have been noted in the Reports.

Each Report is composed of the following sections:

1) project and loan identification information;
2) a general description of the project and its primary environmental benefits;
3) identification of the information sources used to generate the Report;
4) a description of the project;
5) information on the project components and their associated costs (if available);
6) information on the project environmental and cost savings benefits (if available); and
7) project cost/benefit calculations (if possible).

Project cost/benefit calculations may include a simple payback period calculation and/or an energy savings or water savings simple cost-benefit ratio. For the purposes of the Compilation, these values were defined as follows:

Simple Payback Period: The amount of time to repay (i.e., recoup) the cost of the portion of the ARRA loan that was GPR allocated using cost savings or revenues derived from the project. The payback period was not calculated if it exceeded a 20 year project life.

Simple Cost-Benefit Ratio: A ratio composed of the total energy savings or water saving that was anticipated for a given project over a 20 year project life to the cost of the portion of the ARRA loan that was GPR allocated.

Both values were calculated using the portion of the ARRA loan that was allocated through the GPR program and did not consider the total cost of the ARRA or CWSRF loans or total project cost. In cases where a loan recipient had performed their own cost/benefit calculations, these estimates were included in the Report.

Information and calculations presented in the 117 Reports were based on the references listed in each Report. None of the information has been independently verified and no critical analysis was made of the veracity of the information.

Table 1. Project Energy Efficiency and Water Efficiency sub-category classifications.

ARRA Recipient	State	Region	Energy Efficiency							Water Efficiency					
			EC	EP	ER	GP	OR	SO	WI	ME	RE	WC	WF	WP	WR
Metropolitan District, The	CT	01				X									
Belfast, City of	ME	01	X												
Limestone Water & Sewer District	ME	01	X	X											
South Portland	ME	01	X	X											
Barnstable, Town of	MA	01	X					X	X						
Charles River Pollution Control District	MA	01	X					X							
Fairhaven, Town of	MA	01	X			X		X							
Falmouth, Town of	MA	01							X						
Greater Lawrence Sanitary District	MA	01	X				X	X							
Lowell Regional Wastewater Utilities District	MA	01						X							
Massachusetts Water Resource Authority	MA	01							X						
Pittsfield, City of	MA	01	X			X		X							
Upper Blackstone Water Pollution Abatement District	MA	01						X							
Durham	NH	01	X												
Jaffrey	NH	01					X								
Manchester	NH	01		X											
North Conway Water Precinct	NH	01					X	X							
Winnipesaukee River Basin Program	NH	01	X												
Narragansett Bay Commission	RI	01	X												
Lambertville Sewerage Authority	NJ	02	X												
Buffalo Sewer Authority	NY	02	X			X									
Canastota, Village of	NY	02	X					X							
Cuba, Village of	NY	02	X	X											
Jamestown Board of Public Utilities	NY	02				X									
Jasper, Town of	NY	02		X											
Sackets Harbor, Village of	NY	02	X	X						X					
Speculator, Village of	NY	02													X

Table 1 (cont.)

ARRA Recipient	State	Region	Energy Efficiency							Water Efficiency					
			EC	EP	ER	GP	OR	SO	WI	ME	RE	WC	WF	WP	WR
Suffolk County Community College	NY	02										X	X		
Westchester County	NY	02	X												
Talbot County	MD	03					X	X	X						
Covington, City of	VA	03				X									
Fairfax County	VA	03									X				
New Kent County	VA	03									X				
Abingdon, Town of	VA	03				X									
Culpeper, Town of	VA	03				X									
Warrenton, Town of	VA	03				X									
Westmoreland County	VA	03									X				
Lewisburg, City of	WV	03								X					
Shepherdstown, Corporation of	WV	03		X											
Childersburg Water Works, Sewer & Gas Board	AL	04	X		X										
Decatur, City of	AL	04	X		X										
Montevallo, City of	AL	04		X	X										
Moultrie, City of	GA	04				X									
Summerville, City of	GA	04									X				
Sacramento, City of	KY	04		X											
Kentucky Horse Park	KY	04					X								
Clinton, City of	MS	04		X											
Raleigh, City of	NC	04									X				
Burlington, City of	NC	04									X				
Bondville	IL	05		X											
Downers Grove Sanitary District	IL	05				X									X
LaSalle	IL	05	X												
McNabb	IL	05		X											
Reading Township	IL	05		X											

Table 1 (cont.)

ARRA Recipient	State	Region	Energy Efficiency							Water Efficiency					
			EC	EP	ER	GP	OR	SO	WI	ME	RE	WC	WF	WP	WR
South Lyons Sanitary District	IL	05		X											X
Columbus	IN	05	X												
Darlington	IN	05	X	X											
Goshen	IN	05			X										
Rensselaer	IN	05		X							X				
8 1/2 Mile Drain Drainage District	MI	05	X					X							
Genesee County Drain Commission	MI	05		X											
Midland	MI	05				X									
St. Clair County	MI	05				X									
Ypsilanti Community Utilities Authority	MI	05		X											
Ypsilanti Community Utilities Authority	MI	05		X											
Big Lake, City of	MN	05		X											
Grand Rapids, City of	MN	05		X											
Cambria, Village of	WI	05	X	X											
Grand Chute - Menasha West Sewerage Commission	WI	05	X	X											
Saint Nazianz, Village of	WI	05	X												
Batesville	AR	06		X											
Baker, City of	LA	06								X					
Carencro, City of	LA	06								X					
Killian, Town of	LA	06								X					
Vinton, Town of	LA	06								X					
Perkins Public Works Authority	OK	06		X							X				
Incorporated County of Los Alamos	NM	06									X				
Boyden, City of	IA	07	X												
Cascade, City of	IA	07	X												
Dyersville, City of	IA	07	X												
Newton, City of	IA	07	X												

ARRA Recipient	State	Region	Energy Efficiency							Water Efficiency					
			EC	EP	ER	GP	OR	SO	WI	ME	RE	WC	WF	WP	WR
Osage, City of	IA	07							X						
Colby	KS	07									X				
Hutchinson	KS	07				X									
Oberlin	KS	07						X							
Paris, City of	MO	07									X				
Columbia	MO	07	X			X									
Harrisonville	MO	07	X												
Platte Center, Village of	NE	07								X					
Sidney, City of	NE	07		X											
Pleasanton, Village of	NE	07		X											
Townsend, City of	MT	08			X										
Sioux Falls	SD	08				X									
Sioux Falls	SD	08				X									
Jackson, Town of	WY	08						X							
Buckeye, Town of	AZ	09		X											
Lake Havasu City	AZ	09									X				
Mesa, City of	AZ	09	X												
Peoria, City of	AZ	09						X							
Pima County	AZ	09		X							X			X	
Eastern Municipal District	CA	09		X											
Inland Empire Utilities Agency	CA	09									X				
Inland Empire Utilities Agency	CA	09									X				
Inland Empire Utilities Agency	CA	09									X				
Inland Empire Utilities Agency	CA	09									X				
Inland Empire Utilities Agency	CA	09		X											
Literacy for Environmental Justice	CA	09									X				
Kauai, County of	HI	09						X			X				
Palmer, City of	AK	10		X											

ARRA Recipient	State	Region	Energy Efficiency							Water Efficiency					
			EC	EP	ER	GP	OR	SO	WI	ME	RE	WC	WF	WP	WR
Wasilla, City of	AK	10		X											
Central Oregon Irrigation District	OR	10												X	
Farmers Irrigation District	OR	10					X							X	X
Swalley Irrigation District	OR	10												X	
Three Sisters Irrigation District	OR	10												X	
Airway Heights, City of	WA	10									X				
Arlington, City of	WA	10		X											
LOTT Clean Water Alliance	WA	10									X				

Notes:

Energy Efficiency –

EC = Energy Efficient Components (VFDs, Blowers, Pumps, etc.)
EP = Energy Efficient Processes (Low-Energy Treatment Technology, Gravity Sewers, Consolidation, etc.)
ER = Pipe Projects or Retrofits
GP = Reclaimed Gas Power Generation
OR = Other Renewable Energy Generation (Including Hydroelectric, Geothermal, and Incinerator Projects)
SO = Solar Power Generation
WI = Wind Power Generation

Water Efficiency –

ME = Meter Installation
RE = Water Reuse, Reclamation, or Recycling
WC = Water Efficient Components
WF = Water Efficient Fixtures
WP = Water Efficient Processes (Low-Water Treatment Technology, Piping Irrigation Canals, etc.)
WR = Pipe Projects or Retrofits

GPR Technical Project Information Reports

EPA REGION 1

Connecticut

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	CT	The Metropolitan District	CWF 633-C/DEPA00002090103

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: GP

Total SRF Loan Amount: $17,406,130

ARRA Loan Amount: $9,602,060

GPR Category Loan Amount: EE - $9,602,060

Principle Forgiveness Amount: $0

Loan Payback Period: 20 Years

General Project Description:

The Metropolitan District (District) has undertaken a project to upgrade and rehabilitate three existing incinerators and a waste heat recovery system at the Hartford Water Pollution Control Facility (Facility).

Primary Environmental Benefits:

This project will reduce the District's consumption of electricity from the local utility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Metropolitan District Website. Retrieved 4/23/2012. <http://www.themdc.com/hwpcf.pdf>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
The Metropolitan District	Tom Tyler; Manager	Phone: (860) 278-7850 E-mail: ttyler@themdc.com

Notes: Interviewed 4/23/2012.

Entity	Contact Name and Title	Contact Phone Number / Email
The Metropolitan District	Alan Pelletier; Engineer	Phone: (860) 278-7850 E-mail: apelletier@themdc.com

Notes: Interviewed 4/27/2012.

Installation of 1.75 MW Turbine Generator.

Project Narrative

The District owns and operates the Facility, a secondary wastewater treatment plant with a permitted capacity of 80 MGD. The Facility's liquid treatment train consists of headworks, primary clarifiers, extended aeration, secondary clarifiers, and chlorine disinfection. The Facility's solids treatment train consists of gravity thickening, dissolved air flotation thickeners, centrifugal dewatering, and incineration of cake solids. Incineration of cake solids is accomplished using three incinerators.

This project involves an upgrade to the Facility's three incinerators and the installation of a waste heat recovery system. The heat recovery system will capture heat from the three incinerators and use it to heat a boiler which will power a 1.75 MW turbine generator. The generator will generate electricity which will be used at the Facility. Construction on this project began in March 2010 and is scheduled to reach substantial completion in August 2012.

Project Components and Associated Costs:

The total project cost is $26,900,000. Itemized costs for project components are as follows:

- Upgrade and rehabilitation of three incinerators: the overhaul includes installation of new electrical systems, cleaning of incinerators, and installation of a SCADA system for each incinerator. Incinerator No. 3 will also receive a new venture scrubber, flue gas recirculation system, and a brick rebuild of the incinerator. ($8,200,000).
- Waste Heat Recovery System: Includes construction of system housing, instrumentation and controls, two 13,000 pounds per hour Alstom boilers, one 1.75 MW turbine generator, and a package water treatment unit. ($18,700,000).

Project Benefits

- According to the project contact, Tom Tyler, the project will generate approximately 7,630,000 kWh per year of electricity from the incineration of biosolids. Assuming an electricity price of $0.11/kWh, the cash value of the electricity production is approximately $840,000 per year.

Project Cost/Benefit Calculations

- Assuming annual savings of $840,000 per year, the simple payback period for this project is approximately 11 years.
- Over a 20 year project this life, this project is expected to produce approximately 16 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/10/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

GPR Technical Project Information Reports

EPA REGION 1

Maine

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	ME	City of Belfast	ARRA066-01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC

Total SRF Loan Amount: $2,710,000

ARRA Loan Amount: $2,710,000

GPR Category Loan Amount: EE - $100,000

Principle Forgiveness Amount: $2,040,630

Loan Payback Period: 20 Years

General Project Description:

The City of Belfast (City) has made improvements and upgrades to its wastewater treatment plant (Facility) in order to improve the reliability of treatment processes and increase the Facility's treatment capacity. Improvements made to the Facility include the replacement of three influent pumps and installing a variable frequency drive (VFD) in one of the Facility's blowers.

Primary Environmental Benefits:

The installation of energy efficient pumps and motor will reduce the quantity of electricity consumed by the Facility and reduces the Facility's carbon footprint.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: City of Belfast NPDES Permit No. ME0101532. Retrieved on 3/1/2012. <http://www.epa.gov/region1/npdes/permits/2011/finalme0101532permit.pdf>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Olver Associates, Inc.	Mandy Olver, Vice President	Phone: (207) 223-2232 E-mail:

Notes: Interviewed on 2/22/2012.

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

The Facility produces secondary effluent from residential and commercial wastewater generated by approximately 5,000 customers (1,350 service connections) within the City. The City has no significant industrial users discharging wastewater into the City's collection system. The City has an agreement with Ducktrap River Fish Farms whereby "brine waste" is delivered to the treatment plant and placed in holding tanks and then gradually added to the treatment plant influent.

The City has undertaken a project to upgrade the Facility's treatment capacity by making upgrades to the headworks, installing a new VFD for a blower, expanding disinfection units, and replacing sections of the City's sanitary sewer. GPR qualifying components of the project include the installation of three new influent pumps and the addition of a VFD to one of the existing aeration blowers. Construction started in September 2009 and reached substantial completion in May 2010.

Project Components and Associated Costs:

- Three 20 hp influent pumps ($80,000).
- One new VFD, manufactured by Allen-Bradley, added to one existing aeration blower ($20,000).

Project Benefits:

Ms. Olver indicated that post-construction performance data illustrating reductions in energy consumption would be infeasible to procure. However, Ms. Olver provided estimated cost savings due to reductions in energy consumption which were developed during the loan application process.

- The replacement of the three influent pumps with new energy efficient units will reduce energy consumption at the Facility and save the City an estimated $11,000 per year in power costs.
- The installation of the VFD will reduce energy consumption at the Facility and save the City an estimated $20,000 per year in power costs.

Project Cost/Benefit Calculations:

- Assuming an annual energy savings worth $31,000 per year, the payback period for the GPR portion of this loan is approximately 3 years.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 3/5/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/8/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	ME	Limestone Water & Sewer District	ARRA202-01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GI - Green Infrastructure

GPR Subcategory: EC, EP

Total SRF Loan Amount: $3,000,000

ARRA Loan Amount: $3,000,000

GPR Category Loan Amount: EE - $3,000,000

Principle Forgiveness Amount: $3,000,000

Loan Payback Period: 20 Years

General Project Description:

The Limestone Water and Sewer District (District) has completed upgrades to the Greater Limestone Regional Wastewater Treatment Facility (Facility). This was a regionalization project which involved closing the neighboring Limestone Wastewater Treatment Plant and upgrading the Facility to treat all the District's wastewater.

Primary Environmental Benefits:

The project will reduce the Facility's energy and water consumption.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: EPA New Release. Retreived 2/6/2012. <http://yosemite.epa.gov/opa/admpress.nsf/0/0C14C7C0BD042410852578FC006AF4B6>

Other Information Obtained ☐ **Yes** ☐ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Limestone Water & Sewer District	Jim Leighton, Superintendent	Phone: (207) 325-4788 E-mail: lwsd@maine.rr.com

Notes: Interviewed on 2/7/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

The purpose of this project is to close one of the District's two wastewater treatment plants and upgrade the remaining plant to serve as a regional solution to the District's wastewater treatment needs. With the upgrades, the capacity of the Facility was increased from a permitted discharge flow 0.25 MGD to 1.25 MGD. The District began construction on upgrades to the Facility in 2009 and construction was completed in February 2012. The Facility is scheduled to begin operations in March 2012.

Project Components and Associated Costs

Energy Efficiency Improvements

- Headworks Building: The existing electrical heating system for the headworks building has been replaced with a new fuel oil heating system. Also, existing doors and windows were replaced to improve the energy star building rating and reduce the carbon footprint. The total project cost for the improvements was approximately $61,000.
- Grit Removal System: The existing 3/4 hp grit tank drive units were replaced with new 1/2 hp drive units. The existing 3/4 hp grit dewatering screw drive was replaced with a new 3/4 hp drive unit. Each new drive is contains a new premium efficient motor. The estimated total project cost for the proposed improvements was approximately $216,000.
- Rotating Biological Contactors (RBC) & Aeration System: Twelve existing 5 hp RBC units were replaced with 6 new RBC units and a fine bubble aeration system which is supplied by two positive displacement blowers. The blowers are operated with a dissolved oxygen probe and variable frequency drive (VFD) units. The new RBC and new aeration blower motors are highly efficient in order to reduce electrical usage. The estimated total project cost for the improvements was approximately $213,000.
- Secondary Clarifiers: The existing 3/4 hp motors were replaced with new 1/2 hp motors that utilize premium efficient motors for both secondary clarifiers.
- Disinfection System: The existing 7.5 hp inlet and 7.5 hp outlet chlorine contact tank mechanical mixers were replaced with fine bubble aeration. Excess oxygen will be used to mix the sodium hypochlorite and bisulfite chemicals for chlorination and dechlorination, respectively, during the time period of May through September of each year.
- Effluent Pump Station: The three existing 75 HP, 2,700 gpm, vertical turbine pumps were replaced with new 75 HP, vertical turbine pumps. Each new pump will have a premium efficient motor and a VFD unit.
- Digester Building: The existing electrical heating system was replaced with a new fuel oil heating system. In addition, the existing doors and windows were replaced and new metal siding was installed along with insulation on the building exterior and digester tanks to improve the energy star building rating and reduce the building's carbon footprint. The total project cost for the improvements was approximately $397,000.
- Dewatering Building: This improvement consisted of replacing the existing electrical heating system with a new fuel oil heating system. The improvement also replaced existing doors and windows to improve the energy star building rating and reduce the building's carbon footprint. The total project cost for the improvements was approximately $286,000.
- Administration Building: This efficiency improvement consisted of replacing the existing electrical heating system with a new fuel oil heating system. The improvement also consisted of replacement of existing doors and windows with new doors and windows. In addition, new metal siding and insulation was installed on the exterior of the building to improve the energy star building rating and reduce the building's carbon footprint. The total project cost for the improvements was approximately $115,000.
- Generator Building: This efficiency improvement involved the replacement of the existing electrical heating system with a new fuel oil heating system. The improvement also consisted of replacement of existing door and louvers with a new door and louver to improve the energy star building rating. The total project cost for the improvements was approximately $8,600.

Water Efficiency Improvements

- Seal Water Elimination: This efficiency improvement consisted of the elimination of seal water for the grit pumps by utilization of a split mechanical seal. This process improvement consisted of the removal of the existing grit pumps, seal water piping, conduit, wire, and controls and replacement with new grit pumps with special split mechanical seals that are constructed of tungsten carbide. The process improvement eliminated the need to pump the seal water three times per day (plant water pumps, sump pumps, and effluent pumps). The elimination of seal water will also reduce the number of operating hours that the sump pumps that collects the seal water and pumps to the headwork's and the number of hours that the effluent pumps operate. The total project cost for the improvements was approximately $289,600.

Green Infrastructure Improvements

- Removal of Building Roof Drains: This efficiency improvement consisted of the disconnection of existing roof drains that are currently connected to the Facility's wastewater collection system for the Headworks, Digester, Dewatering, Disinfection, and Administration Buildings. For each building, the roof drains were redirected to the exterior of the building. The plumbing modifications will eliminate the need to pump the inflow source in the buildings sump pumps and the effluent pumps. The total project cost for the proposed improvements was approximately $60,000.

Project Benefits

Construction on the Facility upgrades is ongoing; however, cost, energy, and water savings computations provided by the District indicate that they anticipate the following benefits:

- Headworks Building: The net result of the improvements will reduce the O&M cost for the building by approximately $5,700 per year.
- Grit Removal System: The net result of the improvements will reduce the electrical usage by approximately 12,600 kWh per year and the O&M cost for the building by approximately $2,200 per year.
- RBCs & Aeration System: The elimination of 6 RBC of the existing 12 RBC units will save approximately 162,200 kWh of electricity annually. The net result of the proposed improvements will reduce the O&M cost by approximately $27,800 per year.
- Secondary Clarifiers: This process improvement will reduce the electrical usage 18,500 kWh per year and the O&M cost by approximately $3,200 per year.
- Disinfection System: The process improvement will reduce electrical consumption by approximately 25,100 kWh per year and the O&M cost by $4,300 per year.
- Effluent Pump Station: The proposed improvements will result in a net reduction of electrical usage of approximately 10,200 kWh per year and the O&M cost by approximately $1,700 per year.
- Digester Building: The net result of the proposed improvements reduced the volume of fuel used by approximately 3,100 gallons per year to heat the building and reduce the O&M cost for the building by approximately $9,200 per year.
- Dewatering Building: The net result of the proposed improvements will reduce the volume of fuel oil by approximately 1,000 gallons per year and reduce the O&M cost by approximately $2,900 per year.
- Administration Building: These improvements improved the buildings thermal envelope and reduced the energy needed to heat and cool the building and reduced heating oil consumption by 600 gallons per year and electrical used by 3,600 kWh/yr.
- Generator Building: These improvements increased the buildings thermal envelope and reduced the energy needed to heat and cool the building. The improvements resulted in a net reduction in electrical usage by approximately 600 kWh per year and reduced the O&M costs by $100 per year.
- Seal Water Elimination: The existing headworks contained two grit pumps. Each of the pumps run approximately 4 hrs per day (2,928 hrs per year of total pump run time) and each of which require 120

gallons per day of seal water (87,840 gallons per year total).

- Roof Drain Removal: This project component removed 275,000 gallons annual from the treatment process and reduced the risk for wastewater to be bypassed around the secondary treatment processes at the Facility.

Project Cost/Benefit Calculations

- The above project benefits yield total projected annual savings of $57,100 on O&M, 247,700 kWh (at $0.11 per kWh, this yields $27,000), 1,600 gallons of fuel oil (at $3.248 per gallon, this yields $5,200), and 366,000 gallons of water.
- Totaling the estimated cost savings from O&M ($57,100), electricity ($27,000), and fuel oil ($5,200) yields a total annual savings of $90,000. At this annual rate of savings, the simple payback period of the GPR funding will exceed a 20 year project life.
- Over a 20 year project life, this project will generate the energy equivalent of 1.65 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 2/6/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/8/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	ME	South Portland	ARRA 117-01

Primary GPR Category:
EE - Energy Efficiency

Secondary GPR Category:
GI - Green Infrastructure

Other GPR Category:

GPR Subcategory: EC, EP

Total SRF Loan Amount: $749,716

ARRA Loan Amount: $749,716

GPR Category Loan Amount: GI - $301,000
EE - $223,000

Principle Forgiveness Amount: $207,671

Loan Payback Period:

General Project Description:

The City of South Portland (City) has undertaken a project to increase the capacity of their Long Creek Pump Station (Pump Station) in order to reduce the quantity of combined sewer overflows occurring at the pump station. As part of this project, the City has installed variable frequency drives (VFDs) on the Pump Station pumps.

Primary Environmental Benefits:

This project will reduce the amount of energy consumed by the pump station.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Wright-Pierce Website. Retrieved on 5/8/2012. <http://www.wright-pierce.com/long-creek-pump-station.aspx>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of South Portland	Patrick Cloutier, Director of Water Resources	Phone: (207) 767-7675 E-mail: pcloutier@southportland.org

Notes: Interviewed on 5/1/2012.

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

South Portland Wastewater Treatment Facility Signage (Source: http://www.southportland.org/index).

Project Narrative

The City identified the Pump Station as an upgrade priority in their 2008 Combined Sewer Overflow (CSO) Facilities Master Plan Update. The City has a service population of approximately 23,700 people. This project involves increasing the capacity of the Pump Station in order to mitigate the occurrence of CSOs. The capacity of the Pump Station was increased from 4.6 MGD to 8 MGD. The project involved demolition of the existing pumping station, existing CSO structure, and construction of a new pumping station, new CSO structure, pervious pavement, bioretention areas, and replacement of attached sewer. New pumps installed at the Pump Station are high efficiency pumps with VFDs and replaced the existing pumps (two 125 hp pumps). Construction on the project began in July 2010 and was completed in March 2011.

Project Components and Associated Costs:

The total project cost for the energy efficiency components of the project was $165,500. Itemized costs for the energy efficiency components of the project were not available to the project contact, Patrick Cloutier, at the time of the interview.

- Two 250 hp pumps (manufactured by Flygt) with VFDs.
- One 60 hp submersible pump (manufactured by Flygt) with VFD.

Project Benefits

- Energy consumption data for the pump station was unavailable to Mr. Cloutier at the time of the interview. He was unsure whether the project had achieved energy savings.
- Prior to this project, six to ten CSOs occurred at the pump station each year. Since the project came online, there have been no CSOs at the pump station.
- According to the Wright-Pierce Long Creek Watershed project website, green infrastructure improvements increased on-site storm water infiltration and reduced the impervious surface of the approximately three acre site by approximately 70 percent from its pre-construction conditions.

Project Cost/Benefit Calculations

- In the absence of any quantitative benefits data, it is not possible to compute project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/9/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

GPR Technical Project Information Reports

EPA REGION 1

Massachusetts

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	MA	Town of Barnstable	CWSG-09-25

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: WI, EC, SO

Total SRF Loan Amount: $5,796,000

ARRA Loan Amount: $5,796,000

GPR Category Loan Amount: EE - $5,796,000

Principle Forgiveness Amount: $5,796,000

Loan Payback Period: 0 Years

General Project Description:

The Town of Barnstable (Town) installed an 819 kW photovoltaic array, and two 100 kW wind turbines at the Barnstable Wastewater Treatment Facility (Facility) and replaced portions the Facility's mechanical systems (e.g., various pumps and blowers) with more energy efficient components.

Primary Environmental Benefits:

This project will reduce the emissions of greenhouse gases and the amount of non-renewable energy that the Facility utilizes to treat wastewater.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: MassDEP Energy Management Pilot Website. Retreived on 3/19/2012. <http://www.mass.gov/dep/water/wastewater/empilot.htm>.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Massachusetts Department of Environmental Protection	Patricia Arp, Environmental Scientist	Phone: ( ) - E-mail: patricia.arp@state.ma.us

Notes: Interviewed on 3/12/2012.

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

819 kilowatt Solar Array at Barnstable Wastewater Treatment Facility (Source: http://www.nexamp.com/our-projects/overview/#).

Project Narrative

The Town of Barnstable operates an advanced treatment facility that processes approximately two million gallons of wastewater per day. The Facility serves approximately 4,000 direct customers and provides septage processing for additional customers.

In December of 2007, the Executive Office of Energy & Environmental Affairs and the Massachusetts Department of Environmental Protection (MassDEP) launched the first phase of the Massachusetts Energy Management Pilot for Drinking Water and Wastewater Treatment Facilities—a project designed to reduce emissions of greenhouse gases and the amount of energy that treatment facilities utilize to treat wastewater. This project is part of the MassDEP pilot program and the GPR program. The purpose of this project was the construction of a renewable energy project which would be used in place of non-renewable energy sources and would decrease the carbon footprint of the Facility. It encompassed the installation of a new aeration system and the construction of two wind turbines, and construction of an 819 kW solar array. The project began operations in January 2012.

Project Components and Associated Costs:

- Grit blower ($5,669).
- Chlorine and hydroxide pumps ($6,749).
- Aeration blower ($25,318).
- Water pumps ($39,815).
- Effluent pumps ($22,509).
- Sludge pumps ($43,059).
- Two 100 kW Northwind 100 wind turbines manufactured by Northwind Power Systems (capital costs not available).
- Ground mounted 819 kW solar array (capital costs not available).

Project Benefits

- Energy savings associated with improvements to the aeration system were unavailable to the project contact, Patricia Arp.
- Electricity production data for the wind turbine is unavailable. However, Ms. Arp indicated that the turbines are expected to produce approximately 282,000 kWh of electricity per year, worth approximately $39,000 per year.
- The solar array provides a renewable source of electricity and produced 68,694 kWh of electricity in its first month of operation worth approximately $9,453. Extrapolated out to a year, this yields an expected annual production of 836,000 kWh worth approximately $115,000 per year.

Project Cost/Benefit Calculations

- Assuming annual revenues of $154,000 per year for electricity production, the simple payback period of this loan exceeds a 20 year project life. Note that this calculation does not account for any savings that might be realized from improvements to the aeration system.
- The expected energy produced over a 20 year project life is 3.9 kWh per dollar invested. Note that this calculation does not account for any savings that might be realized from improvements to the aeration system.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/7/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	MA	Charles River Pollution Control District	CWSG-09-25

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: SO, EC

Total SRF Loan Amount: $847,583

ARRA Loan Amount: $847,583

GPR Category Loan Amount: EE - $847,583

Principle Forgiveness Amount: $847,583

Loan Payback Period: 0 Years

General Project Description:

The Charles River Pollution Control District (District) installed a 20 kW photovoltaic array at the Charles River Pollution Control District Treatment Facility (Facility) and installed two new energy-efficient blowers in the Facility's aeration system.

Primary Environmental Benefits:

This project will reduce the emissions of greenhouse gases and the amount of energy that the Facility utilizes to treat wastewater.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: MassDEP Energy Management Pilot Website. Retreived on 3/19/2012. <http://www.mass.gov/dep/water/wastewater/empilot.htm>.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Massachusetts Department of Environmental Protection	Patricia Arp, Environmental Scientist	Phone: ( ) - E-mail: patricia.arp@state.ma.us

Notes: Interviewed on 3/12/2012.

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Charles River Pollution Control District Wastewater Treatment Facility
(Source: http://www.mass.gov/dep/water/wastewater/empilot.htm).

Project Narrative

The District operates an advanced wastewater treatment facility with nutrient removal capabilities that can process up to 4.6 MGD of wastewater. The Facility treats the combined wastewater and domestic septage from the towns of Bellingham, Franklin, Medway, Millis, Norfolk, Wrentham, Dover and Sherborn. The Facility provides wastewater treatment for approximately 28,000 people and four significant industrial users.

In December of 2007, the Executive Office of Energy & Environmental Affairs and the Massachusetts Department of Environmental Protection (MassDEP) launched the first innovative phase of the Massachusetts Energy Management Pilot for Drinking Water and Wastewater Treatment Facilities—a project designed to reduce emissions of greenhouse gases and the amount of energy that treatment facilities utilize to treat wastewater. This project is part of the MassDEP pilot program and the GPR program. The purpose of this project was the construction of a renewable energy project which would be used in place of non-renewable energy sources and would decrease the carbon footprint of the Facility. The project began operations in March 2011.

Project Components and Associated Costs:

- 20 kW solar array ($130,000).
- Upgrading the existing fine bubble aeration system by installing two new energy-efficient turbo blowers ($835,000).

Project Benefits

- The project provides a renewable source of electricity and has produced 13,322 kWh of electricity in its first eight months of operation worth approximately $1,772. Extrapolated out to a year, this yields an expected annual production of 14,900 kWh worth approximately $2,000 per year.
- Operational data for the aeration system was not available to the project contact. According to CWSRF Benefits Reporting info, an annual savings of $102,000 was anticipated from the upgraded aeration system. Electricity savings values were not reported.

Project Cost/Benefit Calculations

- Assuming annual revenues of $2,000 per year for electricity production and $102,000 of electricity savings, the simple payback period of this loan is approximately 8 years.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/14/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	MA	Town of Fairhaven	CWSG-09-27

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC, SO, GP

Total SRF Loan Amount: $7,867,000

ARRA Loan Amount: $7,867,000

GPR Category Loan Amount: EE - $7,867,000

Principle Forgiveness Amount: $7,867,000

Loan Payback Period: 0 Years

General Project Description:

The Town of Fairhaven (Town) installed a 102 kW photovoltaic array, combined heating and power (CHP) system, and a new digester at the Fairhaven Wastewater Treatment Plant (Facility).

Primary Environmental Benefits:

This project will reduce the emissions of greenhouse gases and the amount of non-renewable energy that the Facility utilizes to treat wastewater.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: MassDEP Energy Management Pilot Website. Retreived on 3/19/2012. <http://www.mass.gov/dep/water/wastewater/empilot.htm>.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Massachusetts Department of Environmental Protection	Patricia Arp, Environmental Scientist	Phone: ( ) - E-mail: patricia.arp@state.ma.us

Notes: Interviewed on 3/12/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

This project involved the installation of an anaerobic sludge digestion system with CHP system and a solar photovoltaic (PV) installation at the Facility. In December of 2007, the Executive Office of Energy & Environmental Affairs and the Massachusetts Department of Environmental Protection (MassDEP) launched the first innovative phase of the Massachusetts Energy Management Pilot for Drinking Water and Wastewater Treatment Facilities—a project designed to reduce emissions of greenhouse gases and the amount of energy that treatment facilities utilize to treat wastewater. This project is part of the MassDEP pilot program and the GPR program. The purpose of this project was the construction of a renewable energy project which would be used in place of non-renewable energy sources and would decrease the carbon footprint of the Facility. The PV project began operations in March 2011. The CHP project is expected to reach substantial completion in spring 2012.

Project Components and Associated Costs:

- 102 kW solar array ($538,000).
- 110 kW CHP system with a new building and new digester tank ($7,228,000).

Project Benefits

- The project provides a renewable source of electricity and has produced 121,186 kWh of electricity in its first eight months of operation worth approximately $15,500. Extrapolated to a full year of operation, the system is anticipated to produce 182,000 kWh per year valued at approximately $23,300.
- Operational information on CHP system performance was not available.

Project Cost/Benefit Calculations

- Assuming annual revenues of $23,300 per year for electricity production alone, the simple payback period of this loan exceeds a 20 year project life.
- The expected energy produced from the solar array over a 20 year project life is anticipated to be 0.46 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/18/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/24/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	MA	Town of Falmouth	CWSG-09-36

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: WI

Total SRF Loan Amount: $4,865,000

ARRA Loan Amount: $4,865,000

GPR Category Loan Amount: EE - $4,865,000

Principle Forgiveness Amount: $4,865,000

Loan Payback Period: 0 Years

General Project Description:

The Town of Falmouth (Town) installed a 1,165 kilowatt wind turbine at the Falmouth Wastewater Treatment Facility (Facility).

Primary Environmental Benefits:

This project will reduce the emissions of greenhouse gases and the amount of energy that the Facility utilizes to treat wastewater.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: MassDEP Energy Management Pilot Website. Retreived on 3/19/2012. <http://www.mass.gov/dep/water/wastewater/empilot.htm>.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Massachusetts Department of Environmental Protection	Patricia Arp, Environmental Scientist	Phone: ( ) - E-mail: patricia.arp@state.ma.us

Notes: Interviewed on 3/12/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Falmouth Wastewater Treatment Facility (Source: http://www.mass.gov/dep/water/wastewater/empilot.htm).

Project Narrative

The Town operates an advanced, nutrient-removal wastewater treatment facility that has a capacity of 1.2 MGD, and processes approximately 0.384 MGD of wastewater.

In December of 2007, the Executive Office of Energy & Environmental Affairs and the Massachusetts Department of Environmental Protection (MassDEP) launched the first innovative phase of the Massachusetts Energy Management Pilot for Drinking Water and Wastewater Treatment Facilities—a project designed to reduce emissions of greenhouse gases and the amount of energy that treatment facilities utilize to treat wastewater. This project is part of the MassDEP pilot program and the GPR program. The purpose of this project was the construction of a renewable energy project which would be used in place of non-renewable energy sources and would decrease the carbon footprint of the Facility. The project began operations in March 2010.

Project Components and Associated Costs:

- One 1.65 Megawatt wind turbine at the wastewater plant ($4,992,000).

Project Benefits

- The project provides a renewable source of electricity and produced approximately 4,090,000 kWh of electricity in its first year of operation. Information on the cash value of this power production was not provided. However, assuming an electricity price of $0.11 per kWh, the value of the power production can be estimated to be worth approximately $450,000 per year.

Project Cost/Benefit Calculations

- Assuming annual revenues of $450,000 per year for electricity production, the simple payback period of this loan is approximately 11 years.
- The expected energy produced over a 20 year project life is approximately 17 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/14/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	MA	Greater Lawrence Sanitary District	CWSG-09-23

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC, SO, OR

Total SRF Loan Amount: $4,922,384

ARRA Loan Amount: $4,922,384

GPR Category Loan Amount: EE - $4,922,384

Principle Forgiveness Amount: $4,922,384

Loan Payback Period: 0 Years

General Project Description:

The Greater Lawrence Sanitary District (District) installed a 310 kW photovoltaic (PV) array and a 100 kW hydroelectric turbine, and made efficiency improvements to the mechanical and HVAC systems at the Greater Lawrence Wastewater Treatment Facility (Facility).

Primary Environmental Benefits:

This project will reduce the emissions of greenhouse gases and the amount of energy that the Facility utilizes to treat wastewater. It will also generate renewable energy on site.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: MassDEP Energy Management Pilot Website. Retreived on 3/19/2012. <http://www.mass.gov/dep/water/wastewater/empilot.htm>.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Massachusetts Department of Environmental Protection	Patricia Arp, Environmental Scientist	Phone: ( ) - E-mail: patricia.arp@state.ma.us

Notes: Interviewed on 3/12/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Greater Lawrence Sanitary District Wastewater Treatment Facility (Source: http://www.mass.gov/dep/water/wastewater/empilot.htm).

Project Narrative

The District operates a secondary treatment facility, which processes 33 MGD of wastewater. Its biosolids drying facility currently utilizes waste methane digester gas on-site for sludge drying - thereby reducing auxiliary fuel costs by up to $600,000 annually. The Facility treats municipal and industrial wastes from Andover, N. Andover, Lawrence, Metheun, and Salem, NH.

In December of 2007, the Executive Office of Energy & Environmental Affairs and the Massachusetts Department of Environmental Protection (MassDEP) launched the first innovative phase of the Massachusetts Energy Management Pilot for Drinking Water and Wastewater Treatment Facilities—a project designed to reduce emissions of greenhouse gases and the amount of energy that treatment facilities utilize to treat wastewater. This project is part of the MassDEP pilot program and the GPR program. The energy upgrades to the plant will include:

- Installing Variable Frequency Drives (VFDs) to Riverside pumping station and other wastewater motor/ pumping systems, insulating digesters and perform process maintenance, improve heat recovery system, boiler and temperature control replacements, and Energy Management System, and aeration, plant water pumping system and lighting improvements.
- Installing up to a 310 kW solar PV system (roof and ground-mounted).
- Installing up to a 100 kW hydroelectric turbine to the 60-inch diameter wastewater outfall pipe.

Project Components and Associated Costs:

- New pumps with VFDs, HVAC system, digester insulation ($1,565,000).
- Roof and ground mounted 310 kW PV system ($2,170,000).
- 100 kW hydroelectric turbine ($800,000).

Project Benefits

- After just under one year of operation, the PV system produced 433,067 kWh of electricity worth approximately $64,900. Extrapolating out to a year of operation yields an expected annual production of 460,000 kWh worth approximately $68,900 annually.
- Benefits information on the new pumps, HVAC system, digester improvements, and new hydroelectric turbine were not available.

Project Cost/Benefit Calculations

- Assuming annual revenues of $68,900 per year for electricity production alone, the simple payback period of this loan exceeds a 20 year project life. This calculation does not include savings from the non-PV system improvements. The simple payback period on the PV system capital cost is 8 years.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/14/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	MA	Lowell Regional Wastewater Utilities District	CWSG-09-25

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

GI - Green Infrastructure

Other GPR Category:

GPR Subcategory: SO

Total SRF Loan Amount: $4,666,880

ARRA Loan Amount: $4,666,880

GPR Category Loan Amount: EE - $3,952,500

GI - $714,380

Principle Forgiveness Amount: $4,666,880

Loan Payback Period: 0 Years

General Project Description:

The Lowell Regional Wastewater Utilities District (District) installed a 90 kW photovoltaic array and a new green roof at the Lowell Regional Wastewater Treatment Plant (Facility) and upgraded the Facility's mechanical aeration system blowers with new high-efficiency motors.

Primary Environmental Benefits:

This project will reduce the emissions of greenhouse gases and the amount of non-renewable energy that the Facility utilizes to treat wastewater. It will also generate renewable energy on site.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: MassDEP Energy Management Pilot Website. Retreived on 3/19/2012. <http://www.mass.gov/dep/water/wastewater/empilot.htm>.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Massachusetts Department of Environmental Protection	Patricia Arp, Environmental Scientist	Phone: ( ) - E-mail: patricia.arp@state.ma.us

Notes: Interviewed on 3/12/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Lowell Regional Wastewater Plant (Source: http://www.mass.gov/dep/water/wastewater/empilot.htm).

Project Narrative

The Facility is a combined flow, secondary level treatment facility that processes an average flow of 31 MGD of wastewater composed of storm water and domestic sewage from the City of Lowell and the towns of Chelmsford, Dracut, Tewksbury and Tyngsboro.

In December of 2007, the Executive Office of Energy & Environmental Affairs and the Massachusetts Department of Environmental Protection (MassDEP) launched the first phase of the Massachusetts Energy Management Pilot for Drinking Water and Wastewater Treatment Facilities — a project designed to reduce emissions of greenhouse gases and the amount of energy that treatment facilities utilize to treat wastewater. This project is part of the MassDEP pilot program and the GPR program. It includes the installation of a new fine bubble aeration system, a green roof, and a solar photovoltaic system. Construction was completed and the project began operations in March 2012.

Project Components and Associated Costs:

- Upgrade of the existing fine bubble aeration system by installing two (2) new energy-efficient turbo blowers ($463,000).
- Installation of a 90 kW solar photovoltaic system composed of 232 panels manufactured by Evergreen Solar ($765,000).
- Installation of 32,000 square feet (sf) of green roofs on (5) buildings ($1,000,000).

Project Benefits

- The project provides a renewable source of electricity and is expected to produce 57,600 kWh of electricity per year from the solar array. The cash value of this electricity is estimated to be worth approximately $66,000. According to the project contact, Patricia Arp, this will prevent the emission of approximately 400 tons of green house gasses in carbon dioxide-equivalents.
- Estimates of savings associated with the aeration system improvements or from the green roof were unavailable at the time of the interview.

Project Cost/Benefit Calculations

- Assuming annual revenues of $66,000 per year for electricity production, the payback period of this loan exceeds a 20 year project life. Note that this estimate does not include any savings associated with improvements to the aeration system.
- The expected energy produced over a 20 year project life is 0.25 kWh per dollar invested. Note that this estimate does not include any savings associated with improvements to the aeration system.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/7/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/8/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	MA	Massachusetts Water Resource Authority	CWSG-09-21

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: WI

Total SRF Loan Amount: $4,750,000

ARRA Loan Amount: $4,750,000

GPR Category Loan Amount: EE - $4,750,000

Principle Forgiveness Amount: $4,750,000

Loan Payback Period: 20 Years

General Project Description:

The Massachusetts Water Resources Authority (MWRA) has constructed a wind turbine at the DeLauri Pump Station.

Primary Environmental Benefits:

This project will provide MWRA with a renewable source of electricity at the DeLauri Pump Station and reduce their emissions of greenhouse gasses.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Massachusetts Water Resource Authority Online. Retrieved on 2/14/2012. <http://www.mwra.com/01news/2011/091411-charlestownturbine.html>.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Massachusetts Dept. of Environmental Protection	Patricia Arp, Environmental Scientist	Phone: ( ) - E-mail: patricia.arp@state.ma.us

Notes: Interviewed on 3/12/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

An artist's rendering of the completed Charlestown wind turbine. (Source: http://www.mwra.com/01news/2011/091411-charlestownturbine.html).

Project Narrative

The project includes a single 1500 kW wind turbine that will produce approximately 3,000,000 kWh per year of renewable electricity and cost an estimated $4.75 million. The DeLauri Pump Station, formerly the Charlestown Pump Station, is a sewerage pumping station adjacent to the Mystic River just over 2 miles north of the City of Boston center. MWRA completed a wind feasibility study in June 2009 and it was concluded that this project has the potential for significant financial and environmental benefit to MWRA. In June 2009, MWRA received a "Notice of No Hazard to Air Navigation," from the Federal Air Administration, giving height approval for the construction of a 1500 kW wind turbine project at this location for height not to exceed 386 feet above ground level. The completed turbine structure measures 364 feet high at blade peak. Project construction reached substantial completion in March 2012.

Project Components and Associated Costs:

- One 1,500 kW wind turbine, manufactured by Sinovel ($4.75 million).

Project Benefits

- The MWRA estimates that the turbine will produce 3,000,000 kWh per year of electricity and that the power generated by will save $350,000 per year.

Project Cost/Benefit Calculations

- Based on an annual energy savings of $350,000 per year, the payback period for the $4,750,000 loan will be approximately 14 years.
- This project is estimated to produce 13 kWh per dollar invested over a 20 year project life.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/7/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/8/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	MA	City of Pittsfield	CWSG-09-22

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: SO, EC, GP

Total SRF Loan Amount: $13,741,622

ARRA Loan Amount: $13,741,622

GPR Category Loan Amount: EE - $13,741,622

Principle Forgiveness Amount: $13,741,622

Loan Payback Period: 0 Years

General Project Description:

The City of Pittsfield (City) installed a 1,575 kW photovoltaic array and three 65 kW microturbines for biogas energy conversion at the Pittsfield Wastewater Treatment Plant (Facility), and replaced the Facility's mechanical aeration system with a fine-bubble diffused aeration system.

Primary Environmental Benefits:

This project will reduce the emissions of greenhouse gases and the amount of energy that the Facility utilizes to treat wastewater. It will also generate renewable energy on site.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: WaterWorld. Retrieved on 3/19/2012. <http://www.waterworld.com/index/display/article-display/5608470822/articles/waterworld/volume-26/issue-10/editorial-features/stimulus-helps-fund-energy-efficiency-improvements-at-wwtp.html>.

Other Information Obtained ☒ **Yes** ☐ **No**

Sources: MassDEP Energy Management Pilot Website. Retreived on 3/19/2012. <http://www.mass.gov/dep/water/wastewater/empilot.htm>.

Contact Information:

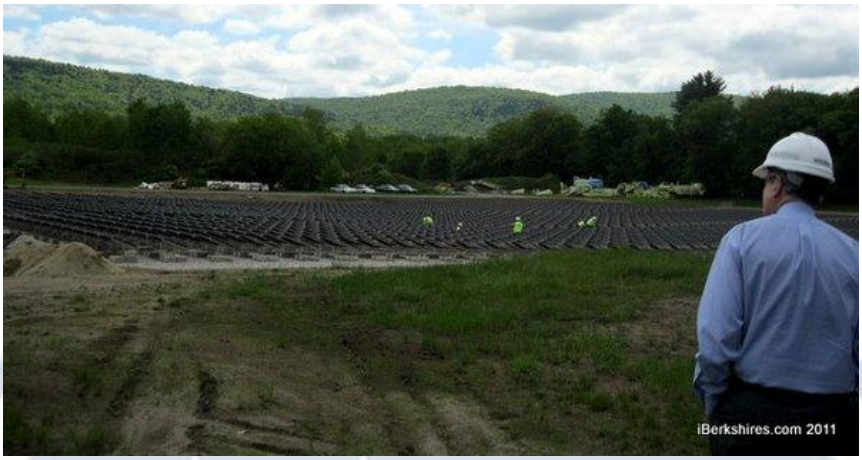
Entity	Contact Name and Title	Contact Phone Number / Email
Massachusetts Department of Environmental Protection	Patricia Arp, Environmental Scientist	Phone: ( ) - E-mail: patricia.arp@state.ma.us

Notes: Interviewed on 3/12/2012.

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.



Pittsfield Wastewater Treatment Plant Solar Array (Source: http://www.iberkshires.com/story/38644/Stimulus-Officials-Happy-With-Pittsfield-s-Solar-Project.html).

Project Narrative

The City operates an advanced, nutrient-removal treatment plant that processes approximately 10.8 MGD. The Facility treats municipal and industrial wastes from Pittsfield, Dalton, Hinsdale, Lanesborough, and North Lenox.

In December of 2007, the Executive Office of Energy & Environmental Affairs and the Massachusetts Department of Environmental Protection (MassDEP) launched the first innovative phase of the Massachusetts Energy Management Pilot for Drinking Water and Wastewater Treatment Facilities—a project designed to reduce emissions of greenhouse gases and the amount of energy that treatment facilities utilize to treat wastewater. This project is part of the MassDEP pilot program and the GPR program. The green energy upgrades to the plant will include:

- Upgrading the existing single-speed mechanical mixing system to a fine bubble aeration system, performing heating and lighting upgrades. The fine bubble diffused aeration system will feature three turbo blowers with a rate of 3,750 standard cubic feet per minute and utilize variable frequency drives (VFDs). The blowers are 15 to 20 percent more energy efficient than conventional blowers. In addition, dissolved oxygen sensors were installed which permit operators to automate blower use and improve blower-use efficiency.

- Upgrading the existing anaerobic sludge digestion system by installing three 65 kW, skid-mounted microturbines which utilize sludge digestion gas for on-site electric power generation;

- Installing up to a 1,575 kW solar photovoltaic (PV) system (roof and ground-mounted).

Project Components and Associated Costs:

- Fine Bubble Aeration System ($1,700,000).
- Combined heat and power (CHP) System ($1,670,000).
- PV System (cost not available).

Project Benefits

- After one month of operation, the solar system produced 124,255 kWh of electricity worth approximately $16,500. Extrapolating out to a year of operation yields an expected annual production of 1,620,000 kWh worth approximately $215,000 annually.
- Data on savings due to the installation of the new CHP system and new fine bubble aeration system was not available. However, reporting from Water World states that these project elements were anticipated to reduce electricity consumption by 919,000 kWh per year, worth approximately $130,000.
- Approximately 3,252 tons of carbon dioxide emission reductions are anticipated annually from these project improvements.
- Information was not available for the three microturbines.

Project Cost/Benefit Calculations

- Assuming annual revenues of $215,000 per year for electricity production and $130,000 of electricity savings, the simple payback period of this loan exceeds a 20 year project life.
- The expected energy produced over a 20 year project life is 3.8 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 3/16/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	MA	Upper Blackstone Water Pollution Abatement District	CWSG-09-33

Primary GPR Category:
EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: SO

Total SRF Loan Amount: $3,041,039

ARRA Loan Amount: $3,041,039

GPR Category Loan Amount: EE - $3,041,039

Principle Forgiveness Amount: $3,041,039

Loan Payback Period: 0 Years

General Project Description:

The Upper Blackstone Water Pollution Abatement District (District) installed a 337 kW photovoltaic array at the Upper Blackstone Wastewater Treatment Facility (Facility).

Primary Environmental Benefits:

This project will reduce the emissions of greenhouse gases and the amount of non-renewable energy that the Facility utilizes to treat wastewater. It also generates renewable energy on site.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: MassDEP Energy Management Pilot Website. Retreived on 3/19/2012. <http://www.mass.gov/dep/water/wastewater/empilot.htm>.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Massachusetts Department of Environmental Protection	Patricia Arp, Environmental Scientist	Phone: ( ) - E-mail: patricia.arp@state.ma.us

Notes: Interviewed on 3/12/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Upper Blackstone Wastewater Treatment Facility (Source: http://www.mass.gov/dep/water/wastewater/empilot.htm).

Project Narrative

The District owns and operates a 56 MGD secondary wastewater treatment facility. This project involves the installation of 337 kW of ground-mounted solar photovoltaic panels and associated site work, inverters, electrical conduits and connections to existing electrical substations. The panels will be gold-connected and supply renewable electricity to the Facility.

In December of 2007, the Executive Office of Energy & Environmental Affairs and the Massachusetts Department of Environmental Protection (MassDEP) launched the first phase of the Massachusetts Energy Management Pilot for Drinking Water and Wastewater Treatment Facilities—a project designed to reduce emissions of greenhouse gases and the amount of energy that treatment facilities. This project is part of the MassDEP pilot program and the GPR program. The purpose of this project was the construction of a renewable energy project which would be used in place of non-renewable energy sources and would decrease the carbon footprint of the Facility. Construction on the project began in April 2011, and substantial completion is scheduled for July 2012.

Project Components and Associated Costs:

- A 1,606 panel, 337 kW solar array manufactured by Evergreen Solar ($3,110,000).

Project Benefits

- The system has not yet begun operations. According to the project contact, Patricia Arp, the project is designed to produce 405,000 kWh of electricity annually. Assuming a cost of $0.11 per kWh for electricity, the annual cost savings of this project is expected to be approximately $45,000 per year.

Project Cost/Benefit Calculations

- Assuming annual revenues of $45,000 per year for electricity production, the payback period of this loan exceeds a 20 year project life.
- The expected energy produced over a 20 year project life is 2.7 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/7/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

GPR Technical Project Information Reports

EPA REGION 1

New Hampshire

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
4 - Atlanta	NC	Durham	333161-09

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC

Total SRF Loan Amount: $2,676,640

ARRA Loan Amount: $1,338,320

GPR Category Loan Amount: EE - $339,400

Principle Forgiveness Amount: $1,338,320

Loan Payback Period: 20 Years

General Project Description:

The Town of Durham (Town) has a project to replace pumps at the Dover Road Pump Station (Dover PS) and the aeration system at the Durham Wastewater Treatment Facility (Facility).

Primary Environmental Benefits:

The project will reduce electricity consumption at the Station and Facility and reduce their carbon footprint.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Durham Referendum Information Sheet. Retrieved 6/11/2012. <http://www.ci.durham.nh.us/generalpdfs/Dover_Road_Pump_Station_Info_Sheet.pdf>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources: Public Service of New Hampshire. Retrieved 6/11/2012. <http://www.psnh.com/MediaCenter/Press-Releases/2011-Press-Releases/Wastewater-Treatment-Facility-Gets-Efficient.aspx>

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Town of Durham	David Cedarholm, Town Engineer	Phone: (603) 868-5578 E-mail: dcedarholm@ci.durham.nh.us

Notes: Interviewed on 4/5/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Project Narrative

The Town owns and operates the Dover PS, a 7 MGD pump station, which is a critical element within the Town's wastewater collection system. In recent years, the Town has observed that the Dover PS has become increasingly unable to meet the system's pumping demand. The existing pump station is located in a building along the Oyster River on the south side of Route 108 near Beards Creek and possess a long list of deficiencies some of which include the following:

- The three original 50 hp pumps have each been rebuilt three times and have more than served their useful purpose. Newer more efficient pumps are expected to reduce energy consumption by 10 percent;
- The flat roof leaks and regularly threatens to short-circuit the electrical controls; (3) the electrical controls are outdated, fail to meet today's electrical standards, and do not provide sufficient redundancy in case of accidental shut-down;
- The comminutor room is an extremely hazardous work environment and is impossible to maintain in a safe manner. This becomes complicated when the wetwell, which is located below the comminutor room, overflows and floods the room to the ceiling with raw wastewater requiring many hours of labor to remedy.

A malfunction or accidental shut-down of the 40 year old pumps and/or the outdated electrical controls may result in an uncontrolled discharge of raw wastewater into the Oyster River requiring a costly cleanup. Therefore, the Town has completed a project to renovate the Dover PS, including installing three new pumps and a self-cleaning pump wetwell.

In addition, the Town has installed new blowers in the Facility's aeration system. The new turbo type centrifugal blowers replaced the existing dual lobe positive displacement blowers. The blowers utilize variable frequency drives (VFD) networked into the Facility's existing SCADA system that automatically changes the blower speed based on current operating requirements. Construction on the project began in February 2010 and reached substantial completion in July 2011.

Project Components and Associated Costs:

The total project cost specific project component information was not available to the project contact, David Cedarholm, at the time of the interview. The available information on project components collected from publically available sources are as follows:

At the Dover PS:

- Three new pumps were installed.
- New self-cleaning pump wetwells have been installed.

At the Facility:

- An unspecified number of turbo centrifugal blowers with VFDs were installed and replaced the existing dual lobe positive displacement blowers.

Project Benefits

Project benefits information was not available to Mr. Cedarholm at the time of the interview or during two subsequent contacts.

- According to a Durham Voter Referendum Information Sheet, the new pumps at the Dover PS are anticipated to reduce electricity consumption by 10 percent. The electricity consumption prior to or following project completion was not available.
- According to a Public Service of New Hampshire press release, the new aeration blowers will save the Town 217,300 kWh per year and produce $39,000 in annual savings. In addition, the new aeration system is anticipated to reduce carbon emissions by 12,000 pounds of carbon dioxide per year.

Project Cost/Benefit Calculations

- Based on savings due to the aeration system improvements alone, the simple payback period for the loan is approximately 9 years. This calculation does not account for savings due to pump improvements at the Dover PS.
- Based on energy savings due to the aeration system improvements alone, this project is anticipated to save 13 kWh per dollar invested. This calculation does not account for savings due to pump improvements at the Dover PS.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/11/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	NH	Jaffrey	333238-08

Primary GPR Category:
EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: OR

Total SRF Loan Amount: $2,871,000

ARRA Loan Amount: $1,435,500

GPR Category Loan Amount: EE - $100,485

Principle Forgiveness Amount: $1,435,500

Loan Payback Period: 20 Years

General Project Description:

The Town of Jaffrey (Town) has a project to install a new tertiary filtration process at the Jaffrey Wastewater Treatment Plant (Facility) and a new wood pellet fired boiler.

Primary Environmental Benefits:

This project will reduce the consumption of fossil-carbon derived electricity at the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☐ **Yes** ☒ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Town of Jaffrey	Randy Heglin, Public Works Director	Phone: (603) 532-7445 E-mail: rheglin@townofjaffrey.com

Notes: Interviewed 3/8/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Jaffrey Wastewater Treatment Plant Pellet Silo (Source: Town of Jaffrey).

Project Narrative

The Town owns and operates the Facility which has a 0.62 MGD design capacity and provides sewage treatment services for a population of approximately 2,100. This project involved the installation a new tertiary filtration process utilizing energy efficient pumps equipped with variable frequency drives (VFD), and a new wood pellet fired boiler which provides heating for the Facility. Wood pellets for the boiler are being purchased from New England Wood Pellet.

The project contact, Randy Heglin, commented that the ARRA/GPR loan had been very helpful and that installation of the new boiler would not have been infeasible without the GPR program. Construction on the project began in January 2010 and reached completion in May 2011. The new boiler began operating in November 2011. Specific information on project components, costs, and benefits were not available to Mr. Heglin during the interview, nor were they available during subsequent contacts.

Project Components and Associated Costs:

Information on the total project cost is unavailable. The available information on project components is as follows:

- Two new filter pumps with VFDs (capital cost unavailable).
- One new, 164,000 Btu/hr wood pellet-fired boiler manufactured by Okofen, Inc., pellet silo with 15 tons capacity, and pellet feed system ($100,000).
- Heat pump manufactured by Trane, Inc. ($50,000).

Project Benefits

- Project benefits information is unavailable.

Project Cost/Benefit Calculations

- Absent cost and benefit information, it is not possible to compute project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/13/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	NH	Manchester	333192-36

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $5,750,000

ARRA Loan Amount: $2,875,000

GPR Category Loan Amount: EE - $2,875,000

Principle Forgiveness Amount: $2,875,000

Loan Payback Period: 20 Years

General Project Description:

The City of Manchester (City) has renovated the solids incineration process at the Manchester Wastewater Treatment Plant (Facility).

Primary Environmental Benefits:

The incinerator produces energy used to heat buildings within the Facility. The energy is produced through combustion of dried biosolids at an on-site incinerator.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: City of Manchester Website. Retrieved on 2/21/2012. <http://www.manchesternh.gov/website/Departments/EnvironmentalProtection/Wastewater/tabid/270/Default.aspx>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Manchester	Fred McNeil, Chief Engineer	Phone: (781) 224-6310 E-mail: fmcneill@manchesternh.gov

Notes: Interviewed on 2/23/2012

Entity	Contact Name and Title	Contact Phone Number / Email
AECOM	Matthew Formica, Project Engineer	Phone: (781) 224-6310 E-mail: matthew.formica@aecom.com

Notes: Interviewed on 2/23/2012

Installation of New Incinerator (Source: AECOM).

Project Narrative

The City owns and operates the Facility which is designed to treat an average daily flow of 34 MGD of municipal wastewater, with a peak wet weather design flow of 56 MGD, to secondary level of treatment. The liquid treatment train is composed of screening and grit removal, primary clarifiers, an activated sludge process, and chlorine disinfection. The Facility has one fluidized bed incinerator (FBI) that is operated during sludge dewatering to burn the dried sludge. The FBI was sized to burn all of the sludge and scum produced at the plant while meeting all New Hampshire and EPA air emission regulations.

The City's project is to upgrade and renovate their FBI. The FBI is used to incinerate biosolids produced in the Facility's liquid treatment train and capture heat from the combustion process. Captured heat is used to provide heating to two buildings within the Facility. Construction on the project began in December 2010 and reached substantial completion in February 2011.

Project Components and Associated Costs:

- One Quencher/Venturi Scrubber, manufactured by Emtrol, Ltd. ($270,000).
- 100 square feet (sf) of silicon carbide brick ($40,000).
- 100 sf of FBI steel shell repair/replacement ($110,000).
- 1,200 sf of refractory ($235,000).
- 1,200 sf of insulation ($75,000).
- 20 feet of 48-inch diameter air supply ductwork with multiple flanged outlets and bends ($65,000).
- One Tuyere Manifold ($35,000).
- Seventeen 6-inch diameter, 18 feet long Tuyere castings, manufactured by May Foundry ($90,000)
- 7 feet of 80-inch diameter gas outlet ductwork ($65,000).
- One expansion joint, manufactured by Wahlco Metroflex, Inc. ($50,000).
- Continuous Exposure and Monitoring System (CEMS) and enclosure, from Trace Environmental Systems, Inc. ($220,000).
- Blower starters, manufactured by General Electric ($80,000).

Project Benefits

- The City is able to utilize captured heat for two on-site buildings. When the FBI is not in operation, 1,500 gallons per day of No. 2 fuel oil is required to heat the buildings. Mr. McNeill estimated that 1,500 gallons per day of No. 2 fuel oil costs the City approximately $4,500 per day.

Project Cost/Benefit Calculations

- According to Mr. McNeill, the FBI operates approximately 50 percent of the time. Assuming a $4,500 per day savings during operation, the project generates approximately $820,000 per year in fuel oil savings.
- Assuming $820,000 per year in cost savings, the payback period on the GPR portion of this loan is approximately 4 years.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 3/1/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/8/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	NH	North Conway Water Precinct	333066-03

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: SO, OR

Total SRF Loan Amount: $2,400,000

ARRA Loan Amount: $1,200,000

GPR Category Loan Amount: EE - $1,200,000

Principle Forgiveness Amount: $1,200,000

Loan Payback Period: 20 Years

General Project Description:

The North Conway Water Precinct (Precinct) has installed a solar panel array and geothermal wells at the North Conway Wastewater Treatment Plant (Facility).

Primary Environmental Benefits:

This project will reduce the Facility's consumption of fossil carbon derived electricity and heating oil, and will reduce the Facility's carbon footprint. It will also generate renewable energy on site.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: New Hampshire Drinking Water and Groundwater Buraeu. Retrieved 4/6/2012. <http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-11-25.pdf>.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
North Conway Water Precinct	David Bernier, Superintendant	Phone: (603) 356-5382 E-mail: dbernier@ncwpnh.org

Notes: Interviewed 3/9/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

North Conway Wastewater Treatment Plant Solar System (Source: North Conway Water Precinct).

Project Narrative

The Precinct owns and operates the Facility, a 1.5 MGD treatment plant that provides wastewater collection and treatment services for 4,500 residents in the Towns of Bartlett and Conway. This project involved augmenting the Facility power supply by installing 744 solar panels, and 16 geothermal wells to use the ground's thermal energy for the heating, ventilation and air conditioning system. In addition, the Facility's existing 90,000 gallon oil-fired boiler, which was oversized and operated at approximately 70 percent efficiency, was replaced with new boilers which operate with 92 percent efficiency. David Bernier, the project contact, indicated that the Precinct views this project as successful and has been instrumental in reducing operational costs at the Facility. This in turn has permitted the Precinct to reduce the wastewater treatment budget while maintaining their current level of service. Substantial completion on the solar array was July 2011. The balance of the project was completed in November 2011.

Project Components and Associated Costs:

Itemized costs for the following components were not available to Mr. Bernier at the time of the interview. According to Mr. Bernier, the total project cost was $1,953,000.

- 744 Solon Blue 255 watt solar modules and Schletter ground mounted racking system. Total system output is 167.4 kW.
- Two 75 kW power inverters.
- Two 1.8 million Btu/hr, 92 percent efficient condensing oil fired boilers.
- Sixteen 470 foot, 6-inch diameter geothermal wells.
- Four heat pumps.
- One Waukesha variable frequency drive unit was installed on an existing building HVAC unit.

Project Benefits

- Mr. Bernier reported that, based on the first four months of operation, the Facility is on track to reduce its fuel oil purchases by 15,000 gallons per year (worth approximately $35,000 and possessing an energy content equivalent to 630 kWh) and reduce its electricity purchases for cooling by an estimated 3,000 kWh (worth approximately $500).
- Based on solar array performance data, the system produced 227,000 kWh of electricity in its first year of production. The cash value of this electricity was worth approximately $38,000.
- Benefits information for the VFD unit was not available during the interview with Mr. Bernier.

Project Cost/Benefit Calculations

- Assuming annual revenues of $38,000 per year for electricity production, $500 of electricity savings, and $35,000 on fuel oil savings, the payback period on the energy efficiency portion of this loan is approximately 16 years.
- Based on the first year of operation, the expected energy produced and saved over a 20 year project life is equivalent to 3.8 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 4/6/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
2 - New York City	NH	Winnipesaukee River Basin Program	333203-05

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC

Total SRF Loan Amount: $2,523,000

ARRA Loan Amount: $1,000,000

GPR Category Loan Amount: EE - $1,000,000

Principle Forgiveness Amount: $1,000,000

Loan Payback Period: 20 Years

General Project Description:

The Winnipesaukee River Basin Program (Basin Program) owns and operates the Franklin Wastewater Treatment Plant (Facility). This project involves replacing the Facility's aeration blowers and a new automated aeration control system.

Primary Environmental Benefits:

This project will reduce the Facility's consumption of electricity and reduce the Facility's carbon footprint.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: September 24, 2010 Press Release. Retrieved on 5/20/2012. <http://des.nh.gov/media/pr/2010/20100924-wrbp.htm>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Winnipesaukee River Basin Program	Sharon McMillin, Administrator	Phone: (603) 934-4032 E-mail: sharon.mcmillin@des.nh.gov

Notes: Interviewed on 4/19/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Aeration system blowers (Source: Winnipesaukee River Basin Program).

Project Narrative

Through the Basin Program, the New Hampshire Department of Environmental Services (NHDES) operates the regional wastewater collection and treatment facilities serving the Lakes Region communities. The centerpiece of this system is the Facility which is located in Franklin. At this Facility, this project replaced aging and inefficient blower equipment with new, innovative technology that meets the functional needs of the Facility, provides long-term energy and cost savings, and significantly reduces greenhouse gas emissions. Additionally, the project provides a new automated dissolved oxygen control system that further reduces energy consumption. Construction on this project was completed in November 2010.

Project Components and Associated Costs:

The total project cost was approximately $1,940,000. An itemized list of project components is as follows:

- Two 100 hp turbo blowers ($491,000).
- Two 150 hp grit blowers ($67,000).
- Automated flow controls and instrumentation ($46,000).
- Piping and valves ($132,500).
- Removal of three existing 125 hp blowers ($395,000).

Project Benefits

- According to Sharon McMillin, electricity consumption operational data was unavailable at the time of the interview. However, Ms. McMillin was able to provide a technical memorandum, produced by the Basin Program's consultant, which contained electricity consumption data for the existing system (data collection period was not reported in the technical memorandum) and projected electricity consumption and cost savings associated with the reduced electricity consumption in the following table (reproduced from the technical memorandum). The Basin Program projected an annual electricity savings of approximately 357,000 kWh per year and a cost savings of approximately $43,000 per year.

Month	Energy Savings (kWh)			Cost Savings ($)		
	Existing System	New System	Savings	Existing System	New System	Savings
January	73,892	41,671	32,221	$8,867	$5,001	$3,866
February	60,461	35,263	25,198	$7,255	$4,232	$3,023
March	103,474	70,584	32,890	$12,417	$8,470	$3,947
April	89,426	54,105	35,321	$10,731	$6,493	$4,238
May	95,498	62,101	33,397	$11,460	$7,452	$4,008
June	95,227	65,544	29,683	$11,427	$7,865	$3,562
July	70,613	40,537	30,076	$8,474	$4,864	$3,610
August	76,084	44,423	31,661	$9,130	$5,331	$3,799
September	89,211	51,542	37,669	$10,705	$6,185	$4,520
October	70,605	39,753	30,852	$8,473	$4,770	$3,703
November	47,231	31,906	15,325	$5,668	$3,829	$1,839
December	59,905	36,885	23,020	$7,189	$4,426	$2,763
Total	**931,627**	**574,314**	**357,313**	**$111,796**	**$68,918**	**$42,878**

Project Cost/Benefit Calculations

- Assuming annual savings of $43,000 per year, the payback period of this loan exceeds a 20 year project life.
- The expected energy produced over a 20 year project life is 7.2 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/30/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/20/2012

GPR Technical Project Information Reports

EPA REGION 1

Rhode Island

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
1 - Boston	RI	Narragansett Bay Commission	NBC Series 2009A

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC, GR, PP

Total SRF Loan Amount: $57,000,000

ARRA Loan Amount: $19,553,722

GPR Category Loan Amount: EE - $4,262,920

Principle Forgiveness Amount: $8,604,008

Loan Payback Period: 20 Years

General Project Description:

The Narragansett Bay Commission (Commission) is upgrading the Field's Point Wastewater Treatment Facility's (Facility) biological nutrient removal processes in order to meet newly imposed effluent limitations. As part of this upgrade, the Commission is installing energy efficient blowers, pumps, and mixers in order to reduce the Facility's energy consumption. In addition, the Commission is constructing a new Facility Administration Building which will incorporate an energy efficient HVAC system and a green roof.

Primary Environmental Benefits:

Energy efficient mechanical units used in the nitrogen removal process and in the new Administration Building will reduce the Facility's energy consumption.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: BCES News. Retrieved 2/1/2012. <http://www.bsces.org/index.cfm/page/At-Field%E2%80%99s-Point-WWTF,-Innovation-Leads-the-Way/cdid/10810/pid/10371>

Other Information Obtained ☐ **Yes** ☐ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Narragansett Bay Commission	Richard Bernier, Director of Construction	Phone: (401) 461-8848 ext 326 E-mail: rbernier@narrabay.com

Notes: Interviewed on 1/30/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Field's Point Wastewater Treatment Facility (Source: http://www.waterandwastewater.com/plant_directory/Detailed/1005.html).

Project Narrative

The Commission is in the process of upgrading the Facility to improve its nutrient removal capabilities and improve energy efficiency. The existing Facility possesses secondary treatment capacity at average dry weather flows of up to 65 MGD, sustained wet weather flows of 77 MGD, and peak hourly flows of 91 MGD. As part of a consent decree with the Rhode Island Department of Environmental Quality, upgrades will be made within the ten existing aeration tanks in order to attain the level of nitrification and denitrification (i.e., total nitrogen removal) necessary to achieve effluent nitrogen concentrations of 5 mg/L. Each aeration basin will be subdivided into a series of aerated and anoxic reactors with suspended plastic media in the aerated portion of each tank, often referred to as an Integrated Fixed Film Activated Sludge (IFAS) system. Highly efficient pump drives and turbo blowers will be installed and the project will upgrade the plant's electrical infrastructure by installing an electrical capacitor bank to reduce the peak electrical demand charges.

Additionally, The Commission will construct a new administration building for the Facility. This building will utilize a number of energy and water saving improvements, including southern facing windows, use of recycled water in toilets, a green roof, recycled construction materials, and a high efficiency HVAC system. Mr. Bernier stated that the Commission expects the new administration building to receive a LEED Silver certification from the U.S. Green Building Council. The Facility's IFAS upgrade and construction on the new Administration Building are expected to be completed by late 2012.

Project Components and Associated Costs:

- IFAS System – Nine 300 hp High Speed Turbo Blowers ($1,500,000).
- IFAS System – 120 mixers, 10 impeller pumps, and instrumentation ($2,102,866).
- Supervisory Control and Data Acquisition System ($381,008).
- Administration Building – Green Roof ($480,000).
- Administration Building – Porous Pavement ($20,000).
- Administration Building – Energy and Water Efficient HVAC, water, and electrical systems ($2,474,647).

Project Benefits

- According to reporting by BCES News, these improvements are expected to provide a 25% reduction to the Commission's annual electrical consumption. The Commission spends approximately $2,000,000 on electricity at the Facility annually. Mr. Bernier was unable to confirm these figures.
- These improvements will reduce nitrogen loadings to Narragansett Bay.

Project Cost/Benefit Calculations

- An assumed energy use reduction of 25%, as reported by BCES News, will yield approximately $500,000 in savings annually. On the basis of these savings, the GPR portion of the loan is likely to have a payback period of approximately 9 years.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 2/1/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 2/2/2012

GPR Technical Project Information Reports

EPA REGION 2

New Jersey

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
2 - New York City	NJ	Lambertville Sewerage Authority	340882-06

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC

Total SRF Loan Amount: $7,080,000

ARRA Loan Amount: $3,593,768

GPR Category Loan Amount: EE - $655,000

Principle Forgiveness Amount: $3,560,000

Loan Payback Period: 20 Years

General Project Description:

The Lambertville Sewerage Authority (Authority) has undertaken a facilities improvement project at the Authority's wastewater treatment plant (Facility) which involves the installation of a geothermal heating/cooling system, an effluent water reuse system, a high-efficiency blower, and replacement of eight rotating biological contactors.

Primary Environmental Benefits:

This project will achieve a reduction in non-renewable energy consumption as well as providing better energy efficiency at the treatment plant which will result in a reduction in operating costs.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Lambertville Sewerage Authority	Thomas Horn, Executive Directory	Phone: (609) 397-1496 E-mail: thorn@lambertvillemua.com

Notes: Interviewed on 4/16/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Lambertville Wastewater Treatment Plant (Source: Lambertville Sewerage Authority).

Project Narrative

The Authority provides sewage treatment services for a population of 6,600 people (2,400 service connections) using the Facility, which has an average daily flow of 1.16 MGD. The Authority has undertaken a facilities improvement project at the Facility which includes improvements to the primary and secondary clarifiers, chlorine contact tanks, chemical addition, electrical systems, rotating biological contactor modules, reclaimed water for beneficial reuse system improvements, and geothermal heating for administration building. The GPR component of the project involves making installing a new geothermal heating/cooling system for the Facility's Administrative Building, an effluent water reuse system, a new high-efficiency blower, and replacing eight rotating biological contactors. The effluent reuse system utilizes reused water for use on-site at the Facility. The construction began January 11, 2010. Operations of the RBCs began October 25, 2010. Substantial completion was March 31, 2011.

Project Components and Associated Costs:

- Geothermal Heating/Cooling System ($284,000).
- Effluent Water Reuse System ($56,000).
- One 40 hp high-efficiency blower, manufactured by APG-Neuros Co., Ltd. ($315,000).
- Replacing eight rotating biological contactors ($2,105,000).

Project Benefits

- Based on energy consumption data provided by Mr. Horn, the average monthly observed electricity savings are approximately 2,100 kWh per year, yielding an expected annual savings of 25,200 kWh per year. Assuming an electricity cost of $0.11 per kWh, the cash value of this savings is assumed to be approximately $2,700 per year.

TIME PERIOD	USAGE KWhr	TIME PERIOD	USAGE KWhr	DIFFERENCE KWhr
5/21/10-6/18/10	61,906	5/20/11-6/20/11	66,969	-5,063
6/19/10-7/20/10	63,475	6/21/11-7/20/11	64,202	-727
7/21/10-8/18/10	69,732	7/21/11-8/19/11	63,384	6,348
8/19/10-9/17/10	71,454	8/20/11-9/20/11	63,595	7,859
Average Monthly Savings				2,104

- Mr. Horn stated that the Authority has not yet collected data on the quantity of water saved by the effluent water reuse system. Mr. Horn stated that he believed that the system will save a quantity of water sufficient to justify the project.

Project Cost/Benefit Calculations

- Based on a cost savings of $2,700 per year, the expected simple payback period for this loan exceed a 20 year project life.
- Over a 20 year project life, this project will save an anticipated 7.2 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/7/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/24/2012

GPR Technical Project Information Reports

EPA REGION 2

New York

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
2 - New York City	NY	Buffalo Sewer Authority	6602-09-70

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: GP, EC

Total SRF Loan Amount: $17,777,801

ARRA Loan Amount: $9,123,901

GPR Category Loan Amount: GI - $45,000
EE - $175,000

Principle Forgiveness Amount: $9,123,901

Loan Payback Period: 3 Years

General Project Description:

The Buffalo Sewer Authority (Authority) has undertaken a project to reduce combined sewer overflows at the waterfront by construction of a floatables control facility (Facility). The Facility includes use of a high-efficiency HVAC system, use of premium-efficiency motors, and installation of a new biological odor control system.

Primary Environmental Benefits:

This project will consume less electricity at the Facility than alternative designs considered by the Authority.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: City of Buffalo Press Release. Retrieved on 6/13/2012.
<http://www.ci.buffalo.ny.us/Home/Leadership/Mayor/Archive_Press_Releases/2009Archives/May2009/InnerHarborInfrastructureImprovements>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

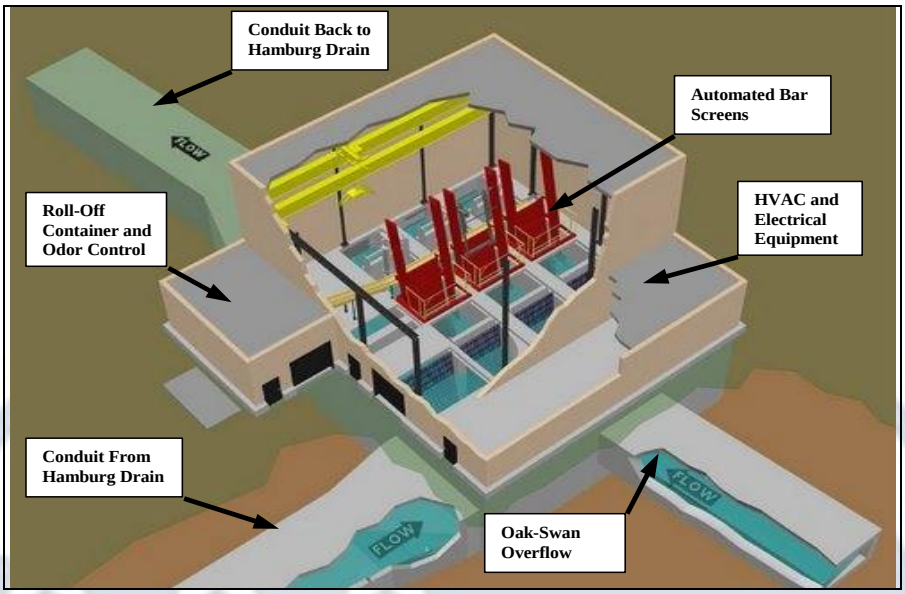
Entity	Contact Name and Title	Contact Phone Number / Email
CRA Infrastructure and Engineering, Inc.	Christopher Martin, Engineer	Phone: (716) 856-2142 E-mail: cmartin@craworld.com

Notes: Interviewed on 3/29/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.



Schematic Diagram of the Facility (Source: Buffalo Sewer Authority).

Project Narrative

The Authority owns and operates the Hamburg Drain, a combined sewer overflow (CSO) that lies within the terminus of the Erie Canal along Buffalo's waterfront. The Erie Canal Harbor Development Corporation (ECHDC) is currently implementing plans to redevelop Buffalo's waterfront, the first phase of which was completed in Spring 2008. As part of the first phase of redevelopment, several systems were installed to address the issues of low dissolved oxygen, water stagnation, and odor potential in the harbor.

The purpose of this project is the construction of floatable material abatement station, the Hamburg Drain Floatables Control Facility, located approximately a half mile upstream of the harbor's commercial slip and will be used to remove debris and floatable materials from the flow in the Hamburg Drain. The facility contains screening and materials handling equipment, as well as HVAC, electrical, and odor control equipment. Energy efficiency components of the project include use of high-efficiency motors to reduce electricity consumption at the Facility and programmable building environmental and lighting controls which reduces building heating/cooling requirements and energy consumption. Construction on this project began in March 2010 and reached substantial completion in May 2012.

Project Components and Associated Costs:

The total project cost was unavailable. Itemized project components and costs are as follows:

- Slide gate motors ($293,800).
- Submersible motors ($9,430).
- Climber mechanical bar screens ($640,000).
- Biofilter odor control system ($133,500).
- Material handling conveyor motors ($133,300).
- Traveling bridge crane ($123,000).
- Circulating pump motors ($1,500).
- Direct fired makeup air units ($40,000).
- Air conditioner ($7,500).
- Fans ($15,000).
- Stormwater recharge system ($77,500).
- High-efficiency lighting ($60,000).

Project Benefits

Operational data for the project was not available to the project contact at the time of the interview. Instead, design estimates of anticipated energy and cost savings were provided.

- Biofilter odor control system: Energy savings estimates for this improvement were not available. However, the Authority estimates an annual cost savings of approximately $9,000 per year due to reduced media replacement costs relative to traditional charcoal filtration systems.
- Premium efficiency motors: It was estimated that standard efficiency motors would consume 525,000 kWh per year, while premium efficiency motors were anticipated to consume 488,000 kWh per year. This annual savings of 37,000 kWh is worth approximately $3,000 per year.
- HVAC system improvements: Energy savings estimates were not available for this improvement. The Authority estimates that this improvement will save approximately $23,000 per year.

Project Cost/Benefit Calculations

- Based on annual cost savings of $35,000 per year, the simple payback period for this loan is approximately 13 years.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/13/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
2 - New York City	NY	Village of Canastota	6297-04-70

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC, SO

Total SRF Loan Amount: $11,165,950

ARRA Loan Amount: $5,141,495

GPR Category Loan Amount: EE - $1,514,619

Principle Forgiveness Amount: $5,141,495

Loan Payback Period: 3 Years

General Project Description:

The Village of Canastota (Village) has undertaken a project to install new aeration blowers and a new solar array at the Canastota Wastewater Treatment Plant (Facility).

Primary Environmental Benefits:

This project will reduce the consumption of fossil-carbon derived electricity at the Facility. It will also generate renewable energy on site.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
CDM	Lauren Livermore, Project Engineer	Phone: (315) 434-3282 E-mail: livermorelm@cdmsmith.com

Notes: Interviewed on 4/11/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Canastota Wastewater Treatment Plant (Source: http://www.canastota.com/organization.asp?key=45).

Project Narrative

The Facility provides sewage treatment services for the Village and nine separate collection districts located in the Town of Lenox. The Facility's total service population is approximately 45,000 people. The Village collection system is approximately 60 percent separated storm and sanitary sewers while the remaining 40 percent is combined sewer system. The Facility is capable of treating wastewater to secondary standard and has an average dry weather flow design capacity of 1.77 MGD and a peak wet weather capacity of 4.1 MGD. The energy efficiency component of the project involves the installation of new aeration blowers with premium efficiency motors, a new automated dissolved oxygen (DO) controls for the aeration blowers, and a new solar power array. Construction on this project started in February 2010 and is scheduled for completion in August 2012.

Project Components and Associated Costs:

- Three K-Turbo, 150 hp blowers ($650,000).
- 14 kW solar array, manufactured by Solon, Inc., and power inverter ($133,000).

Project Benefits

- Operational data for the blowers were not available since the aeration system is not anticipated to begin operations till August 2012. According to the project contact, the blowers are expected to reduce electricity consumption from 1,100,000 kWh per year to 770,000 kWh per year based on calculations developed during the design phase of this project. Ms. Livermore conveyed the energy savings information but was not able to share the calculations used to arrive at this result. Assuming an electricity price of $0.11 per kWh, the savings are valued at $36,300 per year.
- No information was available on the solar system or on the DO control system.

Project Cost/Benefit Calculations

- Based on an estimated savings of $36,300 per year due to the blowers alone, the simple payback period on the GPR portion of the ARRA loan exceeds a 20 year project life. The simple payback period on the blower capital cost is approximately 18 years.
- Based on an estimated savings of 330,000 kWh per year due to the blowers alone, the project is anticipated to save 4.4 kWh per dollar invested over a 20 year project life.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/13/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 6/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
2 - New York City	NY	Village of Cuba	6609-01-70

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC, EP

Total SRF Loan Amount: $2,393,200

ARRA Loan Amount: $1,414,247

GPR Category Loan Amount: EE - $536,397

Principle Forgiveness Amount: $1,414,247

Loan Payback Period: 3 Years

General Project Description:

The Village of Cuba (Village) has undertaken a project to make improvements to the Cuba Wastewater Treatment Plant (Facility) and the Village sanitary sewer collection system. These improvements include installing new pumps, a fine-bubble aeration system, and UV disinfection system at the Facility, and relining portions of the sewer.

Primary Environmental Benefits:

These improvements will reduce the quantity of electricity consumed at the Facility and the quantity of I/I occurring in the collection system.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: http://www.cuba-ny.com/pdfs/town/allegany_press_release.pdf

Other Information Obtained ☒ **Yes** ☐ **No**

Sources: http://www.wellsvilledaily.com/news/x772306265/Cuba-projects-presented-with-stimulus-package-funding

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Clark Patterson Lee Design Professionals	Tom Swift, Project Manager	Phone: (716) 372-0514 x 1401 E-mail: tswift@clarkpatterson.com

Notes: Interviewed on 3/28/2012

Entity	Contact Name and Title	Contact Phone Number / Email
Village of Cuba	Dianne Wolfson, Clerk	Phone: (585) 968-1560 E-mail:

Notes: Interviewed on 3/28/2012

Project Narrative

The Village owns and operates the Facility. The Village has undertaken a project to replace and upgrade a significant portion of the Facility and the sanitary sewer collection system, including pipe-lining, weatherization, replacement of the primary pump station, and improvements to the aeration and disinfection systems. Currently, the Village experiences significant rain and groundwater infiltration into its collection system, which overwhelms the waste treatment plant, and leads to the discharge of partially-treated sewage into New Oil Creek. New collection piping and equipment upgrades to the Facility are intended to diminish harmful sewer overflows, improve plant operational and energy efficiency and further protect the water quality of receiving waters. The Village began construction in February 2010 and was completed in June 2011.

Project Components and Associated Costs:

The total project cost was unavailable to the project contact when interviewed. Itemized project components and costs from the Business Case are as follows:

- Replace three existing primary pumps with three new VFD controlled pumps ($180,000).
- Upgrade coarse bubble diffuser systems to fine-bubble diffuser systems in solids contact tank ($60,000) and post-aeration tank ($35,000).
- Replace motors for 10 hp blowers ($2,000).
- Upgrade existing low density, low pressure UV disinfection system with an automated high intensity, low pressure UV system ($100,000).
- Install two 50 hp blowers and fine-bubble diffuser in digester ($157,500).
- Relined approximately 10,000 feet of clay tile sewer with cast-in-place polyethylene. Costs for this component were unavailable.

Project Benefits

- According to utility bills provided by the Village (see table below), energy consumption at the Facility between June 2009 and May 2011 averaged 22,387 kWh per month and cost $2,411. After the project came online in June 2011 through February 2012, the Facility averaged 25,000 kWh per month and spent $1,671 indicating an increase in energy consumption of approximately 2,700 kWh per month but a decrease in cost. Other factors such as weather and pollutant loading can affect energy consumption. The project contact did not respond to follow-up attempts to make contact.
- Data on reductions in I/I following improvements were unavailable to Mr. Swift as the Village had yet to conduct an analysis of the system. However, he stated that anecdotal evidence indicates that system performance has improved and I/I has been reduced.

Existing System			Upgraded System		
Date	Cost ($)	Electricity Consumption (kwh)	Date	Cost ($)	Electricity Consumption (kwh)
Jun-09	2430	20160	Jun-11	1857	28800
Jul-09	2695	22240	Jul-11	2169	19800
Aug-09	2799	19360	Aug-11	1374	22080
Sep-09	3394	24160	Sep-11	1643	26400
Oct-09	2406	19680	Oct-11	1474	23680
Nov-09	2438	18240	Nov-11	1424	22880
Dec-09	2530	21280	Dec-11	1663	26720
Jan-10	3427	23360	Jan-12	1833	29440
Feb-10	3115	21120	Feb-12	1604	25760
Mar-10	2466	18240			
Apr-10	3108	23680			
May-10	3321	19840			
Jun-10	3763	22080			
Jul-10	4197	23040			
Aug-10	1613	24640			
Sep-10	1236	18880			
Oct-10	985	15040			
Nov-10	901	13760			
Dec-10	1498	22880			
Jan-11	1907	29120			
Feb-11	1572	24000			
Mar-11	1823	27840			
Apr-11	2001	30560			
May-11	2232	34080			

Project Cost/Benefit Calculations

- Assuming annual cost savings of approximately $29,000 per year, the simple payback period of this loan over a 20 year project life is approximately 19 years.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/31/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/20/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
2 - New York City	NY	Jamestown Board of Public Utilities	9203-01-70

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: GP

Total SRF Loan Amount: $2,555,000

ARRA Loan Amount: $2,555,000

GPR Category Loan Amount: EE - $2,555,000

Principle Forgiveness Amount: $0

Loan Payback Period: 0 Years

General Project Description:

The Jamestown Board of Public Utilities (Board) has undertaken a project to refurbish and upgrade the two anaerobic digesters at the Jamestown Wastewater Treatment Plant (Facility). This project involves replacing two digester covers and installing a new microturbine generator with a waste heat recovery unit.

Primary Environmental Benefits:

The upgraded system will reduce the quantity of electricity purchased to operate the Facility and will reduce the Facility's carbon footprint. It will also generate energy on site using a solids handling byproduct.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Jamestown Board of Public Utilities Website. Retreived 4/24/2012. <http://www.jamestownbpu.com/ww/tour.php>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Jamestown Board of Public Utilities	Jim Butler, Project Engineer	Phone: (716) 661-1673 E-mail: jbutler@jamestownbpu.com

Notes: Interviewed on 4/23/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Jamestown Wastewater Treatment Plant Anaerobic Digester (Source: http://www.jamestownbpu.com/ww/tour/tour15.jpg).

Project Narrative

The Board owns and operates the Facility, a wastewater treatment plant capable of treating to secondary standards. The Facility is rated at 12 MGD for a service population of approximately 40,000 people.

The project involves the upgrade of existing digesters, including refurbishment of digester internal pumping, replacement of and rehabilitation of covers on the digesters, and replacement of existing gas generators with one, higher efficiency micro-turbine generator. Due to the age and condition of the equipment, the Facility was no longer able to capture and use methane gas for renewable energy from the existing sludge digesters. This project restored the bio-solids process to its intended operating performance and allowed for the use of the produced methane gas for power generation. Construction on this project was completed in late summer 2011.

Project Components and Associated Costs:

The total project cost was $3,500,000. Capital costs for specific project components include the following:

- Demolition of two existing, floating, rigid digester covers ($50,000).
- One 75-foot diameter flexible membrane cover and one 75-foot diameter fixed rigid cover (both manufactured by JDV Equipment Corp.; $750,000).
- Grit removal from digesters ($200,000).
- One 65 kW Capstone microturbine with heat recovery unit ($700,000 including cost to remove existing reciprocating engine).

Project Benefits

- According to the project contact, Jim Butler, energy savings data is not yet available. Mr. Butler indicated that energy savings are realized during summer month operation. The units have only been operated during the winter since project completion. According to Mr. Butler, the expected annual energy savings is 57,000 kWh. Assuming an electricity cost of approximately $0.11 per kWh, then the expected annual cash value of the energy savings is approximately $6,300 per year.

Project Cost/Benefit Calculations

- Assuming an estimated annual savings of $6,300 per year, the simple payback period for this loan exceeds the 20 year project life.
- Based on the estimated savings, the expected energy produced over a 20 year project life is 0.45 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 4/24/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
2 - New York City	NY	Town of Jasper	6406-03-70

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $170,442

ARRA Loan Amount: $170,442

GPR Category Loan Amount: EE - $170,442

Principle Forgiveness Amount: $0

Loan Payback Period: 0 Years

General Project Description:

The Town of Jasper (Town) has undertaken a project at the Jasper Wastewater Treatment Plant (Facility), which involves the construction of reed beds at the Facility as an energy efficient alternative for sludge management and installation of aeration equipment in the sludge holding tank that will result in reduced sludge handling costs.

Primary Environmental Benefits:

This project will reduce energy consumption at the Facility and reduce the Facility's carbon footprint.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Town of Jasper	Lucille Kernan, Supervisor	Phone: (607) 792-3576 E-mail: jaspersuper14855@yahoo.com

Notes: Interviewed on 4/25/2012

Entity	Contact Name and Title	Contact Phone Number / Email
Town of Jasper	Lin Wheaton, Facility Superintendant	Phone: (607) 368-7093 E-mail:

Notes: Interviewed on 4/26/2012

Project Narrative

The Town owns and operates the Facility, an activated sludge package plant, manufactured by Purestream, Inc., which is rated to treat 35,000 GPD. The Facility currently experiences an average daily flow of 16,000 gallons per day. The town has undertaken a project which involves the construction of reed beds as an energy efficient alternative to sludge management. Prior to the project, the Town spent $3,000 per month to ship 10,000 gallons of liquid sludge (5 to 6 percent solids) to a nearby wastewater treatment facility for treatment.

Project Components and Associated Costs:

The total project cost was $171,000.

- Two reed bed cells. Dimensions and detailed operational information on the reed beds were not available to the project contacts, Lucille Kernan and Lin Wheaton, at the time of their interviews.

Project Benefits

- Specific information on energy saved was not available to either of the project contacts. However, Ms. Kernan stated that the Town saves approximately $36,000 per year on sludge hauling costs.

Project Cost/Benefit Calculations

- Assuming annual savings of $36,000 per year in hauling costs, the simple payback period of this loan is approximately 5 years.
- Absent specific information on energy savings, it is not possible to compute project cost/benefit calculations.

Prepared By: Jared Richardson (PG Environmental, LLC) on 10/1/2011

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
2 - New York City	NY	Village of Sackets Harbor	6020-05-70

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

WE - Water Efficiency

Other GPR Category:

GPR Subcategory: ME, EC, EP

Total SRF Loan Amount: $8,200,000

ARRA Loan Amount: $4,351,012

GPR Category Loan Amount: EE - $1,107,024

WE - $395,000

Principle Forgiveness Amount: $3,848,988

Loan Payback Period: 3 Years

General Project Description:

The Village of Sackets Harbor (Village) has undertaken a project to install a wireless water meter reading system at all of the Village's service connections.

Primary Environmental Benefits:

This project will reduce the occurrence of water leaks and potable water consumption within the Village.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Village of Sackets Harbor	Jim Yuhan, Treasurer	Phone: (315) 646-3548 E-mail:

Notes: Interviewed on 3/29/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

The Village owns and operates a water system which serves approximately 1,200 people and has approximately 800 service connections. Total annual potable water production and use is 110 million gallons or 0.3 MGD. Water meters were installed at all connections at varying times in the 1970's and 1980's. Meters move slower as they age, registering less flow than actually delivered. The Village commissioned a comprehensive water system evaluation by Stearns & Wheler in 2006. This study identified excessive unaccounted water within the village system. The total per capita production (203 GPD) was more than double typical water metered usage (80 to 100 GDP). This volume of unaccounted water was significant, approximating 45 million gallons per year.

This project involved the installation of wireless water meters at approximately 800 service connections and a radio read, fixed antenna continuous water meter reading system. Construction on the project was ongoing at the time of the interview, and was scheduled for completion in June 2012.

Project Components and Associated Costs:

The total project cost is anticipated to be between $320,000 and $330,000. Specific information on project components was unavailable to the project contact, Jim Yuhan, at the time of the interview.

- Approximately 800 water meters.
- Two master meters.

Project Benefits

- According to the project Business Case, the Village anticipates saving approximately 45 million gallons per year. Replacing the old meters which allow water to pass through without registering will increase water efficiency by decreasing the amount of water lost and by providing more accurate water-use information to customers and the system. The early detection of water leakage within residential plumbing through the continuous monitoring of the meters will be a factor in increasing water conservation awareness and water use behaviors.

Project Cost/Benefit Calculations

- The simple payback period of this could not be calculated.
- The expected water savings over a 20 year project life is approximately 564 gallons of water per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/30/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
2 - New York City	NY	Village of Speculator	5539-02-70

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: WR

Total SRF Loan Amount: $10,933

ARRA Loan Amount: $10,933

GPR Category Loan Amount: WE - $10,933

Principle Forgiveness Amount: $0

Loan Payback Period: 0 Years

General Project Description:

The Village of Speculator (Village) has purchased two cameras in order to undertake inspections of the Village's sanitary sewer lines, laterals, manholes and pump stations for the purpose of identifying and analyzing I/I.

Primary Environmental Benefits:

This project will reduce the quantity of I/I in the Village's collection system.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Speculator Information Newletter. Retrieved 2/21/2012. <http://www.lakepleasantny.org/forms/documents/Newsletter6.1.11.pdf>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

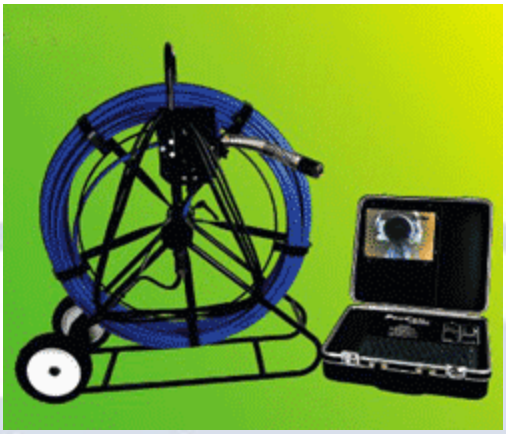
Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Village of Speculator	Florence Braunius, Plant Operator	Phone: (518) 548-5441 E-mail: specwwtp@frontiernet.net

Notes: Interviewed on 2/23/2012.

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:



ProCam Ultra (Source: http://www.municipalequipment.com/UEMSIpushcameras.html).

Project Narrative

The Village owns and operates a sanitary sewer system that conveys municipal sewage to the Village's wastewater treatment plant. The collection system is approximately six miles in length, includes five pump stations, and contains 322 service connections.

This project involves purchase of pipeline inspection equipment to allow the Village to inspect sewer lines, laterals, manholes, and pump stations. The resulting I/I analysis will help to identify leaking pipes and foster better maintenance, reducing water inflow and reducing energy usage for pumping and treatment. According to a recent rate analysis conducted by the Village, the system conveys an average of 30 MG per year—12 MG of which is attributable to I/I. Ms. Braunius indicated that the new equipment will be deployed in collection system inspections starting in April 2012.

Project Components and Associated Costs:

- One ProCam Ultra Push Camera System, manufactured by UEMSI ($8,210).
- One Telespector Pole Camera, manufactured by Rochester Industries, Inc. ($3,937).

Project Benefits

- The sewer line camera inspection equipment is a tool used in location and analysis of I/I. Identification of I/I will help to prevent groundwater sources from infiltrating the collection system, reduce hydraulic loadings on the wastewater treatment plant, and reduce energy consumption at the plant that would otherwise be used to treat I/I-derived flow.

Project Cost/Benefit Calculations

Since the inspection equipment had not been deployed for inspections at the time of her interview, Ms. Braunius indicated that specific, quantitative benefits info would be unavailable until late 2012 when inspections had been completed.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 3/2/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 6/20/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
2 - New York City	NY	Suffolk County Community College	9207-01-70

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: WF, WC

Total SRF Loan Amount: $675,000

ARRA Loan Amount: $675,000

GPR Category Loan Amount: WE - $675,000

Principle Forgiveness Amount: $0

Loan Payback Period: 0 Years

General Project Description:

The Suffolk County Community College (SCCC) proposes to improve both water and energy efficiency through installation of water saving appliances and fixtures throughout its campuses and energy efficient equipment at its wastewater treatment plant.

Primary Environmental Benefits:

This project will reduce SCCC's per student consumption of potable water.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful or relevant information was identified in the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Suffolk County Community College	Jon DeMaio, Administrative Director	Phone: (631) 451-4233 E-mail: demaioj@sunysuffolk.edu

Notes: Interviewed on 3/5/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

With more than 26,000 students enrolled on three campuses, SCCC is the largest community college in New York State. The three campuses—Ammerman Campus, Grant Campus, and Eastern Campus—provide teaching facilities for the student and faculty population and encompass over 100 buildings.

The SCCC undertook a project to improve energy efficiency and water efficiency at their facilities by installing new, high-efficiency equipment, sensors and fixtures at various campus locations. Water efficiency has been improved by installing sink sensors, urinal flush valves, toilet dual flush valves, and new low flush toilets at SCCC's Eastern, Ammerman, and Grant campuses. Energy efficiency efforts at the Ammerman Campus wastewater treatment plant included installation of VFDs in two aeration system blowers. Construction on this project started December 2009 and was completed August 2010.

Project Components and Associated Costs:

Water/Energy Conservation Units	Number of Units		
	Ammerman Campus	Grant Campus	Eastern Campus
Sink Sensors	179	207	69
Urinal Flush Valves	51	92	33
Toilet Dual Flush Valves	224	207	67
New Toilets	129	171	67
Variable Frequency Drives	2	0	0
Total	**$231,000**	**$272,000**	**$87,500**
Grand Total	**$570,500**		

Project Benefits

- The SCCC's Administrative Director, Jon DeMaio, was able to provide water savings information for the SCCC Eastern Campus which are likely to be representative of results at the other two campuses. Energy savings information from installation of the VFDs was not available to collect.

SCCC Eastern Campus			
Year	Campus Enrollment	Avg. Campus Flow (gpd)	Avg. Flow per Student (gpcd)
2004	2,796	4,390	1.57
2005	2,756	3,790	1.38
2006	2,854	3,823	1.34
2007	2,989	4,117	1.38
2008	3,222	3,810	1.18
2009	3,726	4,538	1.22
2010	3,852	2,881	0.75
2011	3,937	2,540	0.65
Per Capita Percent Reduction from 2009 to 2011:			**47**

Project Cost/Benefit Calculations

- The total project cost for the Eastern Campus was $87,500. The average per capita Eastern Campus flow was reduced by 0.57 GPCD between 2009 and 2011. Assuming enrollment were to stay constant at 2011 levels, this project will reduce water consumption by 188 gallons per dollar invested over the 20 year project life.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 3/13/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
2 - New York City	NY	Westchester County	7396-02-70

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC

Total SRF Loan Amount: $45,876,873

ARRA Loan Amount: $2,928,111

GPR Category Loan Amount: EE - $2,928,111

Principle Forgiveness Amount: $24,402,492

Loan Payback Period: 3 Years

General Project Description:

Westchester County (County) will make improvements to the Mamaroneck Wastewater Treatment Plant (Facility) in order to remove nitrogen from their effluent. As part of this project, energy efficiency enhancing equipment (e.g., automated oxygen controls and mechanical mixers with VFDs) is being installed at the Facility.

Primary Environmental Benefits:

Use of energy efficient equipment will reduce the energy use at the Facility. Installation of new nitrogen removal processes will reduce the quantity of nitrogen discharged to the Long Island Sound which is impaired for nitrogen.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Carlin Contracting Website. Retreived 2/14/2012. <http://www.carlincontracting.com/projects/detail/17/Wastewater-Treatment-Plant-Nitrogen-Removal-Improvements-Mamaroneck-NY>

Other Information Obtained ☒ **Yes** ☐ **No**

Sources: Energy Evaluation Memorandum: Mamaroneck Wastewater Treatment Plant, Westchester County (August 2009). New York State Energy and Research Development Authority.

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Westchester County Dept. of Environmental Facilities	Robert Giglo, Program Coordinator	Phone: (914) 813-5446 E-mail: rv1@westchestergov.com

Notes: Interviewed on 2/9/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Mamaroneck Wastewater Treatment Plant Aeration Tank (Source: http://www.carlincontracting.com/projects/detail/17/Wastewater-Treatment-Plant-Nitrogen-Removal-Improvements-Mamaroneck-NY)

Project Narrative

The County owns and operates four wastewater treatment plants (WWTP) which discharge into the Long Island Sound: Blind Brook WWTP, Mamaroneck WWTP, New Rochelle WWTP, and Port Arthur WWTP. The Long Island Sound is currently impaired for nutrients and has an active Total Maximum Daily Load (TMDL) for nitrogen. In 2008, Westchester County signed a consent decree which requires the County to make upgrades at their New Rochelle and Mamaroneck facilities in order to meet collectively applied nitrogen discharge limitations for the four facilities (i.e., a total nitrogen discharge limitation is applied to the collective discharge of all four of the facilities for discharges into the Long Island Sound). This project was undertaken to upgrade the Mamaroneck WWTP system's capacity to remove nitrogen.

The project involves modifying and upgrading the existing liquid treatment train to remove nitrogen using nitrification and denitrification processes at the Mamaroneck WWTP. Specifically, the County will install an Integrated Fixed Film Activated Sludge (IFAS) system. IFAS is a hybrid treatment system which combines biomass generated in suspended growth processes (i.e., typical activated sludge systems) with fixed-film biomass grown on plastic media introduced to the aeration tanks. The Facility will receive a retrofit to six existing aeration basins to incorporate IFAS process modifications. Automated dissolved oxygen controls will be installed; baffles will be installed to create aerobic and anoxic zones for nitrification and post-anoxic zones for denitrification; plastic IFAS media will be introduced into the basins which will provide surface area for fixed-film microorganism growth, and a methanol-feed system to provide chemical energy to drive denitrification will be installed. The GPR component of the loan was used to purchase and install an automated dissolved oxygen control loop and mechanical mixers with VFDs for the post-anoxic zones. Construction on the project began in December 2009 and completion is scheduled for September 2012.

Project Components and Associated Costs:

- Dissolved Oxygen Control Loop ($65,122);
- IFAS Post-Anoxic Zone Mechanical Mixers ($2,862,989).

Project Benefits

Construction on the project is not scheduled for completion until September 2012, consequently, quantified benefits information is not available. However, the New York State Energy Research and Development Authority (NYSERDA) has developed an estimate of expected energy savings from the project in an August 2009 memorandum. Energy savings estimates developed from the NYSERDA memorandum are utilized below.

- The use of an automated dissolved oxygen control system will allow Mamaroneck WWTP operators to more efficiently utilize the system's blowers and reduce blower operation time. Reduced blower use will result in reduced electricity consumption by the system. Estimated electricity savings due to use of the automated dissolved oxygen controls are 3,331,489 kWh/yr. At an average historical price rate of $0.10 per kWh for the Mamaroneck WWTP, this electricity savings is estimated to be worth approximately $333,000 per year.
- Estimated electricity savings due to use of the IFAS post-anoxic zone mechanical mixers with VFDs 264,951 kWh/yr. At an average historical price rate of $0.10 per kW-hr for the Mamaroneck WWTP, this electricity savings is estimated to be worth approximately $26,500 per year.
- Installing a system for total nitrogen removal will improve water quality in Long Island Sound by reducing the frequency and severity of hypoxia events.

Project Cost/Benefit Calculations

Based on a total annual energy savings of 3,596,440 kWh, worth approximately $359,500, the payback period for the GPR component of the loan is estimated to be approximately eight years.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 2/17/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/20/2012

GPR Technical Project Information Reports

EPA REGION 3

Maryland

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
3 - Philadelphia	MD	Talbot County	WW1106

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: SO, WI

Total SRF Loan Amount: $3,800,000

ARRA Loan Amount: $3,800,000

GPR Category Loan Amount: EE - $3,800,000

Principle Forgiveness Amount: $0

Loan Payback Period: 0 Years

General Project Description:

Talbot County (County) has undertaken a project to increase renewable energy production at the County's Wastewater Recycling Facility (Facility). Specifically, this project involved the installation of wind turbines and a solar panel array at the Facility.

Primary Environmental Benefits:

The power generated from the wind turbines and solar cells will be used to off-set energy demand at the Facility. Energy produced in excess of Facility demand will be sold to other users.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Star Democrat News. Retreived 2/15/2012. <http://www.stardem.com/image_29286560-432d-11e0-88b5-001cc4c03286.html>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Talbot County	Ray Clarke, County Engineer	Phone: (410) 770-8170 E-mail: rclarke@talbotcountymd.gov

Notes: Interviewed on 2/15/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Wind Turbines and Solar Panels (Source: http://www.stardem.com/image_29286560-432d-11e0-88b5-001cc4c03286.html).

Project Narrative

The County owns and operates the Facility which provides solids and wastewater management services to both the County and neighboring Caroline County by treating and disposing of septage and grease. In the future, the County plans to utilize the Facility as a regional service provider for receiving, treating, and disposal of grease and septage from the 16,000 residential and commercial septic systems located in the Midshore Region of Maryland.

The County has developed a sustainable energy strategy which is being implemented at the Facility. As part of this strategy, the County undertook this project in order to augment their existing biogas energy production capacity with new wind and solar power production units. This involved the installation of three 100 kW wind turbines and an array of solar panels capable of generating 300 kW of power—resulting in a combined wind and solar power production capacity of 600 kW. The County plans to use the new power generation capacity to off-set energy use at the Facility and to generate new revenue via the sale of renewable energy credits through the Maryland Energy Administration and direct sale of electricity on the grid. Construction on this project was completed in two phases: all three wind turbines were completed in June 2011 and the solar panels were completed in July 2011.

Project Components and Associated Costs:

- Three Northwind 100, 100 kW, low-profile wind turbines manufactured by Northern Power Systems, and three towers manufactured by Saber Communication ($1,100,000).
- An array of approximately 4,800 GE200 photovoltaic panels manufactured by General Electric ($2,700,000).

Project Benefits

- Increased use of renewable energy will reduce the Facility's carbon footprint.
- According to Mr. Clarke, the Facility generated 118,000 kWh of electricity from the wind turbines during the period between April 2011 to December 2011. The solar cells generated 298,690 kWh during the period July 2011 to December 2011.
- Based on power production data from 2011, Mr. Clarke projects that the Facility will generate $60,000 per year via sale of renewable energy credits and $30,000 per year from the direct sale of electricity. Mr. Clarke noted that revenue was projected using early operational data which included a period when the wind turbines were operated below optimum efficiencies due to a software error and that power production may increase as these inefficiencies are identified and remedied. These revenues will be used to finance Facility operations and reduce seasonal volatility in end-user service rates.

Project Cost/Benefit Calculations

- Assuming annual revenues of $90,000 from the project, the payback period for the $3,800,000 loan will exceed the 20 year service life of the project.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 2/15/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25/2012

GPR Technical Project Information Reports

EPA REGION 3

Virginia

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
3 - Philadelphia	VA	City of Covington	VCWSTG512

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: GP

Total SRF Loan Amount: $356,914

ARRA Loan Amount: $356,914

GPR Category Loan Amount: EE - $356,914

Principle Forgiveness Amount: $356,914

Loan Payback Period: 20 Years

General Project Description:

The scope of the project is the installation of one 30 kW microturbine to convert excess methane gas from the City of Covington (City) Wastewater Treatment Plant's (Facility) anaerobic digester into electricity to offset electricity use from the power grid.

Primary Environmental Benefits:

The project will offset electric usage from the power grid, which will improve Facility energy efficiency and improve air quality.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☒ **Yes** ☐ **No**

Sources: City of Covington Wastewater Treatment Plant NPDES Permit No. VA0025542

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Clough Harbor & Associates	Greg Schultz, Engineer	Phone: (540) 552-2012 E-mail: gschultz@chacompanies.com

Notes: Interviewed on 1/25/2012

Entity	Contact Name and Title	Contact Phone Number / Email
Clough Harbor & Associates	Shawn Veltman, Engineer	Phone: (540) 552-2012 E-mail: sveltman@chacompanies.com

Notes: Interviewed on 3/5/2012

Project Narrative

The Facility has an average daily design flow of 3 MGD. Solids are separated from the liquid treatment train at primary and secondary clarifiers and fed to an anaerobic digester. Digester effluent is dewatered by centrifugation and stabilized in sludge drying beds. The stabilized sludge is hauled to a landfill for disposal.

The purpose of the project is to harvest methane gas from the anaerobic digester and convert it into electricity which can be used at the Facility. Specifically, this involved the installation of one 43 kW microturbine to convert excess methane gas from the Facility's anaerobic digester into electricity. Power generated on site will be used in place of power purchased from the electrical grid. The construction timeline for this project was not available.

Project Components and Associated Costs:

The total project cost was approximately $357,000. Itemized project component costs were not available to the project representatives at the times of their interviews.

- One FleXgen G43 combined Stirling Engine.
- One 43 kW Generator.

Project Benefits

- Renewable electricity is generated from methane gas harvested from the anaerobic digester. Quantitative benefits data or design estimates were not available during interviews and subsequent follow-up contacts with the project contacts.

Project Cost/Benefit Calculations

- On-site electricity is generated from harvested anaerobic digester produced methane gas.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/17/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
3 - Philadelphia	VA	Fairfax County	VCWSTG504

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: RE

Total SRF Loan Amount: $6,500,000

ARRA Loan Amount: $6,500,000

GPR Category Loan Amount: WE - $6,500,000

Principle Forgiveness Amount: $6,500,000

Loan Payback Period: 20 Years

General Project Description:

The scope of this project is the construction of water reuse pumping facilities at the Fairfax County (County) Norman M. Cole, Jr., Pollution Control Plant (Facility). Specifically, this entails the construction of three vertical turbine pumps, 15,000 ft of force main, and 400 ft of gravity sewer. Water reuse customers will purchase the recycled water in place of potable water.

Primary Environmental Benefits:

This project will reduce the quantity of potable water used by the recycled water end-users, will reduce the quantity of effluent disposed by Fairfax County within the Chesapeake Bay watershed, and will reduce the quantity of nutrients discharged to the Chesapeake Bay.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Fairfax County Water Reuse Project Website. Retrieved on 1/17/2012. <http://www.fairfaxcounty.gov/dpwes/wastewater/water_reuse/>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

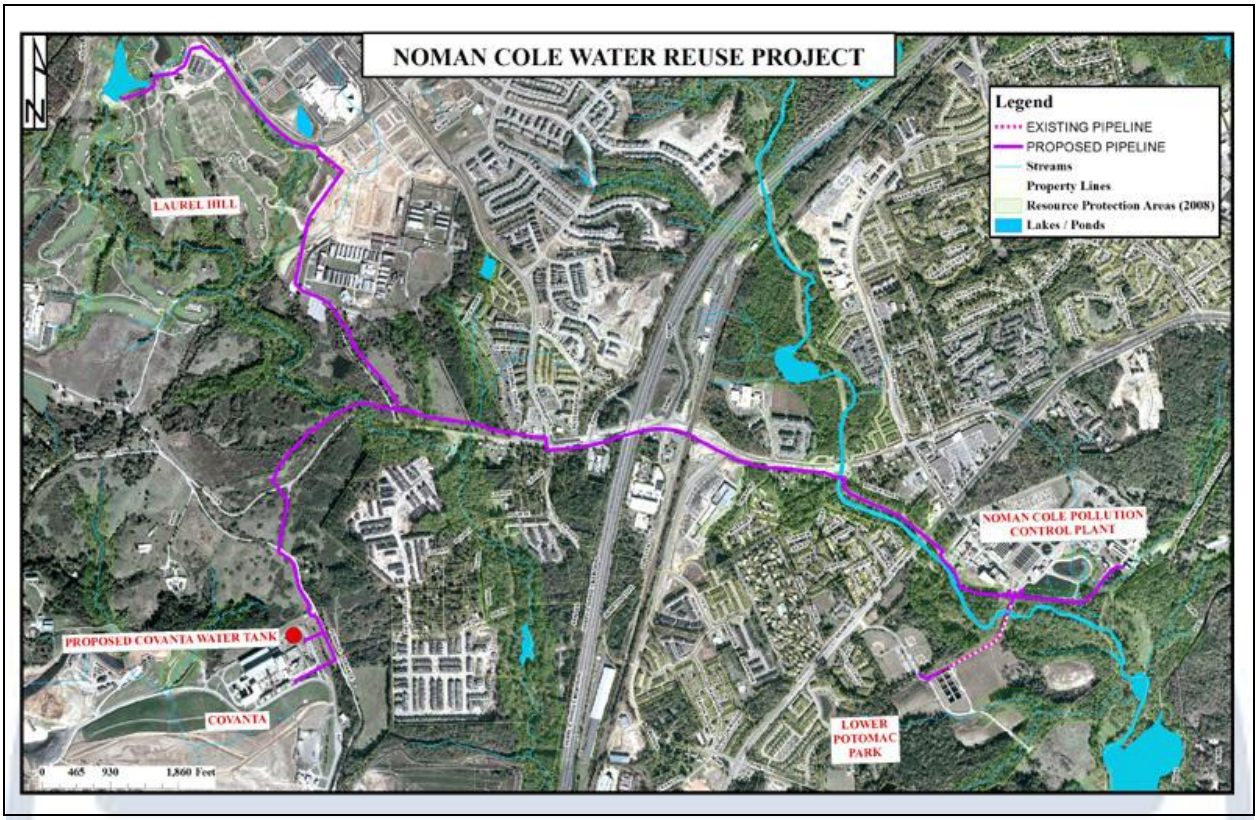
Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Fairfax County, Wastewater Planning and Monitoring Division	Shahram Mohsenin, Director	Phone: (703) 324-5026 E-mail:

Notes: Interviewed on 1/17/2012

Entity	Contact Name and Title	Contact Phone Number / Email
Fairfax County, Wastewater Planning and Monitoring Division	Anthony Knizner, Fairfax County	Phone: (703) 324-5117 E-mail:

Notes: Interviewed on 2/14/2007



Water Reuse Project Distribution System (Source: http://www.virginiaplaces.org/waste/reuse.html).

Project Narrative

The Facility is a 45 MGD wastewater treatment plant capable of producing high-quality effluent which meets standards for use as recycled water. The Facility's treatment train includes mechanical screening, primary sedimentation, extended aeration with polymer addition, secondary sedimentation, filtration, chlorination, and dechlorination. The purpose of this project is the construction of water reuse pumping capabilities at the Facility which will be used to distribute recycled water to users within the County.

The project entails the installation of pumps to distribute recycled water, 15,000 ft of force main, and 400 ft of gravity sewer. The force main and gravity distribution will connect the Facility to water reuse customers in Fairfax County. The County's primary water reuse customer is Covanta Fairfax, Inc. (Covanta), owner of the Resource Recovery Plant. Covanta has contracted to purchase 1.5 MGD of recycled water produced from the Facility. The County also expects to develop contracts with other water reuse customers, including the Laurel Hill Golf Course, Fort Belvoir, and other sites within Fairfax County. The representative for the County, Mr. Mohsenin, indicated that this project was conceived a number of years ago and shelved due to an absence of available funding and would not have been feasible without the funding made available through this program. Construction on the project began in January 2010 and the system is expected to be completed and begin operations in April 2012.

Project Components and Associated Costs:

According to Mr. Mohsenin and Mr. Knizner the project components include the following elements:

- Two 450 hp pumps manufactured by Weir-Floway, Inc.
- One 60 hp inline booster pump manufactured by Simflo Pumps.
- 15,000 ft of ductile iron force main with diameters of 36 inches, 20 inches, and 12 inches (according to Mr. Knizner, the majority of the pipeline is 20 inch ductile iron pipe);
- 400 ft of ductile iron pipe gravity sewer.

Project Benefits

- The County's recycled water customers will use the reclaimed water in place of potable water which reduces demand on the County's potable water sources. Covanta will use 1.5 MGD of recycled water rather than potable water.
- The project reduces the amount of nutrients that are discharged to the Chesapeake Bay, like phosphorous and nitrogen. Mr. Mohsenin stated that the residual nitrogen (1.3 mg/L as N) and phosphorus (0.18 mg/L as P) in the recycled water will be prevented from discharging to Chesapeake Bay, which is impaired for nutrients.

Project Cost/Benefit Calculations

- Mr. Mohsenin has the opinion that the project will pay for itself in 20 years based on projected revenue from Covanta. Revenues from the County's other customers will further reduce the project payback period. In the long run, the county will earn money from selling reclaimed water, helping to offset other costs associated with services provided by the County. The County will sell recycled water to Covanta at approximately 75 percent the cost of potable water.
- The use of recycled water by Covanta alone will further reduce nitrogen and phosphorus discharges to Chesapeake Bay by 6,000 lbs/yr and 800 lbs/yr, respectively. This estimate is based on a projected recycled water demand of 1.5 MGD and the residual nitrogen and phosphorus concentrations discussed above.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 1/30/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25/2013

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
3 - Philadelphia	VA	New Kent County	VCWSTG502

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: RE

Total SRF Loan Amount: $3,917,753

ARRA Loan Amount: $3,917,753

GPR Category Loan Amount: WE - $3,917,753

Principle Forgiveness Amount: $3,917,953

Loan Payback Period: 20 Years

General Project Description:

The project involved the construction of 10.5 miles of new 24-inch force main to transport treated effluent from the Parham Landing Treatment Plant to end users of reclaimed water. The reclaimed water will be used by the end user in place of potable groundwater. Reclaimed water will be used for irrigation and dust control.

Primary Environmental Benefits:

The project will allow the use of Parham Landing reclaimed water in place of potable water for irrigation in the County. The water will be reclaimed thereby reducing discharge of effluent to the Pamunkey River.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Chesapeake Bay Program. Retrieved: 1/16/2011. <http://www.deq.state.va.us/bay/wqif/New_Kent_Co._Parham_Landing>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
New Kent County	Larry Dame, Director of Public Utilities	Phone: (804) 966-9678 E-mail:

Notes: Interviewed on 1/30/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Recycled Water Distribution Manifold (Source: New Kent County).

Project Narrative

New Kent County (County) currently operates two wastewater treatment facilities: the New Kent County-Parham Landing Wastewater Treatment Plant (NKCPL) which discharges into the Pamunkey River and the Chickahominy Wastewater Treatment Plant (CWTP) which discharges into the James River. Both rivers are tributaries to Chesapeake Bay. The County has elected to expand the NKCPL from a design flow of 0.568 MGD to a design capacity of 2.0 MGD and close the CWTP. The County will treat all its wastewater at the NKCPL. The CWTP will instead be used to store and distribute 0.25 MGD to 0.30 MGD of tertiary effluent to three recycled water purchasers (two golf courses and a race track). The purchased recycled water would be used by the customers in place of groundwater. In addition, the use of recycled water will reduce nutrient discharges to the Chesapeake Bay which is impaired for nutrients. Construction on the project began in November 2009 and was completed in October 2011.

Project Components and Associated Costs:

- 10.5 miles of 24-inch force main.
- One 300,000 gallon steel storage tank.
- Two pumps were installed at the Reclaimed Facility which distribute the reclaimed water and send it to reject should the water not pass testing. The pumps are constant speed, centrifugal pumps manufactured by Flygt NP 3153.181, 15 horsepower, 464 Impeller Code.
- One SCADA system.

Project Benefits

- According to agreements reached by the County and their recycled water customers, between 0.25 MGD and 0.30 MGD of flow is currently being pumped to customers, rather than being discharged to surface receiving waters. This recycled water use also displaces potable water use by the recycled water customers.
- The Chesapeake Bay is currently listed as impaired for nutrients. By reducing the quantity of water discharged into the Chesapeake Bay watershed, the County is reducing nutrient loadings into the Chesapeake Bay.

Project Cost/Benefit Calculations

- According to Mr. Dame, the County currently sells recycled water at a rate of $0.75 per 1,000 gallons. In their first two months of operation, the County generated $12,000 in revenue from recycled water sales. With $72,000 in revenue annually, the payback period of this loan exceeds a 20 year project life.
- Assuming effluent nitrogen and phosphorus concentrations equal to their current permitted effluent limitations (6 mg/L as nitrogen and 0.4 mg/L as phosphorus, respectively) and daily recycled water flows of 0.25 MGD, the County is reducing its nutrient discharges to the Chesapeake Bay by 13 pounds per day of nitrogen and 0.83 pounds per day of phosphorus.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 2/10/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
3 - Philadelphia	VA	Town of Abingdon	VCWSTG508

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: GP, SO

Total SRF Loan Amount: $565,000

ARRA Loan Amount: $565,000

GPR Category Loan Amount: EE - $565,000

Principle Forgiveness Amount: $565,000

Loan Payback Period: 20 Years

General Project Description:

The purpose of this project is to furnish and install two energy recovery microturbines, geothermal heat pumps, solar panels, and associated equipment to convert digester methane gas to electricity at the Town of Abingdon's (Town) Wolf Creek Water Reclamation Facility (Facility).

Primary Environmental Benefits:

This project will permit the Town to harvest energy from wastewater treatment processes at the Facility and reduce the quantity of electricity purchased by the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Water Environment Federation - Plant Profile. Retreived on 2/21/2012. <http://www.wef.org/publications/page_wet.aspx?id=8505&page=plant>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Town of Abingdon	Mike Maiden, Facility Manager	Phone: (276) 628-4321 E-mail: mmaiden@abingdon-va.gov

Notes: Interviewed on 2/14/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Wolf Creek Water Reclamation Facility (Source: Town of Abingdon).

Project Narrative

The Facility has a design treatment capacity of 4.95 MGD. The Facility's treatment train consists of two primary settling tanks, two activated sludge treatment units (each composed of an aerated and anoxic cell), secondary clarifiers, tertiary filters, and ultraviolet disinfection. After disinfection, effluent passes through a cascade aerator and is discharged to Wolf Creek. Solids collected from the liquid treatment train are processed in an anaerobic digester.

The scope of this project is to improve the energy efficiency of the Facility by installing several renewable energy production units and energy efficient improvements. These included the installation of a system to generate heat and electricity from digester gas cogeneration, installation of a small solar array, installation of a geothermal heating and cooling system, and installation of an energy management system. The new systems began operation in June 2011.

The existing biogas recovery and utilization system burns recovered methane gas to heat the digester sludge. The upgrades to this system involved the installation of two 30 kW generators to produce electrical power and to capture the exhaust heat. Methane gas production from the digesters in 2009 was in excess of 7.2 million cubic feet. The system upgrade also included the replacement of the two existing air exchange heat pumps with two geothermal heat pumps. The geothermal pumps are used to heat and cool the Facility's Administration building. Additional upgrades included installation of a small solar array and an energy management system. The two kW, grid-connected solar array is the first phase in a project to build a more substantial solar energy production capacity at the Facility. Mr. Maiden indicated that the new array is too small to make a significant impact on electricity expenditures, the Town plans to incrementally increase solar capacity at the Facility on an annual basis as money becomes available. The energy management system provides daily energy usage reports and is being used to identify opportunities to reduce energy waste and manage system use to reduce surcharges on electricity used during peak demand periods.

Project Components and Associated Costs:

- Two 30 kW Capstone C30 microturbine generators manufactured by Capstone Turbine Corporation and one biogas cleanup skid manufactured by Pioneer Air Systems ($412,455).
- Two Geocomfort Compass Series geothermal heat pumps manufactured by Enertech Global, LLC ($18,600).
- One two kW, grid connected photovoltaic solar array manufactured by Schott Solar PV, Inc ($32,800).
- Power management equipment and generator control system ($86,975).

Project Benefits

- The system will reduce the carbon footprint of the Facility by reducing the quantity of electricity purchased from the grid. According to utility billing summaries provided by Mr. Maiden, average daily electrical purchases from the grid during the post-construction period were 4,632 kWh per day. This represents a 12 percent reduction from the pre-construction period (5,251 kWh per day). Based on the available data, the project reduced electricity demand at the Facility by a daily average of 616 kWh.

Project Cost/Benefit Calculations

- According to Mr. Maiden, electricity purchases for the Facility cost approximately $0.11 per kWh. Assuming this price and approximate annual electricity saving of 767,000 computed from the daily average, the Town will save approximately $24,800 per year.
- Assuming an energy savings of $24,800 per year, the project will have a payback period of approximately 22 years.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 2/21/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/20/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
3 - Philadelphia	VA	Town of Culpeper	VCWSTG511

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: GP

Total SRF Loan Amount: $246,310

ARRA Loan Amount: $246,310

GPR Category Loan Amount: EE - $246,310

Principle Forgiveness Amount: $246,310

Loan Payback Period: 20 Years

General Project Description:

The Town of Culpeper (Town) upgraded the Culpeper Water Pollution Control Facility (Facility) boilers from a fuel oil burning process to a process which uses methane harvested from the Facility's digester process. These modifications involved installing new piping to transport the gas from the digester to the boiler, a new burner and gas ignition system, and operation controls.

Primary Environmental Benefits:

Capturing and utilizing methane from the Facility's digester will reduce fuel oil consumption and will use a renewable energy source.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Town of Culpeper NPDES Permit No. VA0061590.

Other Information Obtained ☒ **Yes** ☐ **No**

Sources: ARRA Site Inspection Report, Inspection No. ARRA 201-1, Inpection Conducted on 10/12/2011.

Contact Information:

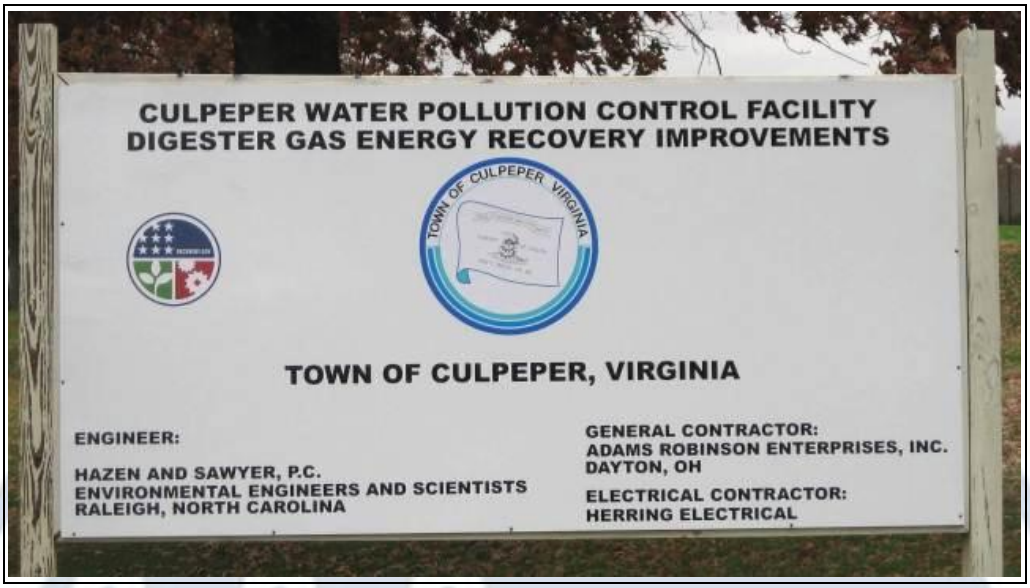
Entity	Contact Name and Title	Contact Phone Number / Email
Chris Hively, Town of Culpeper	Chris Hively, Environmental Services Director	Phone: (540) 829-8280 E-mail: CHively@culpeperva.gov

Notes: Interviewed on January 24, 2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.



Facility signage displaying the ARRA logo during active construction
(Source; Town of Culpeper)

Project Narrative

The purpose of this project is to modify the solids handling system in order to reduce Facility's reliance on fuel oil. Prior to the Facility upgrades, the digesters were heated using a boiler operated with fuel oil. The Facility upgrades entailed modifying the digester and boiler to permit capturing waste methane from the digesters and using it to fuel the boilers. According to documentation provided by Mr. Hively, construction on the project was completed in 2010.

Project Components and Associated Costs:

- Vaqrec Biogas gas burner system (Model No. VB2350800; $75,398).
- 220 feet of ductwork ($12,380).
- 60 ft of HDPE pipe with pipe insulation ($4,772).
- Two HDPE flanges ($180).
- One waste gas burner and ignition system ($8,830).
- W.C. Rouse & Son, Inc., Plant Wide Controller Two Boiler Hot Water Modulating Lead/Lag Controller ($25,560).

Project Benefits

- The Facility is able to operate their boilers using energy generated from an on-site source rather than relying on fuel oil purchases. This saves energy and reduces the Facility's carbon footprint.

Project Cost/Benefit Calculations

- According to Mr. Hively, the Facility reduced its fuel oil consumption by 29,899 gallons in the 2010 fiscal year relative to the 2008 fiscal year. Assuming a fuel oil price of $3.154 per gallon and an annual fuel oil consumption reduction of approximately 30,000 gallons, the annual savings due to the energy efficiency improvements to be approximately $94,000 per year.
- Given an annual fuel oil savings of $94,000 per year, the loan payback period will be less than three years.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 2/9/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
3 - Philadelphia	VA	Town of Warrenton	VCWSTG509

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: GP

Total SRF Loan Amount: $542,000

ARRA Loan Amount: $542,000

GPR Category Loan Amount: EE - $542,000

Principle Forgiveness Amount: $542,000

Loan Payback Period: 20 Years

General Project Description:

The Town of Warrenton (Town) Warrenton Sewage Plant (Facility) will replace their current digester covers with larger floating covers to collect and store methane. The methane will be used as a fuel to heat the digesters. The project will require the installation of a digester cover over one of the anaerobic digesters, a gas flow regulator, steel piping, and electronic controls.

Primary Environmental Benefits:

This project will reduce the quantity of heating oil used by the Facility to heat the anaerobic digesters. This will improve the energy efficiency of the Facility and reduce its carbon footprint.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources:

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Town of Warrenton	Ed Tucker, Public Works Director	Phone: (540) 347-6574 E-mail:

Notes: Interviewed on 1/24/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

The Facility serves a population of approximately 11,160 people. Treatment at the Facility consist of mechanical bar screens, five primary clarifiers, a trickling filter, three trains of seven RBC units, two secondary clarifiers, and chlorine disinfection. Treated effluent is discharged to the Great Run River. The sludge treatment train consists of gravity thickeners, two anaerobic digesters, and belt press dewatering.

The scope of this project is to replace the Facility's current digester covers with larger floating covers to collect and store methane. The methane will be used as a fuel to heat the digesters. The existing system flares the methane gas. The project will require the installation of a digester cover over one of the anaerobic digesters, a gas flow regulator, steel piping, and electronic controls.

Project Components and Associated Costs:

- The existing digester covers will be replaced with floating digester covers.
- A new flow regulator will be installed with electronic controls.

Project Benefits

- The Town projects that harvesting methane from anaerobic digester will reduce costs associated with purchasing fuel oil by $10,000 to $15,000 per year.
- A secondary benefit of the project is that covering the anaerobic digester will reduce odor produced by the digester.

Project Cost/Benefit Calculations

- Assuming an annual savings of $15,000 per year for purchased fuel, the payback period of this loan exceeds a 20 year project life.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 1/25/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/20/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
3 - Philadelphia	VA	Westmoreland County	VCWSTG505

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: RE

Total SRF Loan Amount: $890,000

ARRA Loan Amount: $890,000

GPR Category Loan Amount: WE - $890,000

Principle Forgiveness Amount: $890,000

Loan Payback Period: 20 Years

General Project Description:

The Westmoreland County (County) Coles Point Wastewater Treatment Plant (Facility) uses spray irrigation land disposal for disposal of final effluent. This project involved the construction of one 3 million gallon (MG) effluent storage tank, one chlorine mixer, and distribution force main which will allow the County to operate six disposal fields per day. Previously, the Facility's disposal capacity was limited to the use of a maximum of three disposal fields per day.

Primary Environmental Benefits:

The additional storage and spraying capacity provided by the project reduces the quantity of water that must be pumped and hauled to alternate disposal sites during wet weather (i.e., high flow) conditions. The increased disposal capacity will permit the Facility to provide service for an additional 450 customers, who are currently using on-site septic systems to treat and dispose of wastewater, and produce additional hay for sale.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: County Board of Supervisors Meeting Minutes, August 10, 2009. Retreived 1/18/2012. <http://www.westmoreland-county.org/assets/meetings/2009_08_10.pdf>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Westmoreland County	Norm Risavi, County Administrator	Phone: (804) 493-0130 E-mail:

Notes: Interviewed on 1/17/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Facility Spray Irrigation Effluent Disposal Site (Source; Westmoreland County).

Project Narrative

The Facility uses six spray irrigation fields for disposal of their final effluent. The Facility is not permitted to discharge effluent to a receiving water so any effluent which exceeds their land disposal capacity must be hauled by truck to a neighboring wastewater treatment plant to be retreated and disposed. The existing system has two two-MG storage tanks and a single force main distribution line to the irrigation fields. The irrigation fields are seeded with reed canary grass (*Phalaris arundinacea*) which is harvested periodically and sold as hay. The Facility's land disposal capacity is limited by the irrigation fields' capacity to infiltrate effluent (i.e., the Facility is limited by permit to an application rate of no more than 1 inch per day of combined effluent and rainfall) and because they have a single force main for distributing effluent to the fields that limits distribution capacity.

The purpose of this project was to increase the land disposal capacity of the Facility by constructing a new, concrete lined 3 MG rolled steel storage tank, one 10 MG per minute (MG/min) chlorine mixer (the applied effluent must meet a residual chlorine requirement), and a second distribution force main which will allow the County to operate six disposal fields per day. Previously, only three fields per day could be effectively utilized. The addition of a second force main effectively doubles the Facility's land disposal capacity. The additional storage tank allows the Facility to store more effluent during periods of extended rainfall when the infiltration capacity of the irrigation fields are reduced.

Project Components and Associated Costs:

- One three MG concrete lined, rolled steel effluent storage tank.
- One 10 MG/min chlorine mixer.
- Additional force main distribution from the storage tanks to the irrigation fields (note that the existing pumping capacity was adequate to supply the increased pump demand from the installation of the second force main).

Project Benefits

- The Facility is able to dispose more effluent on-site and is much less reliant on loading and hauling their effluent to other wastewater treatment plants for disposal.
- The increase in disposal capacity will allow the Facility to provide treatment and disposal services to an additional 450 customers within the County who are currently treating and disposing of wastewater using on-site septic systems.
- Mr. Risavi indicated that he expects that the project will result in increased hay production at the irrigation fields.
- Mr. Risavi also noted that the additional spraying capacity has reduced costs at the Facility by reducing the need for overtime labor expenses. Previously, operations could continue 24 hours per day in order to meet disposal needs.

Project Cost/Benefit Calculations

- Mr. Risavi estimated that this project reduced the quantity of effluent hauled off-site for disposal by approximately three MG in 2011 and saved the County between $160,000 and $170,000 in hauling costs. With $170,000 in annual savings, the payback period on the load is 5 years.
- According to Mr. Risavi, the increased disposal capacity provided by the project will increase overall capacity to the Facility. Because capacity has been increased, 450 new customers have been identified and if they were to initiate service, revenues could increase by $141/customer/month or $761,400 per year.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 1/19/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 1/23/2012

GPR Technical Project Information Reports

EPA REGION 3

West Virginia

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
3 - Philadelphia	WV	City of Lewisburg	C-547400

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: ME

Total SRF Loan Amount: $1,982,850

ARRA Loan Amount: $1,982,850

GPR Category Loan Amount: WE - $1,982,850

Principle Forgiveness Amount: $1,982,850

Loan Payback Period: 10 Years

General Project Description:

The City of Lewisburg (City) purchased and installed 4,486 new water meters with wireless data transmitters and three radio transmission towers. These meters can be read remotely.

Primary Environmental Benefits:

The installation of meters allows the City to charge water and sewer users based on the quantity of service utilized, rather than a flat access fee, which will increase the efficiency of water use and disposal by service users.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Chapman Technical Group	Kennon Chambers, Project Manager	Phone: (304) 727-5501 E-mail: kchambers@chaptech.com

Notes: Interviewed on 4/16/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

10-inch Diameter AccuMAG Water Meter (Source: http://www.sensus.com/web/usca/water/product-line/commercial-water-metrology/product/accumag-meters).

Project Narrative

The City has a service area with 7,722 service connections. This project involved installing water meters at each service connection with wireless data transmission capabilities. Previously, these connections had been unmetered and the City charged a flat service fee for water and sewer use. With the new meters, the City will instead charge users based on usage rates which incentivizes efficient water use by end users. The meters are equipped with wireless transmitters which send meter data to the City's automated billing software via three radio signal relay towers constructed as part of the project. The project contact, Kennon Chambers, commented that the loan was very helpful to the City and the new system will serve as a model for other cities in the region considering automated meter systems. Construction on the project is currently underway and is scheduled for completion in September 2012.

Project Components and Associated Costs:

The total project cost was approximately $1,982,000. An itemized list of project components are as follows:

- Four thousand three hundred and sixteen 5/8-inch diameter water meters ($146 per meter).
- Fifty six 1-inch diameter water meters ($215 per meter).
- Twelve 1.5-inch diameter water meters ($434 per meter).
- One hundred and one 2-inch diameter water meters ($582 per meter).
- One 4-inch diameter water meter ($2,308 per meter).
- One 10-inch diameter AccuMAG meter ($12,542 per meter).
- Four thousand three hundred and eighty seven pit-mounted meter interface units (MIU; $138 per unit).
- One hundred wall-mounted MIU ($143 per unit).
- Four thousand three hundred and eighty seven meter covers ($210,000).
- Fixed base AMR system including three transmission towers ($290,500).

Project Benefits

- Water savings data is not available since the project is still under construction. According to the CWSRF Benefits Reporting information, the City is anticipating reducing water losses in the system by 41.8 percent and the Business Case states that 46,642,000 gallons of water will be saved per year.
- The Business Case states that the City anticipates saving 576 gallons of gasoline per year from reduced meter reader transportation costs and approximately $129,000 per year in other related costs.

Project Cost/Benefit Calculations

- Based on anticipated annual cost savings of $129,000 per year, the simple payback period of the loan is 15 years.
- Over a twenty year project life, the anticipated savings are approximately 471 gallons of water per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/1/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/20/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
3 - Philadelphia	WV	Corporation of Shepherdstown, West Virginia	C-547450

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $375,772

ARRA Loan Amount: $375,772

GPR Category Loan Amount: EE - $375,772

Principle Forgiveness Amount: $375,772

Loan Payback Period: 10 Years

General Project Description:

The Corporation of Shepherdstown (Corporation) has undertaken a project to retire a pump station located in the collection system from service and to install a new gravity sewer line.

Primary Environmental Benefits:

This project will reduce electricity consumption in the Corporation's collection system.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: The Shepherdstown Chronicle. Retrieved 6/30/2012. <http://www.shepherdstownchronicle.com/page/content.detail/id/500723/Our-Shepherdstown-project-updates.html?nav=5088>.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Chapman Technical Group, Inc.	Jeff Ekstrom, Engineer	Phone: (304) 727-5501 E-mail: jekstrom@chaptech.com

Notes: Interviewed on 4/17/2012

Installation of Gravity Sewer and Manhole (Source: Corporation of Shepherdstown).

Project Narrative

The Corporation has undertaken a project to remove the Lowes Pump Station (PS) from the Corporation's collection system and to replace it with a new gravity sewer line. The PS is located in the southwest portion of the collection system which conveys sewage to the Stewart Wastewater Treatment Plant for approximately 1,800 people. This population consists of 130 service connections, one hotel, and one school. The Corporation anticipates adding approximately 1,000 people to this section of the service area. The PS has aged beyond its useful life and is being retired from service rather than being replaced. Construction on this project began in March 2010 and was completed in July 2010.

Project Components and Associated Costs:

The total project cost was approximately $226,000. Information on itemized costs was not available. An itemized list of the project components are as follows:

- Removed and replaced 2,100 feet of 8-inch diameter PVC pipe.
- Removed 146 feet of 10-inch diameter PVC pipe and replaced this 12-inch diameter PVC pipe.
- Installed 970 feet of 12-inch diameter PVC pipe.
- Installed 1,500 feet of 8-inch diameter PVC pipe.
- Installed nine manholes.

Project Benefits

- According to the project contact, Jeff Ekstrom, the PS consumed approximately 2,800 kWh per year of electricity which possessed a cash value of $290.
- Estimated total savings, including anticipated additional electricity consumption due to new development, was calculated at approximately 6,800 kWh per year and valued at $700, as per Mr. Ekstrom and the Business Case. This electricity savings is anticipated to reduce carbon emissions by approximately 4,900 metric tons of carbon dioxide per year.

Project Cost/Benefit Calculations

- Based on an anticipated savings of approximately $700 per year, the simple payback period for this loan exceeds a 20 year project life.
- Over a 20 year project life, this project is anticipated to save approximately 0.36 kWh of electricity per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/30/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

GPR Technical Project Information Reports

EPA REGION 4

Alabama

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
4 - Atlanta	AL	Childersburg Water Works, Sewer & Gas Board	CS010832-01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: ER, EC

Total SRF Loan Amount: $8,149,180

ARRA Loan Amount: $6,880,808

GPR Category Loan Amount: EE - $291,451

GI - $2,793,075

Principle Forgiveness Amount: $3,584,179

Loan Payback Period: 20 Years

General Project Description:

The Childersburg Water Works, Sewer & Gas Board (Board) has undertaken a project to replace eight lift stations and replace and rehabilitate sections of their sewer mains.

Primary Environmental Benefits:

The project will reduce the electricity consumed by the Board when operating the collection system.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Utility Engineering Consultants, LLC	David Bechtel	Phone: (205) 903-3899 E-mail: dbechtel@uecllc.com

Notes: Interviewed on 4/3/2012

Entity	Contact Name and Title	Contact Phone Number / Email
Childersburg Water Works, Sewer & Gas Board	Brandon Martin	Phone: ( ) - E-mail: bmartincwsg@gmail.com

Notes: Interviewed 4/9/2012

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Replacement of Existing Collection System Assets (Source: Childersburg Water Works, Sewer & Gas Board).

Project Narrative

The Board owns and operates a sewage collection and treatment system which provides services for 1,850 service connections. Wastewater treatment is provided using a treatment lagoon with a design capacity of 0.833 MGD. In 2007 the average daily flow was 0.350 MGD. The collection system contains 170,000 feet of clay-lined sewer mains that range in diameter from 4 inches to 24 inches.

This project involved the replacement of 16 pumps at eight lift stations (two pumps per lift station) and the replacement of 44,400 linear feet of sewer main. This project will result in a reduction of the I/I. The I/I will be reduced by one of three methods, 1) sliplining of existing sewer pipes, 2) pipe bursting, and 3) replacement of pipes which are in poor condition. This reduction in I/I will also reduce electricity consumption. Construction on the project began in January 2009 and ended in December 2011.

Project Components and Associated Costs:

The total project cost was approximately $4,704,000. An itemized list of project components is as follows:

- Sixteen Flygt pumps ranging in horsepower from 5 hp to 15 hp ($1,160,000).
- Sliplining of 17,000 linear feet of 8-inch diameter pipe ($460,000).
- Pipe burst of 18,900 linear feet of 6-inch and 8-inch diameter pipe ($1,536,000).
- Installation of 8,500 linear feet of 20-inch diameter ($1,504,000).

Project Benefits

- Operational data demonstrating energy savings was not available to the project contact, Brandon Martin. According to the Business Case, the project is anticipated to reduce electricity consumption from

150,900 kWh per year to 85,147 kWh per year due to reductions in I/I and 25,600 kWh per year due to the installation of more efficient pumps. The total energy savings is 110,600 kWh per year. Assuming an electricity price of $0.11 per kWh, the cash value of this savings is approximately $12,000.

- The Business Case states that the project is anticipated to reduce I/I in the system by approximately 98,550,000 gallons per year.

Project Cost/Benefit Calculations

- Based on savings of $12,000 per year, the simple payback period on the loan exceeds a 20 year project life.
- Based on energy savings of 2,180,000 kWh per year, this project is anticipated to save 0.72 kWh per dollar invested.
- Based on water savings of 98,550,000 gallons per year, this project is anticipated to reduce I/I by 639 gallons per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/13/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
4 - Atlanta	AL	City of Decatur	CS010248-09

Primary GPR Category:
EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: ER, EC

Total SRF Loan Amount: $15,665,364

ARRA Loan Amount: $10,061,063

GPR Category Loan Amount: EE - $905,750

Principle Forgiveness Amount: $5,135,364

Loan Payback Period: 20 Years

General Project Description:

The City of Decatur (City) rehabilitated their collection system and made a series of energy efficiency improvements to their wastewater treatment processes at their treatment facility.

Primary Environmental Benefits:

Rehabilitation of the collection system will reduce inflow and infiltration. Improvements to wastewater treatment processes will reduce electricity consumption.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ Yes ☒ No

CWSRF Benefits Reporting Information Obtained ☒ Yes ☐ No

SRF Business Case Information Obtained ☒ Yes ☐ No

Internet Search Performed ☒ Yes ☐ No

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ Yes ☒ No

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Constantine Engineering	Joe Downey Jr., Project Manager	Phone: (256) 997-9199 E-mail: jdowney@tcgeng.com

Notes: Interviewed on 4/3/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

High-efficiency, turbo blowers (Source: Decatur Utilities Authority).

Project Narrative

The City of Decatur owns and operates the collection system and Dry Creek Wastewater Treatment Plant (Facility). The City's collection system serves the area within the city limits and receives sewage pumped from the Limestone County Water and Sewer Authority (County). The City has approximately 20,000 residential sewage customers, approximately 2,200 commercial sewage customers, and approximately 40 industrial sewage customers. The industrial sewage discharges represent approximately 60% of the total sewage flow to the Facility. The Facility discharges to the Tennessee River.

The topography for Decatur is relatively flat and allows for most of the sewage collection system to operate by gravity flow. The sewage collection system is comprised of 17 sewage sub-basins that collect sewage in gravity mains. From there, the sewage is pumped by sewage lift stations to another sub-basin or to the Facility. The existing system includes almost two million feet of gravity mains that range in size from 8 inches to 36 inches in diameter. The sewage collection piping materials include clay, concrete, PVC, HDPE, and ductile iron. The sewage system has 18 sewage lift stations, including the lift station for the County.

Constantine Engineering recently completed flow monitoring and a Sanitary Sewer Evaluation Study (SSES) for the Decatur sewage collection system and identified sub-basins and segments with significant rain-dependent I/I. Wet weather flows at the Facility often increase 300 percent over normal average flows during and after wet weather events. When the hydraulic capacity of the sewer system is exceeded, sanitary sewer overflows (SSOs) occur causing untreated sewage to discharge from the collection system. The City received a Consent Order from the Alabama Department of Environmental Management in 2008 to significantly reduce SSOs. Improvements have been identified to reduce wet weather flows, which will reduce treatment costs at the Facility and will also reduce SSO events. Additionally, the Facility's aeration blowers were replaced with energy efficient units.

Construction on the sewer rehabilitation project and Facility energy efficiency components began in October 2009 and reached substantial completion in November 2011. The upgrades to the Facility were completed in March 2011.

Project Components and Associated Costs:

Sewer Rehabilitation—total project cost was $3,500,000.

- 22,000 feet of cast-in-place sewer laterals. Laterals varied from 4-inches in diameter to 6-inches in diameter.
- 7,400 feet of HDPE sewer laterals were burst and removed from service.
- 800 feet of cast-in-place sewer mains. Mains varied from 8-inches in diameter to 24-inches.
- 566 manholes were relined.

Wastewater Treatment Plant Upgrade—total project cost was $150,000.

- Nine high-efficiency, turbo blowers. Two were installed in the headworks and seven were installed in the aeration basin.

Project Benefits

- During the period from February 2010 to October 2010, the nine aeration blowers consumed 8,320,000 kWh which was purchased for $659,000. From February 2011 to October 2011, the upgraded system consumed 6,680,000 kWh which was purchased for $547,000. On this basis, the projected annual savings from the project is approximately 2,180,000 kWh and $148,000.
- According to a preliminary I/I analysis conducted in March 2011 (prior to completion of the sewer rehabilitation project), I/I had been reduced by approximately 26 percent. According to the project contact, Joe Downey Jr., this analysis was done on a basin which was deemed to be in a typical state of repair for the collection system. Therefore, Mr. Downey indicated that the 26 percent flow reduction is likely to be typical of the entire collection system and estimated that a 2.5 MGD flow reduction will be seen when the entire system is analyzed. Mr. Downey stated that typical wet weather (i.e., high-flows observed when substantial I/I flow is occurring within the collection system) flow to the Facility is approximately 30 MGD.

Project Cost/Benefit Calculations

- Assuming annual cash saving of $148,000, the simple payback period for this loan is approximately 16 years.
- The expected energy savings over the twenty year project life is approximately 18 kWh per dollar invested.
- The expected reduction in I/I over the twenty year project life is approximately 7,700 gallons of water per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 4/7/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
4 - Atlanta	AL	City of Montevallo	CS010834-01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP, ER

Total SRF Loan Amount: $8,226,607

ARRA Loan Amount: $5,365,901

GPR Category Loan Amount: EE - $2,388,408

Principle Forgiveness Amount: $2,961,607

Loan Payback Period: 20 Years

General Project Description:

The City of Montevallo (City) has undertaken a project to expand the treatment capacity of the Montevallo Wastewater Treatment Plant (Facility). This project includes installation of grit removal equipment, solids dewatering equipment, sequencing batch reactors, and a new disinfection system.

Primary Environmental Benefits:

This project will reduce electricity consumption at the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Insite Engineering, Inc.	Brian Shannon, Engineer	Phone: ( ) - E-mail: brian@insiteengineering.org

Notes: Interviewed on 3/9/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

The City provides water and sewer service to the residents of the City of Montevallo as well as incorporated portions of Shelby County with a total service population of approximately 5,000 people. The City owns and operates the Facility which is discharging at its permitted capacity and, therefore, must be upgraded to increase its capacity from 0.5 MGD to 1.0 MGD. In addition, the Facility's receiving water, the Cahaba River is 303(d) listed for nutrients and is regulated under an active total maximum daily load (TMDL) for nutrients. According to the project contact, Brian Shannon, the upgrade was necessary in order to improve the nutrient removal capacity of the Facility.

Specifically, the Facility is being upgraded to include the following improvements; construction of an influent lift station, grit removal facility, dual basin sequencing batch reactor (SBR) treatment process, post-equalization basin, chemical addition and mixing facilities, administration building and laboratory, anaerobic digesters, sludge thickeners, and UV disinfection units. The existing Facility did not possess a solids treatment train and all solids produced at the plant were trucked off-site for treatment. The upgraded Facility is able to treat solids and is able to reduce the sludge from two percent solids to 20 percent solids. The City was contacted for information on the project. However, the project contact was not able to provide detailed information on project components, costs, or benefits not previously detailed in the Business Case. Construction on the project began February 2010 and reached substantial completion in December 2011.

Project Components and Associated Costs:

According to the Business Case, the total project cost was approximately $8,000,000. The available information on project components is as follows:

- One Eutek HeadCell™ solids concentrator for grit removal.
- Solids dewatering centrifuge.
- Four UV Disinfection lamps with a total output of 24 kW.
- High efficiency turbo blowers and SBR system.
- Tertiary filters.

Project Benefits

- The existing system did not possess a solids handling treatment train. Instead, solids were hauled by truck to a landfill. The existing Facility averaged 174 loads hauled per year and have reduced hauling to 29 loads per year. This has produced a savings of $65,000 per year.
- According to the Business Case, the project improvements are anticipated to save 2,029,000 kWh/yr. The Business Case values this savings at $142,000 per year. Details were not given on the energy saving.

Project Cost/Benefit Calculations

- Based on cost savings of $207,000 per year, the anticipated simple payback period for this loan is approximately 12 years.
- Over a 20 year project life, the anticipated energy savings are 12 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/18/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

GPR Technical Project Information Reports

EPA REGION 4

Georgia

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
4 - Atlanta	GA	City of Moultrie	CWSRF09-036

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: GP

Total SRF Loan Amount: $3,500,000

ARRA Loan Amount: $3,148,950

GPR Category Loan Amount: EE - $3,148,950

Principle Forgiveness Amount: $2,100,000

Loan Payback Period: 20 Years

General Project Description:

The City of Moultrie (City) has undertaken a project to install new digester covers and boilers at the Moultrie Wastewater Treatment Plant (Facility).

Primary Environmental Benefits:

This project will reduce the Facility's reliance on fossil carbon-derived natural gas by using fuel generated on site for use in the solids handling process.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

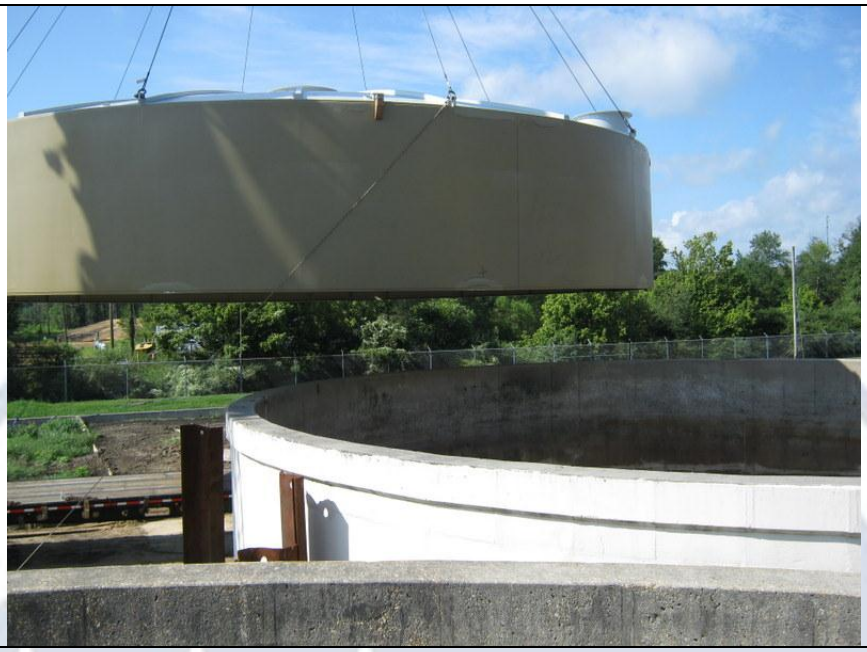
Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Moultrie	Roger King, Director of Utilities	Phone: (229) 890-5432 E-mail:

Notes: Interviewed on 4/16/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:



Installation of Digester Cover (Source: City of Moultrie).

Project Narrative

The City owns and operates the Facility which provides sewage treatment services for a population of 6,700 residential and commercial customers. The Facility possesses a rated capacity of 4 MGD. The City has undertaken a project which will use biogas harvested from the Facility's one primary digester and two secondary digesters as a fuel source. The heat from the gas is then being used as fuel to heat the same three digesters. This project involved the construction of a boiler house with a boiler room and two skid mounted boiler systems with three skid mounted hot water pumps and associated piping and appurtenances. In addition, the project involved the installation of three digester covers to replace the existing covers, installation of three external sludge mixers, all associated yard piping and plumbing, and demolition of existing heat exchangers, sludge transfer pumps, bio gas piping and appurtenances and obsolete sludge piping within the existing digester building. Construction on the project began in December 2010 and was completed in March 2011.

Project Components and Associated Costs:

The total project cost was $3,470,000. Itemized costs for project components total $862,000.

- Three 45-foot diameter digester covers with 23,634 cubic feet of gas storage.
- Two boilers.
- Associated piping and appurtenances.

Project Benefits

- Prior to implementation of this project, the Facility consumed an average of 146,000,000 SCF of natural gas per month to heat the digesters. This consumption dropped to 72,000,000 SCF per month after completion of the project. This results in an annual gas savings of 74,000,000 SCF per year. Assuming a heating value of natural gas equal to 1030 Btu/SCF and a price of $4 per million Btu, the cash value of this savings is approximately $305,000 per year.

Project Cost/Benefit Calculations

- Assuming annual cost savings of $305,000, the simple payback period of this loan is approximately 10 years.
- Over a 20 year project life, this project is estimated to produce an energy equivalent of approximately 69 kWh per dollar invested. This assumes an energy conversion factor of 3,412 Btu per kWh.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/10/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
4 - Atlanta	GA	City of Summerville	CWSRF09-081

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: RE

Total SRF Loan Amount: $480,000

ARRA Loan Amount: $395,664

GPR Category Loan Amount: WE - $395,664

Principle Forgiveness Amount: $288,000

Loan Payback Period: 20 Years

General Project Description:

The City of Summerville (City) has installed a water reuse system at the Summerville Wastewater Water Treatment Plant (Facility). This system conveys treated effluent to a nearby manufacturing facility for use as process water.

Primary Environmental Benefits:

This project reduces potable water consumption by recycled water end-users.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Summerville Wastewater Treatment Plant Website. Retrieved 5/7/2012. <http://www.summervillega.org/departments/waste-water-treatment-plant/>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Summerville	Keitha Shamblin, Financial Director	Phone: (706) 589-0900 E-mail: kshamblin@windstream.net

Notes: Interviewed on 5/7/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Summerville Wastewater Treatment Plant (Source: http://www.summervillega.org/departments/waste-water-treatment-plant/).

Project Narrative

The City owns and operates the Facility, a wastewater treatment plant with a design capacity of 2.5 MGD. The Facility's current average daily flow is approximately 1.0 MGD. The Facility is located adjacent to an industrial park. The City's project involved construction of a pump station and forcemain for conveying treated effluent to a factory in the industrial park that is owned by Mohawk Industries, Inc. The factory will use the recycled effluent from the Facility in its manufacturing processes as a substitute for potable water. Construction on the project was completed in March 2011.

Project Components and Associated Costs:

The total project cost was approximately $480,000. Capital costs for itemized project components were not available from the project contact, Keitha Shamblin, at the time of the interview.

- Two 15 hp pumps.
- Approximately 600 feet of forcemain.

Project Benefits

- The system will reduce potable water consumption at the Mohawk factory by approximately 6,300,000 gallons per year.

Project Cost/Benefit Calculations

- Over a 20 year project life, this project is expected to save 320 gallons of potable water per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/7/2011

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

GPR Technical Project Information Reports

EPA REGION 4

Kentucky

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
4 - Atlanta	KY	City of Sacramento	A2 09-28

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $749,990

ARRA Loan Amount: $749,990

GPR Category Loan Amount: EE - $287,000

Principle Forgiveness Amount: $390,745

Loan Payback Period: 20 Years

General Project Description:

The City of Sacramento (City) has undertaken a project to rehabilitate portions of its collection system.

Primary Environmental Benefits:

The City will reduce the quantity of energy consumed in their collection system by reducing the quantity of pumping required to convey wastewater to the City wastewater treatment plant by reconfiguring their pump station configuration.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
DLZ	Michael Hesse, Project Engineer	Phone: (502) 583-6353 E-mail: mhesse@dlz.com

Notes: Interviewed on 4/30/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Installation of Gravity Sewer (Source: City of Sacramento).

Project Narrative

The City's sanitary sewer system is comprised of approximately 350 residential and small business customers. Each of the customers has a grinder pump installed on each individual property. The grinder pumps are owned and maintained by the City of Sacramento. The useful life of the grinder pumps have expired and the City is incurring significant costs to service, repair, and replace the grinder pumps.

The City has undertaken a project to replace its existing small diameter pressure sewer with a new gravity sewer. The City has dismantled approximately fifty single-hp grinder pumps, installed a new gravity sewer, and installed a new pump station. As a result of this project, the overall system will utilize less energy through the use of one medium sized pump station compared to fifty small grinder pumps. Future phases of the project will replace approximately one hundred and ninety grinder pumps to be served by the same pump station constructed in this project phase. Construction on the project began in the fall of 2009 and was completed in the spring of 2011.

Project Components and Associated Costs:

The total project cost was $750,000. Itemized project component costs are as follows:

- Decommissioning fifty single-hp grinder pumps ($212,500).
- Installed one 20 hp pump station ($100,000).
- Installed 4,033 feet of 8-inch diameter gravity sewer.
- Installed 1,693 feet of 6-inch diameter forcemain.

Project Benefits

- Operational data demonstrating energy savings were not available to Mr. Hesse at the time of the interview, however, he indicated that savings estimates provided in the City's Business Case are likely to closely track realized savings for the system. The existing system consumed approximately 3,400 kWh/yr of electricity and the new system is estimated to consume 1,200 kWh/yr. This represents an energy savings of 2,200

kWh/yr. Based on the City electricity price of $0.062 per kWh, the savings is valued at $137 per year.

- Mr. Hesse indicated that the City replaced approximately 10 grinder pumps per year at a replacement cost of approximately $1,000 per pump. Mr. Hesse indicated that the City will save $10,000 per year in pump replacement costs.

Project Cost/Benefit Calculations

- Assuming cost savings of $10,137 per year, the simple payback period on this loan exceeds a 20 year project life.
- Over a 20 year project life, this project will save 0.15 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/9/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
4 - Atlanta	KY	Kentucky Horse Park	A2 09-16

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: OR

Total SRF Loan Amount: $950,000

ARRA Loan Amount: $950,000

GPR Category Loan Amount: EE - $950,000

Principle Forgiveness Amount: $494,950

Loan Payback Period: 20 Years

General Project Description:

The Kentucky Horse Park (Park) installed a new energy conversion system which will be used to incinerate horse manure and straw and produce electricity.

Primary Environmental Benefits:

This project will reduce the quantity of manure and straw landfilled, produce electricity from a renewable on-site energy resource, and reduce vehicle miles traveled to transport waste materials to landfills.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Kentucky Horse Park Website. Retreived 2/17/2012. <http://kyhorsepark.com/index.php?option=com_content&view=article&id=597&Itemid=307>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Kentucky Horse Park	Mike Scales, Executive Director	Phone: (800) 678-8813 E-mail:

Notes: Interviewed on 2/8/2012

Entity	Contact Name and Title	Contact Phone Number / Email
Kentucky Facilities Development & Efficiency Division	Joe Wolford, Program Coordinator	Phone: (502) 564-3155 E-mail:

Notes: Interviewed on 2/17/2012

Project Narrative

The Park, owned and operated by the Commonwealth of Kentucky, is a 1,229 acre facility used to provide equestrian tourist attractions, competition facilities, resort campgrounds, offices for more than 30 national and regional equine organizations and associations, and open pasture for grazing. Horse operations at the Park produce muck (a mixture of horse waste and straw). The muck has historically been hauled by truck to nearby landfills for disposal.

The purpose of this project is to install a waste conversion process at the Park which will convert all muck produced at the Park into electricity. The electricity generation process involves collecting the muck, feeding it to a gassifier which produces the heat source for a boiler. The boiler powers a turbine-generator assembly. Electricity produced in the project will be used on site. Any excess electricity will be sold back to the local utility. Construction on the project began in 2010 and the system is scheduled to begin operations no later than late 2012.

Project Components and Associated Costs:

Park contacts indicated that they were unable to provide detailed information on project components or costs during their interviews and that producing the requested information would be infeasible within the timeframe necessary to produce this report. However, they indicated that following components have been installed at the Park:

- Gassifier which is used to burn the muck.
- Gassifier feed system.
- Boiler.
- Organic Rankine Cycle Turbine and Generator.

Project Benefits

According to Mr. Wolford, the following estimated project benefits are expected when the project begins operations:

- Burning the muck produced at the park will reduce hauling to off-site landfills, yielding a projected cost savings of $200,000 per year.
- Power generation from muck will reduce the Park's fossil-carbon footprint and generate $40,000 per year in revenues from the sale of electricity back to the local utility.

Project Cost/Benefit Calculations

- Assuming annual revenues and savings from the project totaling $240,000 per year, the payback period for the power generation from muck and electricity sales will be approximately 4 years.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 3/1/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

GPR Technical Project Information Reports

EPA REGION 4

Mississippi

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
4 - Atlanta	MS	City of Clinton	C280805-04-0-ARSR

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $4,098,914

ARRA Loan Amount: $1,900,000

GPR Category Loan Amount: EE - $1,900,000

Principle Forgiveness Amount: $1,900,000

Loan Payback Period: 20 Years

General Project Description:

The City of Clinton (City) constructed a new solids treatment train at the Clinton Southside Wastewater Treatment Facility (Facility) which included a sludge pumping dredge, sludge holding tanks, sludge dewatering and storage facility, solar drying greenhouses, and associated yard piping. Prior to this project, solids collected from the Facility's oxidation ditches were hauled off-site and landfilled.

Primary Environmental Benefits:

The new solids treatment system will utilize less electricity than the existing system. This will improve the Facility's energy efficiency and reduce its carbon footprint.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: MSDEQ News Release. Retrieved on 2/21/2012. <http://www.deq.state.ms.us/newweb/MDEQPres.nsf/67c62401c0604ea286256b29005abada/4684fc2036a2d75c862576340070d288?OpenDocument>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
WGK Engineering	Greg Gearhart, Project Manager	Phone: (601) 925-4444 E-mail: ggearhart@wgkengineers.com

Notes: Interviewed on 3/7/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Sludge Solar Drying House Units (Source: City of Clinton).

Project Narrative

The City owns and operates the Facility which is designed to treat 3.5 MGD of sewage to secondary standards. The Facility's secondary treatment is an oxidation ditch which provides biological treatment of the effluent and produces sludge. The Facility's existing solids treatment train consists of pumping biosolids from the oxidation ditch to a nearby solids storage lagoon. This lagoon contained approximately 7,200,000 gallons of sludge and had nearly reached capacity. The City determined that its alternatives were to truck the biosolids to a landfill or to expand their solids treatment train to produce Class A Biosolids. Class A Biosolids can be distributed to the public for use as compost or as a soil amendment and need not be landfilled unless the quantity of biosolids being produced outstrips local demand.

The City elected to upgrade their treatment train to produce Class A Biosolids. This involved the installation of a dredge at the storage lagoon, a belt-filter press to dewater the solids, and two solar dryers. The solar dryers are buildings with transparent roofs, very similar to a greenhouse, that operate by using sunlight and the buildings' controlled internal climate to dry the biosolids. Since the new drying process began operation, the Facility has been producing biosolids which are dewatered and dried to 95 percent solids. Untreated solids in the storage lagoon are approximately 5 percent solids. Construction on the project began in January 2010 and was completed in January 2011.

Project Components and Associated Costs:

The total project cost was approximately $3,540,000. Itemized project components are as follows:

- Sludge lagoon dredge system with piping ($249,000).
- One 60,000 gallon tanks with mixer ($162,000).
- One 1,200 square foot belt filter press building ($267,000).
- Belt filter press ($608,000).
- 1,200 square foot sludge solar drying unit and automated sludge turning robot ($1,970,000).
- Close circuit TV system ($30,000).

Project Benefits

- The alternative disposal method to producing Class A Biosolids was disposal at a landfill 15 miles from the Facility. According to estimates produced by the City, trucking the existing lagoon biosolids (7,200,000 gallons) and the additional biosolids produced over the life of the project (35,600,000 gallons) would require 8,560 tanker truck loads at 5,000 gallons of biosolids per load. Assuming a tanker truck fuel economy of 4 miles per gallon and a diesel energy density of 36.7 kWh per gallon, the energy equivalent associated the trucking the waste would be 2,360,000 kWh over 20 years, or 118,000 kWh per year. According to the project contact, the energy required to operate the new solids management system is 1,680,000 kWh over 20 years which yields a net savings of 680,000 kWh.
- Based on the 2011 average price of diesel fuel ($3.83 per gallon) and an estimated diesel use reduction of 59,760 gallons, the cost saving over a 20 year project life is approximately $229,000.
- Biosolids produced at the Facility are reused as a soil amendment rather than disposed at a landfill.

Project Cost/Benefit Calculations

- Based on estimated cost savings of $11,000 per year, the simple payback period of the loan exceeds a 20 year project.
- Over a 20 year project life, this project will save an equivalent of 0.36 kWh of energy per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/15/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

GPR Technical Project Information Reports

EPA REGION 4

North Carolina

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
4 - Atlanta	NC	City of Burlington	2W370385-10

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: RE

Total SRF Loan Amount: $65,000

ARRA Loan Amount: $65,000

GPR Category Loan Amount: WE - $65,000

Principle Forgiveness Amount: $32,500

Loan Payback Period: 20 Years

General Project Description:

The City of Burlington (City) installed a new underground cistern at the Kernodle Center for Service Learning and Community Engagement (Center). The cistern will be used to collect and store stormwater from the Center's roof. Stored water will be reused for on-site irrigation.

Primary Environmental Benefits:

The Center will use captured storm water runoff in place of potable water for landscape irrigation.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Stormwater: Journal for Surface Water Quality Professionals. Retrieved on 2/25/2012. <http://www.stormh2o.com/SW/Articles/Funding_Stormwater_Projects_9489.aspx?cpsys_redirect=404>

Other Information Obtained ☒ **Yes** ☐ **No**

Sources: USGS: Average Annual Precipitation Classes to Characterize Watersheds in North Carolina. Retrieved 5/15/2012. <http://nc.water.usgs.gov/reports/ofr01494/index.html>

Contact Information:

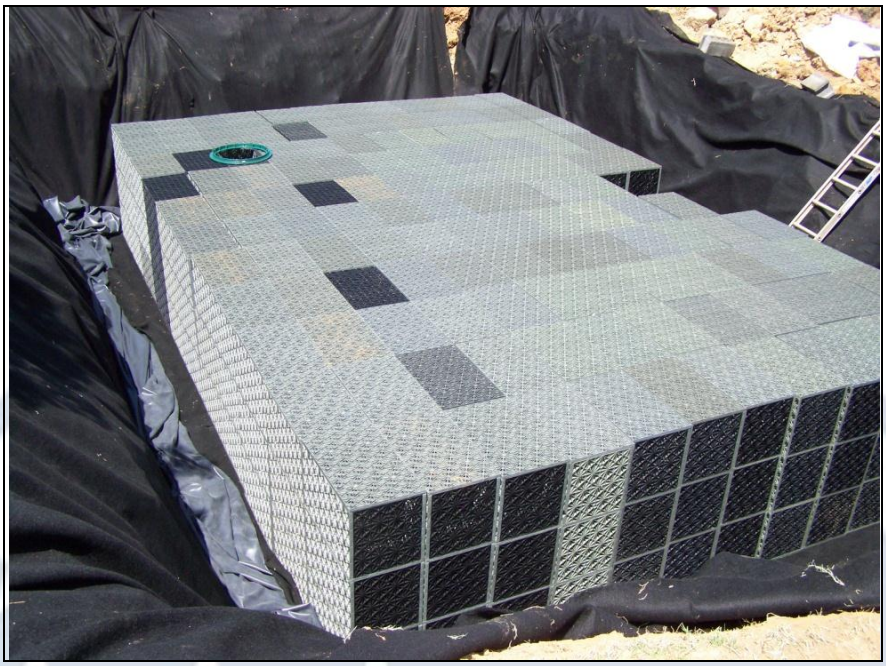
Entity	Contact Name and Title	Contact Phone Number / Email
Alley, Williams, Carmen & King, Inc.	Mark Reich, Engineer	Phone: (336) 226-5534 E-mail: mreich@awck.com

Notes: Interviewed on 3/5/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.



Installation of Cistern (Source: Alley, Williams, Carmen & King, Inc.).

Project Narrative

The Center is located on the Elon University campus. The Center serves the function of: 1) housing *Elon Volunteers!*, a student-led program offering a range of volunteer activities, 2) coordinating the University's academic service-learning programs and courses, and 3) sponsoring alternative break service trips. Surrounding the Center is a 0.5-acre irrigated landscaped area.

The scope of this project includes installation of a system for capturing, storing, and distributing storm water runoff. The captured storm water will be used to irrigate on-site vegetation and will replace the existing irrigation system which utilized potable water supplies. Storm water runoff will be collected from the Center's 5,400 sf roof and stored in the cistern. When irrigation water is required, a sump pump in the cistern will transport stored water to the irrigation distribution system. Project construction started in April 2010 and was completed in July 2010.

Project Components and Associated Costs:

The total project cost was approximately $67,100. Itemized project components are as follows:

- 12,000 gallon cistern ($29,190).
- 400 LF of 2-inch, 4-inch, and 8-inch PVC storm drain ($6,200).
- One Self-Cleansing Filter ($2,000).
- 1 hp submersible pump ($1,900).
- 160 LF of ¾-inch diameter PVC Electrical Conduit ($1,900).
- 170 LF of 1-inch diameter Copper Water Main ($4,400)

Project Benefits

- The project contact, Mark Reich, did not have access to project benefit data at the time of the interview but suggested that the City might have access to monitoring data or water savings estimates. Attempts to contact the City in order to collect this information were unsuccessful.
- According to USGS, annual rainfall in the City is between 40 inches and 45 inches per year. Assuming 40 inches of rainfall and a 5,400 sf roof, the project may have the potential to capture up to 135,000 gallons of rainwater per year.

Project Cost/Benefit Calculations

- Assuming that 135,000 gallons of water per year are captured and used, this project has the potential to reduce potable water consumption by 42 gallons per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/15/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
4 - Atlanta	NC	City of Raleigh	2W370419-15

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: RE

Total SRF Loan Amount: $1,251,388

ARRA Loan Amount: $1,251,388

GPR Category Loan Amount: WE - $1,251,388

Principle Forgiveness Amount: $625,694

Loan Payback Period: 20 Years

General Project Description:

The City of Raleigh (City) has undertaken a project to expand their recycled water distribution and disposal systems. Specifically, the portion of the system associated with the Neuse River Wastewater Treatment Plant (Facility) will be expanded.

Primary Environmental Benefits:

This project will increase the quantity of effluent water distributed for reuse within the City. In addition, the project will reduce the quantity of nitrogen discharged to the Neuse River.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: City of Raleigh Water Reuse Webpage. Retreived 6/18/2012. <http://www.raleighnc.gov/home/content/PubUtilAdmin/Articles/ReuseWaterSystem.html>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

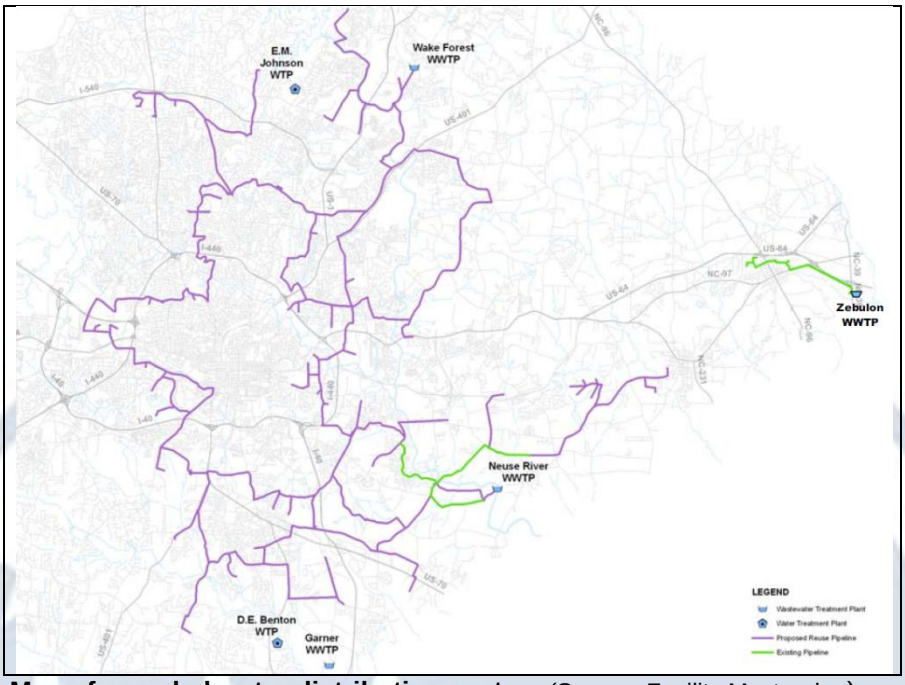
Entity	Contact Name and Title	Contact Phone Number / Email
City of Raleigh	TJ Lynch, Assistant Director for Wastewater Treatment Operations	Phone: (919) 996-4540 E-mail:

Notes: Interviewed 5/2/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.



Map of recycled water distribution system (Source: Facility Masterplan).

Project Narrative

The City owns and operates the Facility which provides wastewater treatment for a service population of approximately 401,000 people. The Facility is permitted to discharge a maximum of 60 MGD. The City manages two reuse water distribution systems. One is located in the Zebulon service area and currently serves eight water reuse customers totaling approximately 39 million gallons annually. This distribution system begins at the Little Creek Wastewater Treatment Plant and terminates at GlaxoSmithKline in Zebulon. The Southeast Raleigh reuse water distribution system, which is the focus of this project, is still under construction. It is currently operational from the Facility to the Walnut Creek Environmental Education Center. Upon completion of this phase of the project, of the Raleigh reuse water distribution system will terminate at NCSU Centennial Campus. Currently, both service areas use reuse water for irrigation, cooling towers, industrial process, concrete production, and toilet flushing.

This project will also expand the spray irrigation system at the Facility to include an additional 106 acres of crop land. This expanded system will reduce the volume of wastewater and nutrients that are discharged to the Neuse River. The Neuse River currently possesses an active total maximum daily load (TMDL) for total nitrogen which limits the quantity of nitrogen which may be discharged from the Facility or other point sources to the Neuse River. The Facility is limited to discharging 676 pounds of total nitrogen per year by the Neuse River total nitrogen TMDL. The irrigation will enable staff to better manage growing conditions and improve nutrient uptake from the soils through farming. The project construction started in January 2010. Information on the substantial completion date for construction was not available at the time of the interview.

Project Components and Associated Costs

The project contact was unable to provide information on specific project components installed, project costs, or project benefits. Information provided by the project contact was limited to the following list of components:

- Irrigation spray heads.
- Standpipes.
- Forcemain.

Project Benefits

- Information on the quantity of water savings attributable to the project was not available.
- Information on the reduction in nitrogen discharge attributable to the project was not available. According to the project contact, the Facility's permit limits total nitrogen discharges to a maximum daily concentration of 2.2 mg/L.

Project Cost/Benefit Calculations

- Absent quantitative benefits information, it is not possible to compute project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/18/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

GPR Technical Project Information Reports

EPA REGION 5

Illinois

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	IL	Bondville	L171753

Primary GPR Category:
EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $2,449,524

ARRA Loan Amount: $1,224,762

GPR Category Loan Amount: EE - $306,191
WE - $306,191

Principle Forgiveness Amount: $612,381

Loan Payback Period: 20 Years

General Project Description:

The Village of Bondville (Village) has undertaken a project to construct a new collection system which will connect the Village with the Urbana Champaign Sanitary District for treatment and disposal. The collection system will replace the current Village configuration individual on-site treatment systems.

Primary Environmental Benefits:

Retiring the decentralized wastewater treatment and disposal system will reduce total Village energy and water consumption due to efficiency improvements associated with switching to a centralized system.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Foth Infrastructure & Environment, LLC	Jay Keigher, State Operating Unit Leader	Phone: (217) 353-7305 E-mail: jay.keigher@foth.com

Notes: Interviewed on 4/10/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Project Narrative

The Village is an unsewered community. Sewage treatment and disposal services within the Village are provided by privately owned and operated septic tanks and lateral fields. These systems have been failing due to age, poorly percolating soils and high groundwater. Failing wastewater treatment and disposal systems have lead to groundwater pollution, surface water pollution, and contamination of private wells. This project involves construction of a new collection system which will collect sewage from the Village and transfer it to the Urbana-Champaign Sanitary District for treatment. The project contact, Jay Keigher, indicated that the engineer most familiar with the project was no longer employed at Foth Infrastructure & Environment, LLC. Mr. Keigher indicated that construction on the project was underway at the time of the interview. A completion date had not been scheduled due to delays associated with procuring easements for the project.

Project Components and Associated Costs:

- No information was available on project components or costs.

Project Benefits

- Retiring the decentralized wastewater treatment and disposal system will reduce total Village energy and water consumption due to efficiency improvements associated with switching to a centralized system.
- The project will reduce groundwater and surface water pollution.
- No quantitative information was available on project benefits.

Project Cost/Benefit Calculations

- Absent information on project costs and benefits, it is not possible to compute project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/19/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	IL	Downers Grove Sanitary District	L173088

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

WE - Water Efficiency

Other GPR Category:

GI - Green Infrastructure

GPR Subcategory: GP, WR

Total SRF Loan Amount: $8,847,011

ARRA Loan Amount: $4,423,506

GPR Category Loan Amount: EE - $1,474,502

WE - $1,474,502

Principle Forgiveness Amount: $2,211,753

Loan Payback Period: 20 Years

General Project Description:

The Downers Grove Sanitary District (District) has installed a grease receiving station at the District's Wastewater Treatment Center (Facility). The receiving station will permit the Facility to accept grease collected from local restaurants and convert it to methane gas via the Facility's anaerobic digester. In addition, the District rehabilitated 120,000 feet of its collection system in order to reduce I/I and peak flows to the Facility.

Primary Environmental Benefits:

Grease is converted into methane gas which is used to provide a renewable on-site energy resource. The collected gas is used as a fuel to heat Facility buildings. Rehabilitation of the collection system will reduce I/I, thereby reducing treatment volumes and saving the associated cost of treatment.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Sulzer - Case Studies. Retrieved on 3/21/2012. <http://www.absgroupusa.com/default.asp?iAreaId=2981>.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Downers Grove Sanitary District	Nick Menninga, General Manager	Phone: (630) 969-0664 E-mail: nmenninga@dgsd.org

Notes: Interviewed on 3/7/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Downers Grove Wastewater Treatment Center Grease Receiving Station (Source: Downers Grove Sanitary District).

Project Narrative

The Facility provides sanitary sewer services for the Village of Downers Grove, and portions of Westmont, Lisle, Oakbrook, and Darien. This service area encompasses 65,000 residents plus commercial and industrial users. The Facility is designed to treat an average daily flow of 11 MGD. Treatment at the Facility consists of screening, grit removal, primary clarification, activated sludge, secondary clarification, and disinfection.

The purpose of this project was the installation of a grease receiving station and the rehabilitation of the District's sanitary sewer collection system in order to reduce the quantity of I/I the system experiences. Rehabilitation of the collection system involved inspecting, cleaning, and grouting sections of sewer lines, service connections, and manholes throughout the system. Installation of a grease receiving station permitted the District to accept grease and use it as a feedstock for Facility's anaerobic digester, along with biosolids wasted from the Facility's activated sludge process. The new feedstock will supplement the current production of methane gas in the anaerobic digester. The collected methane gas is used in place of purchased natural gas. Construction on the project began in January 2010 and reached substantial completion in January 2011.

Project Components and Associated Costs:

- Grease Receiving Station ($57,000).
- Cleaning, pressure testing, and grouting of 120,000 feet of sanitary sewer, 2,100 service connection, and rehabilitation of 350 manholes ($2,988,000).

Project Benefits:

- Adding grease to the District's anaerobic digester increases methane production and reduces the Facility's consumption of fossil-carbon derived energy sources (i.e., natural gas). Prior to installation of the Grease Receiving Station (December 2010 to December 2011), the Facility produced approximately 6,690,000 SCF of methane gas. Between December 2011 and February 2012, the Facility produced 10,800,000 SCF

of methane gas, which is a 61 percent increase in methane production. According to the District's representative, Nick Menninga, the Facility's gas typically possesses 600 Btu/SCF. The District pays $0.40/100,000 Btu for natural gas, which implies an annual cost savings of approximately $40,000.

- Reducing the quantity of I/I in the District's collection system reduces peak hydraulic loadings on the Facility. Mr. Menninga indicated that measurement of changes to I/I following completion of the sewer rehabilitation is ongoing; however, he stated that a reduction in the system's excess peak inflow rate by 6 MGD is anticipated.

Project Cost/Benefit Calculations:

- Assuming annual revenues of $40,000 per year for natural gas production, the payback period on the portion of the loan earmarked for Energy Efficiency exceeds the 20 year project life. Treatment cost savings were not included. The payback period on the cost of the grease receiving station is less than 2 years.
- Based on the first three months of operation, the expected energy produced over a 20 year project life is equivalent to approximately 40 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 3/7/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	IL	LaSalle	L172773

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

WE - Water Efficiency

Other GPR Category:

GPR Subcategory: EC, RE

Total SRF Loan Amount: $15,000,000

ARRA Loan Amount: $7,500,000

GPR Category Loan Amount: EE - $625,000

WE - $625,000

Principle Forgiveness Amount: $3,750,000

Loan Payback Period: 20 Years

General Project Description:

The City of LaSalle (City) has undertaken a project to construct a new collection system and a new wastewater treatment plant (Facility). The new Facility contains energy efficiency and water efficiency components.

Primary Environmental Benefits:

This project will reduce energy and water consumption.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: NewTribune Website. "Construction under way on La Salle's wastewater treatment plant". Retreived 3/7/2012. <http://www.newstrib.com/articles/news/local/default.asp?article=20128&aname=Construction+under+way+on+La+Salle%27s+wastewater+treatment+plant>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Crawford, Murphy, and Tilly, Inc.	Scott Knight, Project Manager	Phone: (314) 571-9057 E-mail:

Notes: Interviewed on 3/28/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

LaSalle Wastewater Treatment Plant (Source: http://www.lasalle-il.gov/content/public-works-119201081813am.aspx).

Project Narrative

The Facility is has a 0.5 MGD daily average flow capacity and provides sewage treatment for a population of 10,900 residents. The City has undertaken the East Side Wastewater System Improvement Project. The project consists on construction of an influent sewer and flow equalization basins. Additionally, the City is making a series of improvements to the Facility including installation of a new membrane bioreactor, a new biosolids destruction process, and a variety of additional improvements (details were not available). Examples of the energy efficiency improvements included installation of motion sensor lighting, retrofitting Facility motors with VFDs, and installation of SCADA system. The project also included the installation of an effluent reuse system which allows the Facility to recycle treated effluent onsite as process water. Construction on the project began in November 2009. According to the project contact, Scott Knight, construction was nearing completion at the time of the interview.

Project Components and Associated Costs:

The total project cost was $13,500,000. At the time of the interview, limited information was available to Mr. Knight on project components and their costs. The available information on project components is as follows:

Collection System ($1,200,000):

- Collection System and Equalization Basin.

Facility Improvements ($8,550,000):

- Vertical Loop Reactor™.
- Cannibal™ Biosolids Destruction System.
- Membrane Bioreactor System ($2,000,000).
- Motion Sensor Lighting.
- VFD motor retrofits.
- SCADA System.
- Effluent Reuse System.

Project Benefits

- The effluent reuse system reduces the quantity of potable water consumed at the Facility and reduces the total quantity of effluent discharged to the receiving water. Quantitative information on water savings were not available to the project contact, nor were savings estimates provided in the Business Case.
- Quantitative information on energy savings were not available to the project contact, nor were savings estimates provided in the Business Case.

Project Cost/Benefit Calculations

- Absent information on project costs and benefits, it is not possible to compute project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/19/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	IL	McNabb	L172477

Primary GPR Category:
EE - Energy Efficiency
Secondary GPR Category:
WE - Water Efficiency
Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $1,320,475
ARRA Loan Amount: $660,238
GPR Category Loan Amount: WE - $110,039
EE - $110,040
Principle Forgiveness Amount: $330,119
Loan Payback Period: 20 Years

General Project Description:

The Village of McNabb (Village) has constructed a new sewage collection system and a new sand filter based wastewater treatment system. This new system will replace the Village's existing system of individual on-site disposal systems.

Primary Environmental Benefits:

The project will centralize the Village's wastewater treatment and improve the quality of effluent discharged. In addition, energy will be conserved by consolidating the Village's privately owned and operated individual on-site disposal systems into a centralized system.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**
CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**
SRF Business Case Information Obtained ☒ **Yes** ☐ **No**
Internet Search Performed ☒ **Yes** ☐ **No**
Sources: No useful information was obtained by internet research.

Other Information Obtained ☒ **Yes** ☐ **No**
Sources: NPDES Permit No. IL 0078000.

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
McClure Engineering	Jack Kusek, Project Manager	Phone: (815) 343-9014 E-mail: j.kusek@mcclureengineering.com

Notes: Interviewed on 3/13/2012

Project Narrative

Prior to the project, the Village was served by a system of privately owned and operated individual on-site disposal systems. However, a combination of failing individual on-site systems and soils unsuited to on-site wastewater disposal lead to groundwater pollution, surface water pollution, and contamination of private wells. To address these problems, the Village has undertaken a project to construct a new centralized collection and treatment system.

The project involved constructing a gravity collection system which will convey flow from 152 service connections to a new 0.0372 MGD recirculating sand filter wastewater treatment system. Treated effluent from the recirculating sand filter will be discharged to an unnamed tributary of Clear Creek. All of the pumps included in the project were designed to operate at efficient points on the pumping curves and all of the motors were high efficiency motors. The collection system was pressure tested and televised to eliminate or minimize any infiltration into the system, saving any unnecessary pumping costs. The system was designed to make use of gravity sewers wherever possible. Only two pump stations were required in the new system. Project construction began in December 2009 and was completed in December 2010.

Project Components and Associated Costs:

The total project cost was $2,400,000. Capital costs for select project components are as follows:

- 16,000 linear feet of sewer and force main ($738,000).
- 55 4-foot diameter manholes ($110,000).
- Two pump stations ($120,000).
- Two 48,500 gallon septic tanks and two 5,760 square foot recirculating sand filters ($1,070,000).

Project Benefits:

- The project centralized the Village's wastewater treatment and improved the quality of effluent discharged. According to the project contact, energy will be conserved by consolidating the Village's individual on-site disposal systems into a centralized system. Also, according to the project contact (and confirmed in the project Business Case), no estimates of expected energy or water savings were computed for this project. Current operational data for this project was not available at the time of the interview.

Project Cost/Benefit Calculations:

- In the absence of benefit data or estimated benefit projections, it is not possible to conduct cost/benefit calculation for this project.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 4/24/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	IL	Reading Township	L172095

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

WE - Water Efficiency

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $7,393,355

ARRA Loan Amount: $3,696,678

GPR Category Loan Amount: EE - $924,170

WE - $924,169

Principle Forgiveness Amount: $1,848,339

Loan Payback Period: 20 Years

General Project Description:

Reading Township (Township) has undertaken a project to upgrade and convert their decentralized wastewater treatment system to a centralized system with a new sanitary sewer collection system and wastewater treatment lagoon.

Primary Environmental Benefits:

This project will result in the elimination of storm water pollution, ground water pollution, contamination of private wells and hazardous health situations in the Township due to failing individual on-site disposal systems.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Farnsworth Group	John Johnston, Project Manager	Phone: (309) 663-8435 E-mail: jjohnston@f-w.com

Notes: Interviewed on 4/12/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

Currently, Township wastewater system consists of privately owned and operated individual on-site disposal systems. These existing systems have had operational problems due the prevalence of high ground water levels and poorly drained soils which interfere with the operation of the drain fields. These failing decentralized wastewater disposal systems lead to ground water pollution, surface water pollution, and contamination of private wells. Consequently, the Village has undertaken a project to construct a new sanitary sewer collection system and a wastewater treatment lagoon. The project contact, John Johnston, was contacted for an interview regarding the project on April 12, 2012. However, it was not possible for Mr. Johnston to participate in the interview; therefore, all information was taken from the project Business Case. Construction on the project began in March 2010.

Project Components and Associated Costs:

The total State Revolving Fund loan was $7,939,355. No information was available on the specific project component installed as part of the project.

Project Benefits

- According to the Business Case, this project is intended to reduce ground water pollution, surface water pollution, and contamination of private wells. Specific information on the project's impact on ground water, surface water, or well water was not available.
- The Business Case indicates that the project will reduce total energy consumption in the Township by centralizing wastewater treatment.

Project Cost/Benefit Calculations

- Absent specific project benefits information, it is not possible to compute project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/1/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	IL	South Lyons Sanitary District	L171794

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

WE - Water Efficiency

Other GPR Category:

GPR Subcategory: EP, WR

Total SRF Loan Amount: $5,108,456

ARRA Loan Amount: $2,554,228

GPR Category Loan Amount: EE - $638,557

GI - $638,557

Principle Forgiveness Amount: $1,277,114

Loan Payback Period: 20 Years

General Project Description:

The South Lyons Sanitary District (District) has undertaken a project to improve the sanitary sewer collection system which conveys sewage to the Stickney Water Reclamation Plant.

Primary Environmental Benefits:

The project will reduce I/I into the system. This will reduce the volume and associated cost of treatment at the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Village of La Grange Official Website. Retrieved 3/8/2012. <http://www.villageoflagrange.com/index.aspx?NID=209>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Heuer and Associates Consulting Engineers	Matt Gollan, Project Engineer	Phone: (708) 492-1000 E-mail: mgollan@heuerengineers.com

Notes: Interviewed 3/28/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Stickney Water Reclamation Plant (Source: http://www.waterworld.com/articles/wum/articles/print/volume-2/issue-3/Departments/briefs.html).

Project Narrative

The District has undertaken a project to rehabilitate their sanitary sewer collection system in order to reduce I/I. The District provides sewage collection and treatment for approximately 650 service connections. The project included the removal or sealing of pipe defects that allowed groundwater infiltration to enter the sanitary sewer system. Specific aspects of the work included the removal of defective service lateral connections and the lining of sewer mains. Sections of sewer requiring repair or replacement were identified during a televisual survey of the collection system. The survey covered approximately 60 percent of the collection system. In addition, the project utilized cured-in-place (CIP) pipe lining technology. Construction on the project began in October 2009 and substantial completion was achieved in October 2011.

Project Components and Associated Costs:

The total project cost was approximately $5,600,000. Project components installed and costs are as follows:

- CIP lining of 50,000 linear feet of gravity sewer ($1,100,000).
- Replacement of 9,500 linear feet of gravity sewer laterals ($780,000).
- Replacement of 5,000 linear feet of gravity sewer mains ($475,000).
- Replacement and repair of 300 home and business connection tie-ins (Cost unavailable).
- Waterproofed 200 manholes ($142,000) and replaced 30 manholes ($150,000).

Project Benefits

- According to the project contact, the project will reduce groundwater infiltration into the sanitary sewer system and will save energy by reducing pumping and treatment costs. Quantitative information on project benefits was not available from the project contact, nor were benefits estimates provided in the Business Case.

- According to the Business Case, the CIP construction process was anticipated to utilize 7,000 gallons of water, whereas a traditional construction process may use up to 140,000 gallons of water.

Project Cost/Benefit Calculations

- Absent information on project benefits, it is not possible to compute project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/19/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

GPR Technical Project Information Reports

EPA REGION 5

Indiana

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	IN	Columbus	WW080903 04

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

EI - Environmentally Innovative

Other GPR Category:

GI - Green Infrastructure

GPR Subcategory: EC

Total SRF Loan Amount: $51,805,000

ARRA Loan Amount: $4,000,000

GPR Category Loan Amount: EE - $2,469,500

EI - $1,285,500

Principle Forgiveness Amount: $0

Loan Payback Period: 20 Years

General Project Description:

The City of Columbus (City) has built a new wastewater treatment plant (Facility) to replace their existing plant. The Facility incorporates unit processes and operations which are capable of meeting the City's wastewater treatment needs more reliably and with increased energy and water efficiency.

Primary Environmental Benefits:

The Facility will provide the City with greater treatment capacity, produce less sludge, and operate more energy efficiently than the existing wastewater treatment plant.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful materials were found during the search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Columbus Utilities Deparment	Keith Reeves, Utility Director	Phone: (812) 372-8861 E-mail: kreeves@columbusutilities.org

Notes: Interviewed on 2/24/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Oxidation ditch process at the Facility (Source: City of Columbus).

Project Narrative

The City's existing wastewater treatment plant is space limited and can't expand to meet current and projected flow rates. The capacity must also be increased to meet newly captured combined sewer overflows. The peak wet weather flow is projected to rise to 39 MGD—more than twice the current peak hourly treatment capacity (approximately 18 MGD). Therefore, the City has undertaken a project to construct a new wastewater treatment plant. The new Facility incorporates unit processes and operations which are capable of meeting the City's wastewater treatment needs more reliably and includes installation of a variety of energy and water efficiency improvements. The Facility's treatment train will utilize a headworks with mechanical screens, an oxidation ditch, a Cannibal™ Sludge Reduction Process, aerobic digestion, and dewatering. Construction on the project began in the fall of 2009 and reached substantial completion in July 2011.

Project Components and Associated Costs:

The City's representative, Keith Reeves, provided a detailed list of energy and water efficiency improvements; however, an itemized breakdown of project capital costs was not available.

- In the headworks, mechanical screens are now set to run automatically based on process control sensors. As a result, the screens run only when necessary as opposed to running at timed intervals that could cause them to run unnecessarily.
- The screening wash press automation is synchronized with the mechanical screens in order to prevent the wash press to run unnecessarily.
- The Facility's oxidation ditch utilizes 18 motors to provide aeration. Twelve of the motors will have VFDs which enhance the energy efficiency of the motors. In addition, the oxidization ditch operates at a low dissolved oxygen concentration which increases aeration efficiency and reduces the amount of time which the motors are running.
- The four return activated sludge pumps, two screened return activated sludge pumps, five raw sewage pumps, two centrifuge feed pumps, and two centrifuges will use VFDs in order to improve the units' energy efficiency.
- All motors utilized at the Facility which were 1-hp or greater were specified to be premium efficient. The total motor horsepower at the Facility is 3,604 hp.

- The Facility will utilize energy efficient, fluorescent T8 lamps and all exterior lighting will be controlled using timers and a SCADA system.
- The Facility minimizes the use of paved areas in order to minimize the quantity of storm water runoff generated on-site and utilizes bioswales to treat and infiltrate the storm water that does occur. Water efficient landscaping will reduces the need for summertime irrigation.
- Disinfected effluent water (DEW) is utilized in the Facility's geothermal heating/cooling system. All on-site hydrants utilize DEW rather than potable water. The DEW system is designed for an average daily use of 0.5 MGD and a peak daily water use of 0.864 MGD.
- The Facility utilizes a Cannibal Solids Reduction System as part of the activated sludge process which results in a 65 percent to 85 percent reduction in solids production.

Project Benefits

Determining energy savings for the Facility is difficult since the basis for comparison is not that similar (old plant v. new facility). In addition, Mr. Reeves indicated that observed electricity consumption information for the new Facility is not available. Therefore, energy savings will be estimated by comparing the projected energy use of the Facility with the average projected energy use of the design alternatives considered by the City, as presented in the City's Business Case.

- The total annual energy use of the Facility was projected to be 8,630 kWh per year. The average of the seven other alternative designs considered by the City was 10,800 kWh per year. Therefore, the estimated energy savings of the project is 2,170 kWh per year. Assuming an electricity purchase price of $0.11/kWh, the cash value of this annual savings is approximately $240.
- Water savings and efficiency information was not available.

Project Cost/Benefit Calculations

- Assuming annual revenues of $240 per year for electricity savings, the simple payback period of this loan is anticipated to exceed a 20 year project life.
- The expected energy produced over a 20 year project life is 0.01 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 3/21/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	IN	Darlington	CS182383 01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC, EP

Total SRF Loan Amount: $1,000,000

ARRA Loan Amount: $600,000

GPR Category Loan Amount: EE - $78,000

Principle Forgiveness Amount: $600,000

Loan Payback Period: 20 Years

General Project Description:

The City of Darlington (City) has undertaken a project to upgrade their wastewater treatment plant (Facility) in order to expand its treatment capacity from 0.11 MGD to 0.13 MGD. These improvements include upgrades to the aeration system which will make the Facility more energy efficient.

Primary Environmental Benefits:

The aeration system upgrade component of the project will reduce the Facility's consumption of fossil-carbon derived electricity.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Triad Associates	Tom Schubert, Project Manager	Phone: (317) 377-5230 E-mail:

Notes: Interviewed on 3/30/2012

Entity	Contact Name and Title	Contact Phone Number / Email
City of Darlington	Judy Anderson, Clerk Treasurer	Phone: (765) 794-4496 E-mail:

Notes: Interviewed on 3/28/2012

Project Narrative

The City owns and operates the Facility which provides wastewater treatment for 854 residents. The Facility's existing liquid treatment train includes the following unit processes; comminutor followed by extended aeration, disinfection, a polishing pond, then discharge. This project entails upgrading liquid treatment train by adding tertiary clarification after extended aeration before polishing and discharge.

The project involves making modifications to the existing aeration tanks by replacing the existing coarse bubble diffusers with fine bubble diffusers. The appropriate oxygen level for an aeration basin can be reached with a smaller quantity of air using a fine bubble diffuser. This results in lower power requirements for blowers and related equipment which reduces electricity consumption and lower operational costs. The project also includes new aeration blowers. As a result of this project, the Facility saw a capacity increase from 110,000 GPD to 130,000 GPD. According to the project contact, Tom Schubert, construction on the project began in June 2011 and was competed in December 2011.

Project Components and Associated Costs:

The total cost for the project was unavailable to the project contacts at the time of their interviews. The total GPR component of the loan was $78,000. Specific information on the project components was unavailable to the project contacts at the time of the interviews. An itemized list of project components, including cost information taken from the project Business Case, include the following:

- Fine bubble diffusers ($34,620).
- Aeration blowers ($64,000).

Project Benefits

- Utility bills (see table below) for the Facility provided by the City from the periods of November 2010 to March 2011 (prior to the new aeration system starting operations) and November 2011 to March 2012 (after the start of operations), indicate the project is saving the system an average 1,500 kWh per month. This implies an anticipated average savings of 18,000 kWh per year. Assuming future electricity prices remain similar to the November 2011 through March 2012 average ($0.10 per kWh); the value of this annual savings is approximately $1,800.

DATE	ELEC CONSUMPTION (kWh)	COST ($)	DATE	ELEC CONSUMPTION (kWh)	COST ($)	ELEC DIFFERENCE (kWh)	COST DIFFERENCE ($)
11/1/2010	21,680	$2,080	11/1/2011	22,120	$2,220	-440	-$140
12/1/2010	24,160	$2,314	12/1/2011	23,720	$2,378	440	-$64
1/1/2011	26,040	$2,500	1/1/2012	25,240	$2,517	800	-$17
2/1/2011	28,000	$2,685	2/1/2012	26,840	$2,674	1,160	$11
3/1/2011	32,520	$3,113	3/1/2012	26,960	$2,686	5,560	$427
MONTHLY AVERAGE ELECTRICITY/COST SAVINGS						1504	$44

Project Cost/Benefit Calculations

- Assuming annual savings due to the project of $1,800 per year, the simple payback period for loan exceeds a 20 year project life.
- Over a 20 year project life, this project is expected to save 4.6 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/8/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	IN	Goshen	WW090720 02

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: ER

Total SRF Loan Amount: $36,137,000

ARRA Loan Amount: $5,000,000

GPR Category Loan Amount: EE - $2,500,000

Principle Forgiveness Amount: $5,000,000

Loan Payback Period: 20 Years

General Project Description:

The City of Goshen (City) has undertaken a project to install a new digester cover and to install a SCADA system at the wastewater treatment plant (Facility).

Primary Environmental Benefits:

The project will increase energy production at the Facility and reduce emissions of methane.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful informaiton was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Goshen	Dustin Sailor, City Engineer	Phone: (574) 537-3814 E-mail: allankaurrman@goshencity.com

Notes: Interviewed on 3/27/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Project Narrative

The City owns and operates the Facility which has a design flow of 4.4 MGD and provides sewage treatment for approximately 29,400 residents. The City has undertaken a project to install a SCADA system and to install a new digester cover at the Facility. The existing Facility was last upgraded in 1994 and possesses a primary digester and secondary digester operated in series. The dual deck-type floating cover of the existing 65-foot diameter secondary digester is in poor repair and requires replacement. Due to the poor condition of the cover, all biogas produced in the secondary digester is vented to the atmosphere. Replacement of the cover permits the City to capture the biogas and burn it on-site to heat Facility buildings and processes. The installation of the SCADA will allow operators to manage the Facility more efficiently. Construction on the project began in October 2009. Information on the project completion date was not available.

Project Components and Associated Costs:

According to the Business Case, the total project cost was anticipated to be approximately $3,320,000. The available information on project components and costs is as follows:

- SCADA system ($1,200,000).
- Sixty five foot diameter secondary digester cover ($2,050,000)

Project Benefits

The project contact, Dustin Sailor, did not have access to project benefits data at the time of the interview since construction was not completed. Mr. Sailor indicated that benefits estimates contained in the Business Case represent the most current information on project benefits.

- According to the Business Case, the City anticipates that the SCADA system will reduce electricity consumption at the Facility. However, these estimates have not been quantified. The Business Case states that use of the SCADA system will allow the City to run the system with fewer operators, saving the City $266,000 annually.
- According to the Business Case, the existing gas production and capture rate from 2006 to 2008 at the two digesters was 15,480,000 Btu per day and $4,700 per month was spent to purchase additional gas to meet heating demand. The anticipated daily gas production after installing the new gas cover is 20,330,000 Btu per day, an increase in production of 1,770,000,000 Btu annually. The increase in on-site production is anticipated to eliminate the need to purchase gas.

Project Cost/Benefit Calculations

- Based on annual project savings of $322,400, the simple payback period on the loan is approximately 8 years.
- Based on an increased gas production of 1,770,000,000 Btu per year and assuming an energy content of 3,412 Btu per kWh, the anticipated energy savings over a 20 year project life is 4.2 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/24/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	IN	Rensselaer	WW070837 01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

WE - Water Efficiency

Other GPR Category:

GPR Subcategory: EP, RE

Total SRF Loan Amount: $3,780,000

ARRA Loan Amount: $1,135,000

GPR Category Loan Amount: EE - $353,500

WE - $270,500

Principle Forgiveness Amount: $1,097,600

Loan Payback Period: 20 Years

General Project Description:

The City of Rensselaer (City) has undertaken a project to improve facilities and equipment at the Rensselaer Wastewater Treatment Plant (Facility). Specific energy and water saving improvements include conversion of the existing chlorine disinfection system to a UV disinfection system and installation of premium efficiency motors in new and existing mechanical units.

Primary Environmental Benefits:

This project will reduce energy and water consumption at the Facility through the use of energy efficient motors and reduced water use for disinfection dilution by switching to a UV system.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
HNTB	Guito Borgnini, Project Manager	Phone: (317) 636-4682 E-mail: GBORGNINI@HNTB.com

Notes: Interviewed on 4/16/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Project Narrative

The Facility's design capacity is 3.8 MGD and is being upgraded to 4.2 MGD as part of the project. The Facility provides sewage treatment services for a population of approximately 5,300 residents. The City has undertaken a project to improve unit processes, facilities, and equipment at the Facility. Specific improvements which will increase energy and water efficiency at the Facility include conversion of the existing chlorine disinfection system to a UV disinfection system and installation of premium efficiency motors in new and existing mechanical units. Construction on the project started in May 2009. Information on the project completion date was not available

Project Components and Associated Costs:

Information on project costs was unavailable to the project contact at the time of the interview and during subsequent follow-up contacts. Information on project components was limited to the description provided in the project narrative. A list of energy and water efficiency project components are as follows:

- New UV disinfection system.
- New premium efficiency motors for seven aeration blowers, one fine screen motor, one grit screen conveyor, and two grit screen blowers.

Project Benefits

- According to an estimate made by the project contact, the new UV system will reduce the demand for dilution water at the disinfection system by 20 gallons per minute during the Facility's seven month disinfection season. This implies a water savings of approximately 6,050,000 gallons per year.
- According to documentation provided by the project contact, the City has computed the following estimates of electricity savings attributable to the project. These estimates assume an electricity cost of $0.082 per kWh.

RENSSELAER WWTP IMPROVEMENTS ENERGY SAVINGS (Premium Efficiency Motors vs. Normal Efficiency Motors)

LINE	DESCRIPTION	HP	NORMAL EFF.	PREMIUM EFF.	NORMAL kW	PREMIUM kW	kW CHANGE	HOURS / YEAR	SAVINGS PER YEAR
1	Aeration Blower No. 1	50	92.4%	94.5%	40.37	39.47	0.897	4000	$ 294.24
2	Aeration Blower No. 2	50	92.4%	94.5%	40.37	39.47	0.897	4000	$ 294.24
3	Aeration Blower No. 3	50	92.4%	94.5%	40.37	39.47	0.897	4000	$ 294.24
4	Aeration Blower No. 4	50	92.4%	94.5%	40.37	39.47	0.897	4000	$ 294.24
5	Aeration Lift Blower No. 1	15	88.5%	92.4%	12.64	12.11	0.534	4000	$ 175.05
6	Aeration Lift Blower No. 2	15	88.5%	92.4%	12.64	12.11	0.534	4000	$ 175.05
7	Aeration Lift Blower No. 3	15	88.5%	92.4%	12.64	12.11	0.534	4000	$ 175.05
8	Fine Screen Drive Motor	2	82.5%	86.5%	1.81	1.72	0.084	1000	$ 6.86
9	Grit Screw Conveyor	1	80.0%	85.5%	0.93	0.87	0.060	1000	$ 4.92
10	Grit System Blower No. 1	2	82.5%	86.5%	1.81	1.72	0.084	4000	$ 27.43
11	Grit System Blower No. 2	2	82.5%	86.5%	1.81	1.72	0.084	4000	$ 27.43
								Total Annual Electricity Savings (kWh)	**21,570**
								Total Annual Cost Savings	**$ 1,769**

Project Cost/Benefit Calculations

- Assuming an annual cost savings of $1,769, the simple payback period of the loan exceeds a 20 year project life.
- Over a 20 year project life, this project is anticipated to save 0.69 kWh per dollar invested.
- Over a 20 year project life, this project is anticipated to save 194 gallons of water per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/30/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

GPR Technical Project Information Reports

EPA REGION 5

Michigan

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	MI	8 1/2 Mile Drain Drainage District	5393-01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC, SO

Total SRF Loan Amount: $2,205,000

ARRA Loan Amount: $897,000

GPR Category Loan Amount: EE - $882,000

Principle Forgiveness Amount: $882,000

Loan Payback Period: 20 Years

General Project Description:

The 8 1/2 Mile Drain Drainage District (District) has undertaken a project to upgrade a pump station in the collection system. The District is also installing a new solar array, a new boiler, and making miscellaneous energy improvements at their wastewater treatment plant (Facility).

Primary Environmental Benefits:

This project will improve energy efficiency at the pump station and the Facility and produce renewable electricity on site.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Macomb County 3/29/2011 Press Release. Retrieved 6/11/2012. <http://www.macombcountymi.gov/publicworks/documents/Energy2.doc>.

Other Information Obtained ☒ **Yes** ☐ **No**

Sources: State Revolving Fund Environmental Assessment. Retrieved 6/11/2012. <http://www.macombcountymi.gov/publicworks/documents/5393-01FONSI.pdf>.

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Macomb County	James Pistilli, Assistant Chief Engineer	Phone: (586) 469-5343 E-mail: jim.pistilli@macombcountymi.gov

Notes: Interviewed on 3/12/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Macomb County Public Works Commissioner Anthony V. Marrocco (left) and U.S. Representative Sander Levin (right) examine a solar energy panel (Source: http://www.macombcountymi.gov/publicworks/images/AVMLevin1_000.jpg).

Project Narrative

The District owns and operates the Facility, one of two treatment plants that provide sewage treatment to the Southeast Macomb Sanitary District (SMSD). The District provides wastewater treatment for approximately 90,000 residents. The District has undertaken a project that includes upgrading the large pumps at nearby pump station, installing 20 kW of solar panels at the Facility, replacing a 1,775,000 Btu boiler with a 500,000 Btu boiler, and installing energy-efficient windows, doors, and lighting. Electricity generated by the solar panels will run the lighting, heating and cooling systems, computers and three small pumps at the Facility. Installation of the photovoltaic array is being used to offset loads and provide carbon offset credits to the District. The project began in February 2011 and reached substantial completion in January 2012.

Project Components and Associated Costs

The total cost for this project was not available. The primary project components were as follows:

- Refurbishment of three high capacity wet weather pumps (72-inch diameter) with pump telemetry, and rehabilitation of three 2,750 hp motors ($2,700,000).
- Installation of eighty four solar panels, with a total installed capacity of 20 kW ($175,000).
- Replacement of the existing 1,775,000 Btu boiler with a high efficiency condensing unit. Integration of space occupancy and energy-use tracking information into the existing SCADA system to allow for optimized use of heating and cooling of the Facility ($231,000).
- Installation of new, energy efficient doors, windows, and lighting ($72,000).

Project Benefits

- The project contact, Jim Pistilli, stated that he thought the photovoltaic cells were anticipated to pay for themselves within 10 years but was unable to locate estimates or data to support this assertion.

Project Cost/Benefit Calculations

- Absent specific benefits information, it is not possible to compute project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/11/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25//2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	MI	Genesee County Drain Commission	5399-01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $24,240,000

ARRA Loan Amount: $9,696,000

GPR Category Loan Amount: EE - $2,361,087

Principle Forgiveness Amount: $9,696,000

Loan Payback Period: 20 Years

General Project Description:

The Genesee County Drain Commission (County) has undertaken a project to upgrade two blowers at the Anthony Ragnone Treatment Plant (Facility).

Primary Environmental Benefits:

The project improvements will result in the County reducing their electricity consumption at the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Wasde Trim Projects Website. Retrieved on 3/20/2012. <http://www.wadetrim.com/services/wrs_wwt_prj1.htm>.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Genesee County Water & Wastewater Division	Matt Raysin, Engineer	Phone: (810) 732-7870 E-mail: mraysin@gcdcwws.com

Notes: Interviewed on 3/12/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

The County owns and operates the Facility. The Facility was designed and built in 1975 to treat an average daily flow of 20 MGD and was expanded to a treatment capacity of 25 MGD and a hydraulic capacity of 40 MGD. The County has elected to upgrade unit processes and mechanical systems at the Facility including grit and scum removal systems, fine-bubble diffuser aeration improvements, disinfection improvements, new wet weather facilities, and pump system upgrades. Effluent from the Facility is discharged to the Flint River. This energy efficiency project involved making improvements to the Facility's aeration system.

The purpose of this project was to introduce functional redundancy (i.e., a blower may be removed from service without impairing the Facility's ability to provide sufficient aeration to its activated sludge system) into the Facility's aeration system and to reduce the energy use of the aeration system. The existing aeration system was previously operated with two 3-stage, 800 hp blowers and one 2-stage, 1,250 hp blower. When the larger blower was removed from service, the system was not able to reliably provide sufficient oxygen to the activated sludge system. The system will be upgraded by replacing one of the existing 800 hp blowers with a new 1,250 hp blower and the remaining 800 hp blower's motor will be refurbished.

Project Components and Associated Costs:

The total project cost was approximately $2,360,000.

- Refurbishment and conversion of one 800 hp blower into a 1,250 hp blower.
- Refurbishment of one additional 800 hp blower. Size of motor will remain unchanged.

Project Benefits

- According to documentation provided by the project contact, the County anticipates a reduction in electricity costs from the aerators at 21 percent per month once the project begins operations. The savings are approximately $94,600 per year and 1,350,000 kWh/yr.

Project Cost/Benefit Calculations

- Based on anticipated annual savings of $94,600 per year, the simple payback period for this project exceeds a 20 year project life.
- This project is anticipated to produce approximately 11 kWh per dollar invested over a 20-year project life.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/14/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	MI	Midland	5376-01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: GP

Total SRF Loan Amount: $10,000,000

ARRA Loan Amount: $4,026,434

GPR Category Loan Amount: EE - $4,000,000

Principle Forgiveness Amount: $4,000,000

Loan Payback Period: 20 Years

General Project Description:

Midland County (County) owns and operates a landfill. The County has undertaken a project to install a biogas recovery wellfield and processing system at the landfill. Recovered methane from the landfill will be transported to the County's wastewater treatment plant (Facility) where it will be converted to electricity.

Primary Environmental Benefits:

This project will reduce the Facility's consumption of fossil-carbon derived electricity and reduce the Facility's carbon footprint.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Waste Management World. Retrieved 6/9/2012. <http://www.waste-management-world.com/index/display/article-display/1552393884/articles/waste-management-world/waste-to-energy/2011/01/Landfill Gas to Energy Project to Power Waste Water Treatment Plant.html>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
CTI and Associates, Inc.	Beth Benoit, Project Engineer	Phone: (248) 467-7308 E-mail: bbenoit@cticompanies.com

Notes: Interviewed on 3/12/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Midland Gas to Energy Project (Source: http://www.waste-management-world.com/etc/medialib/new-lib/wmw/online-articles/2011/01.Par.10696.Image.gif?direct=1).

Project Narrative

The County owns and operates a landfill. Existing well field are used at the landfill to remove subsurface leachate and to capture methane. The project involved the construction of new wells to supplement the existing wells. Captured biogas is then transported via an existing three-mile long pipeline and converted to electricity at the Facility. Electricity produced from the methane conversion process is sold to a nearby DOW chemical plant. The project also involved a new methane to electricity conversion system. Additionally, waste heat from conversion process is reused at the Facility to heat anaerobic digesters and buildings. Construction on the project began in February 2010 and was completed in February 2011. Operations began in March 2011.

Project Components and Associated Costs

- Project component and cost information was not available from the project contact.

Project Benefits

- This project will reduce the Facility's consumption of fossil-carbon derived electricity and reduce the Facility's carbon footprint.

Project Cost/Benefit Calculations

- Absent quantitative benefits data, it is not possible to calculate the project cost/benefit.

Prepared By: Jared Richardson (PG Environmental, LLC) on 3/12/2011

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	MI	St. Clair County	5372-01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: GP

Total SRF Loan Amount: $14,045,000

ARRA Loan Amount: $7,591,834

GPR Category Loan Amount: EE - $7,591,834

Principle Forgiveness Amount: $5,096,000

Loan Payback Period: 20 Years

General Project Description:

St. Clair County (County) has undertaken a project at the Smiths Creek Landfill (Landfill) to construct and operate a septage bioreactor and landfill gas-to-energy conversion process.

Primary Environmental Benefits:

This project provides the County with a source of renewable energy and extends the useful life of the Landfill.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Waste Business Joural. Retrieved on 5/14/2012. <http://www.wastebusinessjournal.com/news/wbj20111206O.htm>.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
St. Clair County	Matthew Williams, Landfill Manager	Phone: (810) 989-6979 E-mail: mwilliams@stclaircounty.org

Notes: Interviewed 3/14/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Project Narrative

The County owns and operates the Landfill, a three-acre facility which provides solid waste disposal for 170,000 residents. The County has undertaken a project to construct a septage bioreactor unit at the Landfill which injects septage into the landfill subsurface. The County removes 1.5 million gallons per year of septage from the Detroit Wastewater Treatment Plant and injects it into the Landfill. The injected septage provides energy for subsurface bacteria which accelerates the rate material decomposes in the Landfill subsurface. One effect of this process is increased methane production at the Landfill's methane extraction wells. Methane is captured and converted to electricity which is used to power on-site landfill leachate treatment units, landfill buildings, and the septage receiving facility. This gas-to-energy process was constructed in 2008 as part of research project designed to evaluate the utility of septage bioreactors. The ARRA/GPR loan was used to provide operational funds to continue operating the bioreactor and to fund research evaluating the bioreactor's performance, and to build a new landfill leachate treatment system.

Project Components and Associated Costs

The total project cost was approximately $9,090,000. Itemized project components are as follows.

- Gas collection wellfield expansion ($280,000).
- New gas-to-energy conversion building ($1,300,000).
- Landfill leachate pretreatment facility ($3,200,000).
- Lagoon leachate treatment system ($1,000,000).
- Four-mile sepatge transmission pipeline ($710,000).
- Septage bioreactor research project ($2,600,000).

Project Benefits

- The construction of the sepatge bioreactor increased landfill gas production from a production rate of 650 SCF per minute to a rate of approximately 1,100 SCF per minute, an increase of 236,520,000 SCF per year. Based on an assumed heating value of landfill gas (500 Btu/SCF) and price ($4 per million Btu), the approximate cash value of this increased gas production is $304,000 per year.
- According to the project contact, Matthew Williams, the septage bioreactor project has increased the rate of landfill settlement seven times greater than the normal rate. An increased settlement rate extends the useable life of the Landfill.

Project Cost/Benefit Calculations

- Assuming a cost savings of $304,000 per year, the simple payback period of this project exceeds a 20 year project life.
- Over a 20 year project life, it is anticipated that this project will produce an energy equivalent of kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/14/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	MI	Ypsilanti Community Utilities Authority	5334-01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $5,075,000

ARRA Loan Amount: $2,030,000

GPR Category Loan Amount: EE - $456,243

Principle Forgiveness Amount: $2,030,000

Loan Payback Period: 20 Years

General Project Description:

The Ypsilanti Community Utilities Authority (Authority) has undertaken a project to upgrade the pumping systems at the Willow Run and Martz pump stations.

Primary Environmental Benefits:

This project will reduce electricity consumption at the pump stations and reduce the stations carbon footprint.

Project Information Resources:

SRF / ARRA Application Obtained from State ☒ **Yes** ☐ **No**

CWSRF Benefits Reporting Information Obtained ☐ **Yes** ☒ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Ypsilanti Community Utilities Authority	Scott Westover, Engineer	Phone: (734) 484-4600 ext 220 E-mail: swestover@ycua.org

Notes: Interviewed on 3/13/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Project Narrative

The Authority owns and operates the Willow Run and Martz pump stations. These stations convey wastewater from the Authority's sewage collection system to the Authority's wastewater treatment plant. This project involved the rehabilitation of two pump stations, including installation of new pumps, installation of VFDs, and modifications of pump motors. Construction on this project began in October 2009 and reached substantial completion in September 2010.

Project Components and Associated Costs:

The total project cost was $5,100,000. Specific cost information was not available to the project contact, Scott Westover, at the time of the interview. Project components are as follows:

- Installations of an unspecified number of pumps at the Willow Run pump station. All pumps were manufactured by Flygt. Each new pump at the Willow Run pump station is 100 hp and is rated at 7.1 MGD. The new pump specifications match the existing pumps but with upgrades to include VFDs manufactured by Eaton Corporation.
- Installations of an unspecified number of pumps at the Martz pump station. All pumps were manufactured by Flygt. Each new pump at the pump station is 250 hp and is rated at 7.6 MGD. The original pumps at Willow Run were 125 hp and were rated at 7.25 MGD each. Reductions in energy consumption will be due to new VFDs installed on the new pumps.

Project Benefits

- Mr. Westover stated that operational data for the project was unavailable. Energy savings estimates were computed during the planning phase of the project. Mr. Westover stated that these computations indicated that the project would result in a 30 percent reduction in electricity consumption; however, he was not able to locate these computations, nor was the original electricity demand available at the time of the interview.

Project Cost/Benefit Calculations

- Absent benefits data, it is not possible to conduct the project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/11/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	MI	Ypsilanti Community Utilities Authority	5426-01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $1,133,585

ARRA Loan Amount: $1,133,585

GPR Category Loan Amount: EE - $1,133,585

Principle Forgiveness Amount: $2,030,000

Loan Payback Period: 20 Years

General Project Description:

The Ypsilanti Community Utilities Authority (Authority) has undertaken a project to make improvements to unit processes at their wastewater treatment plant (Facility). These improvements include upgrades to the Facility's aeration system, automated aeration process controls, tertiary filter, UV disinfection system, installation of a new SCADA system, and miscellaneous additional improvements.

Primary Environmental Benefits:

This project will reduce the Facility's electricity consumption and carbon footprint.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

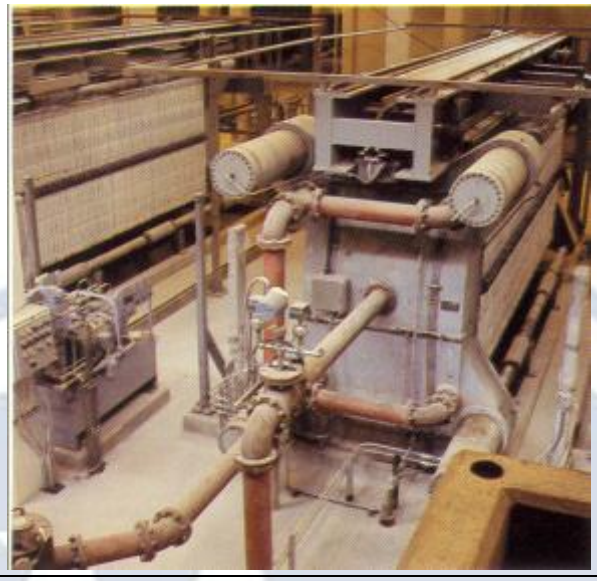
Entity	Contact Name and Title	Contact Phone Number / Email
Ypsilanti Community Utilities Authority	Scott Westover, Engineer	Phone: (734) 484-4600 ext 220 E-mail: swestover@ycua.org

Notes: Interviewed on 3/13/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.



Ypsilanti Community Utilities Authority Wastewater Treatment Plant (Source: YCUA).

Project Narrative

The Authority owns and operates the Facility which provides sewage treatment for a population of 76,900 residents. The Facility's liquid treatment train includes a mechanical bar screens, grit chambers, primary settling tanks, aeration tanks, secondary settling tanks, tertiary filters, and UV disinfection, followed by discharge to Willow Creek. The solids treatment train includes gravity thickeners, filter presses, and incinerators.

This project involved making a series of improvements to unit processes at the Facility, including improvements to aeration system (new blowers and automated DO controls), modification of the UV disinfection system, rehabilitation of the Facility's tertiary filters, modification to segments of the HVAC system, upgrades to the boiler and heating system, and site lighting system retrofits. These improvements were undertaken in order to improve the function of unit processes and increase energy efficiency at the Facility. Construction on the project started in January 2010 and reached substantial completion in January 2011.

Project Components and Associated Costs:

The total project cost was $1,150,000.

- Modification of blower to reduce motor hp from 1070 hp to 940 hp ($40,000).
- Installation of automated DO controls (cost information for this improvement was unavailable).
- Modification of UV system to introduce automated controls which reduce the number of UV bulbs operating during low flows ($2,000).
- Rehabilitation of tertiary filters to reduce filter backwash frequency (cost information for this improvement was unavailable).
- Lighting system retrofits ($265,000).
- HVAC upgrades and ventilation system improvements ($67,000).
- Upgrade to boiler system ($10,000).
- Incinerator heat recovery system ($65,000).
- Upgrade and modification to EMS system including new SCADA ($2,000).
- Upgrade to solids system. Specific information on the modification made to the solids treatment train was unavailable except cost information ($240,000).

Project Benefits

- The project contact, Scott Westover, provided information on changes in power consumption due to the project. However, information on the quantity of electricity saved was unavailable. Mr. Westover provided estimates of anticipated cost savings (see table below) due to reductions in electricity use which were developed during the project planning phase.

Improvement	Power Rating (kW)		Annual Savings
	Before	After	
Blower Improvement	798	701	$68,000
UV System Programming	13.8	11	$2,000
Lighting System Improvements	189	91	$110,000
Ventilation Improvements	154	29	$64,000
Boiler System Optimization	1,538	1,418	$27,000
HV Control Upgrades	750	370	$140,000
Incinerator Room Heat Recovery System	180	0	$19,000
EMS System	38	19	$2,500
HVAC Improvements	48	21	$14,000
Totals			**$446,500**

Project Cost/Benefit Calculations

- Based on an anticipated annual cost savings of $446,500, the simple payback period for this loan is approximately 3 years.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/8/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25/2012

GPR Technical Project Information Reports

EPA REGION 5

Minnesota

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	MN	City of Big Lake	MPFA-03-0015-R-FY10

Primary GPR Category:
EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $15,470,120

ARRA Loan Amount: $4,086,556

GPR Category Loan Amount: EE - $4,000,000

Principle Forgiveness Amount: $2,000,000

Loan Payback Period: 20 Years

General Project Description:

The City of Big Lake (City) currently operates a heated aerobic digestion process for processing biosolids at the wastewater treatment facility (Facility). The City is replacing the aerobic digester with a new sludge dryer.

Primary Environmental Benefits:

The new solids handling process will reduce energy consumption at the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ Yes ☒ No

CWSRF Benefits Reporting Information Obtained ☒ Yes ☐ No

SRF Business Case Information Obtained ☒ Yes ☐ No

Internet Search Performed ☒ Yes ☐ No

Sources: No useful information was obtained from the interternet search.

Other Information Obtained ☐ Yes ☒ No

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Bolton & Menk, Inc.	Seth Peterson, Project Manager	Phone: (952) 890-0509 E-mail: sethpe@bolton-menk.com

Notes: Interviewed on 4/2/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Sludge Dryer (Source: City of Big Lake).

Project Narrative

The City currently operates a heated aerobic digestion process for processing biosolids at the wastewater treatment facility (Facility). This process utilizes two blowers (one for redundancy), a boiler for heating the sludge and two recirculation pumps (one for redundancy). Other pumps and equipment are used as part of the entire biosolids process, however, for purposes of this evaluation, only the blower, boiler and recirculation pump will be considered in determining energy usage. The aeration blower, boiler and recirculation pump run constantly to maintain the necessary temperature and aeration requirements in the digester. In 2009, the City hauled 780,000 gallons of aerobically digested biosolids from the Facility to their land application site located 3.4 miles from the Facility.

The new biosolids process will utilize a heat drying system that will dry the product to 90 percent solids. The existing digester tank will be used form a storage facility and the existing blower and boiler will no longer be utilized. The liquid solids in the new process will be dewatered through two centrifuges (a new one for redundancy), be stored in a dewatered solids bunker and then fed to the paddle dryer. The dryer is a displacement-type dryer and is heated using a hot oil boiler system.

The results of the project will be a reduction in the amount of biosolids for disposal. The drying process will also impact the land application of the biosolids. Currently, the City land applies the liquid product on fields that are located 3.4 miles from the site. The new biosolids for disposal will be Class A, allowing the City to land apply on land adjacent to the Facility eliminating the need for extensive hauling. Construction on the project began in late 2009 and is scheduled to reach substantial completion in April 2012.

Project Components and Associated Costs

- One sludge dryer manufactured by Komline ($3,940,000).
- One centrifuge ($443,500).

Project Benefits

At the time of this writing, the Facility improvements installed for this project have not begun operation. However, Mr. Peterson has provided a set of estimates for energy savings from the project.

- The existing system utilizes approximately 412,000 kWh per year of electricity and 56,800 therms per year of natural gas. Assuming a dryer run time of 5 hours per week and an electricity consumption rate of 200 kW per hour, the total projected electricity demand would be 202,000 kWh per year. The anticipated electricity savings are 210,000 kWh per year. Total expected natural gas consumption by the system is 30,300 therms per year, yielding a projected savings of 26,500 therms per year. Total cost savings due to projected electricity and natural gas consumption reductions were estimated at approximately $35,000 per year.

Project Cost/Benefit Calculations

- Assuming annual savings of $35,000 per year, the payback period of the energy efficiency component of the loan exceeds the 20 year project life.
- Based on the provided estimates, the expected energy produced over a 20 year project life is equivalent to 4.9 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 4/7/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	MN	City of Grand Rapids	MPFA-07-0018-R-FY10

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

WE - Water Efficiency

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $30,193,957

ARRA Loan Amount: $5,002,470

GPR Category Loan Amount: EE - $4,022,709

WE - $714,000

Principle Forgiveness Amount: $28,509,779

Loan Payback Period: 20 Years

General Project Description:

The City of Grand Rapids (City) has undertaken a project to install an effluent water reuse system and new solids handling equipment at the Grand Rapids wastewater treatment plant (Facility).

Primary Environmental Benefits:

This project will reduce the consumption of potable water and gasoline at the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Grand Rapids Public Utilities Commission. Retieved 4/6/2012.
<www.grandrapids.govoffice.com/index.asp?Type=B_BASIC&SEC=%7B7226E2DD-90ED-49D9-94A3-C6FE937BAE07%7D>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Advanced Engineering and Environmental Services, Inc.	Jason Benson, Project Manager	Phone: (763) 463-5036 E-mail: jason.benson@ae2s.com

Notes: Interviewed on 4/5/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Project Narrative

The City owns and operates the Facility which provides collection and treatment to 3,246 City residents and 24 rural customers. The City also provides treatment for the City of Cohasset, the City of LaPrairie, Itasca Community College and the UPM/Blandin Paper Company. Wastewater collection is provided through a 57 mile system of gravity and force mains with nine pump stations located throughout the City. The Facility's treatment train consists of screening, primary clarification, an activated sludge process, and disinfection. The existing solids treatment train uses a blending tank for primary sludge and waste activated sludge, polymer addition, a flocculation tank, a rotary drum thickener, and two belt filter presses. Treated biosolids are trucked to a nearby landfill for disposal.

The City undertook a project to add an effluent water reuse system and to replace their belt filter presses with new screw presses. The effluent water reuse system utilizes treated, disinfected effluent as process water for backwashing biosolids treatment units and as a heat exchange medium for heating and cooling the Facility's new administrative building. Reused effluent saves water for the Facility by displacing the use of potable water in these systems. The belt-filter replacement will save energy by increasing the solids concentration of treated biosolids. As the solids concentration goes up and the water content of the biosolids decrease, the total volume and mass of the biosolids cake decreases and fewer truck trips are necessary for final disposal. Construction on the project began in the summer of 2009 and was completed in April 2011.

Project Components and Associated Costs:

The total project and project component costs were not available to Mr. Benson at the time of the interview. The total GPR loan for this project was $4,736,709. Mr. Benson indicated the project included the following components:

- One effluent reuse system.
- Two screw presses.

Project Benefits

- Use of the effluent water reuse system reduces potable water demand at the Facility by approximately 0.30 MGD.
- Increased dewatering efficiency has reduced the number of trips (20 to 30 percent reduction) from the Facility to the local landfill. The exact change in energy consumption or an estimate of the total reduction in miles traveled was unavailable to Mr. Benson at the time of the interview.

Project Cost/Benefit Calculations

- Absent specific data on energy savings, it is not possible to compute project cost/benefit calculations for energy savings realized by the project.
- Over a 20 year project life, it is anticipated that this project will save approximately 462 gallons of water per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/7/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25/2012

GPR Technical Project Information Reports

EPA REGION 5

Wisconsin

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	WI	Grand Chute - Menasha West Sewerage Commission	4033-04

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

GI - Green Infrastructure

Other GPR Category:

GPR Subcategory: EC, EP

Total SRF Loan Amount: $30,057,259

ARRA Loan Amount: $15,028,630

GPR Category Loan Amount: EE - $3,277,500

GI - $11,751,130

Principle Forgiveness Amount: $15,028,630

Loan Payback Period: 20 Years

General Project Description:

The Grand Chute-Menasha West Sewerage Commission (Commission) undertook a project to upgrade the Grand Chute-Menasha West Wastewater Treatment Plant (Facility) in order to accommodate population growth in the Town of Grand Chute and to meet new ammonia limits.

Primary Environmental Benefits:

The project ugrades will reduce the energy consumption of the disinfection system relative to design alternatives which were considered.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
CH2M Hill, Inc.	Bill Desing, Project Manager	Phone: (414) 847-0313 E-mail: wdesing@ch2m.com

Notes: Interviewed on 4/25/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

The Commission undertook a project to upgrade the Facility in order to accommodate population growth in the Town of Grand Chute and meet new ammonia limits contained in the Commission's NPDES permit. The Facility has an average dry weather design flow of 5.68 MGD and peak wet weather flow of 26 MGD. The Facility provides sewage treatment services for a population of approximately 33,137 residents. The Commission has undertaken this project to replace its existing UV disinfection system with a new UV disinfection system. The project also includes installation of 42 VFDs on a variety of Facility mechanical units, a new auto thermal thermophilic aerobic digestion (ATAD) system, a new integrated fixed film activated sludge (IFAS) unit process, and a new waste heat recovery system. IFAS technology uses an efficient aeration system and the installation of floating plastic media which provides a surface area for fixed film microbial growth to attach. The fixed film growth contains the slow growing nitrifying organisms that allow the Facility discharges to comply with the new ammonia limits. The ATAD system processes solids generated at the Facility resulting in the destruction of volatile solids. Construction on the project began in October 2009 and was completed in December 2011.

Project Components and Associated Costs:

The total project cost was $24,000,000. According to the project contact, Bill Desing, all project component information contained in the Business Case is current and complete. The following project component information has been taken from the project Business Case:

- New 31 MGD UV disinfection system ($1,900,000).
- VFDs for the mechanical units listed in the following table. Total costs for all VFDs were $600,000.

Description	Number	HP per Pump	New Premium Efficiency Motor	Notes
Influent Pumps	5	100	Yes	Replace existing 75 hp VFD and motors.
Return Activated Sludge Pumps	4	10	Yes	New Units - IFAS Process
Effluent Reuse Pumps	2	30	Yes	Replaces existing constant speed pumps.
Gravity Belt Thickener Feed Pumps	2	15	Yes	--
Primary Sludge Pump	1	15	Yes	--
Belt Press Feed Pumps	3	15	Yes	--
Odor Control Fan 1	1	3	Yes	--
Odor Control Fan 2	1	15	Yes	--
ATAD Jet Mix Pumps	2	125	Yes	ATAD Process
ATAD Foam Pumps	3	40	Yes	ATAD Process
Additional Jet Mix Pumps	2	60	Yes	ATAD Process
ATAD Blowers	3	60	Yes	ATAD Process
Additional Blowers	2	40	Yes	ATAD Process
Off-Gas-Fan	1	40	Yes	ATAD Process
Recirculating Pumps	2	15	Yes	ATAD Process
Belt Press Drive	2	3	Yes	--
Polymer Feed Pumps	4	1	Yes	--
HVAC Supply Fan 1	1	5	Yes	--
HVAC Exhaust Fan 1	1	5	Yes	--

- Two new, 250,000 gallon ATAD reactors ($8,300,000).
- New IFAS system, including installation of plastic microbial-attachment media and one new aeration basin ($6,500,000).
- Waste heat recovery system ($350,000).

Project Benefits

- Project benefits information was not available to Mr. Desing. According to the Business Case, the new UV system is capable of operating with 236 fewer UV bulbs than the alternative UV disinfection system design which was considered, resulting in 25 percent less electricity consumption. The Business Case presents the 25 percent relative savings, but does not present the absolute anticipated electricity savings or associated cost savings.
- According to the Business Case, the new VFDs are projected to reduce electricity consumption by approximately 30 percent. The Business Case presents the 30 percent relative savings, but does not present the absolute anticipated electricity savings or associated cost savings.
- According to the Business Case the IFAS system will reduce energy consumption at the Facility by 20,805 kWh per year relative to other design alternatives which were considered.
- According to the Business Case, the uses of the ATAD process will decrease the volume of biosolids which must be hauled off-site for disposal by 2,117 CY per year.
- According to the Business Case, the Commission anticipates saving $29,000 per year based on a reduced purchase of 2,800,000 cubic feet of natural gas during the five month heating system. Assuming a heat content of 1,030 BTUs per SCF of natural gas and 3,412 BTU/kWh, this energy savings is equivalent to 410,317 kWh per year of electricity equivalents.

Project Cost/Benefit Calculations

- Based on the available information on cost savings associated with project benefits, the simple payback period for this loan is anticipated to exceed a 20 year project life.
- Over a 20 year project life, this project is anticipated to save 0.57 kWh electricity equivalents per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/30/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	WI	Village of Saint Nazianz	4007-04

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC

Total SRF Loan Amount: $289,069

ARRA Loan Amount: $289,069

GPR Category Loan Amount: EE - $35,000

Principle Forgiveness Amount: $289,069

Loan Payback Period: 0 Years

General Project Description:

The Village of Saint Nazianz (Village) has undertaken a project to improve the solids handling processes at the Village wastewater treatment plant (Facility)

Primary Environmental Benefits:

This project will improve Facility energy efficiency and reduce energy consumption.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Village of Nazianz	Kay Mueller, Clerk	Phone: (920) 773-2471 E-mail: villageofstnazianz@tds.net

Notes: Interviewed on 4/27/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Project Narrative

The Village owns and operates the Facility, a 200,000 GPD wastewater treatment plant which provides sewage treatment for a population of approximately 742 residents. The Village has undertaken a project at the Facility to make a series of improvements to the Facility sludge handling and storage units. Specifically, the Village installed a new sludge storage tank, replaced sludge pumps, installed a SCADA system, and converted existing sludge storage tank into a septage receiving station. Village personnel were contacted for interviews on the project, however, the project contact, Kay Mueller, indicated that the employees involved with planning and implementing the project were no longer employed by the Village. In addition, the project contact was unable to locate Village records containing specific information on project components, costs, or benefits. No information on the construction timeline was available.

Project Components and Associated Costs:

The total project cost and project component costs were not available. An itemized list of project components is as follows:

- Installed a new sludge storage tank.
- Converted existing sludge storage tanks into a septage receiving station.
- Replaced an unspecified number of septage receiving pump and return activated sludge pumps with new pumps with VFD.
- Installed a new SCADA system.

Project Benefits

- There was no information available on project benefits.

Project Cost/Benefit Calculations

- Absent specific benefits information, it is not possible to compute project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/18/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
5 - Chicago	WI	Village of Cambria	4724-02

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC, EP

Total SRF Loan Amount: $598,821

ARRA Loan Amount: $301,675

GPR Category Loan Amount: EE - $20,000

Principle Forgiveness Amount: $301,675

Loan Payback Period: 19 Years

General Project Description:

The Village of Cambria (Village) has undertaken a project to replace several pumps with new high-efficiency pumps at the Cambria wastewater treatment plant (Facility).

Primary Environmental Benefits:

This project will reduce electricity consumption at the Facility and reduce the Facility's carbon footprint.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Village of Cambria	Tom Tietz, Director of Public Works	Phone: (920) 348-5415 E-mail:

Notes: Interviewed on 4/30/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Project Narrative

The Village owns and operates the Facility which provides sewage treatment for approximately 780 residents and has average dry weather flow design capacity of 126,500 GPD. The Village has undertaken a project to upgrade and rehabilitate the headworks of the Facility. These improvements include the replacement of three influent pumps with high efficiency pumps and VFDs. Construction on this project began in October 2009 and was completed in November 2010.

Project Components and Associated Costs:

The total project cost was $600,000. Itemized costs were not available to the project contact, Tom Tietz at the time of the interview. An itemized list of project components are as follows:

- Three 200 GPM pumps (manufactured by LW Allen, Inc.) with VFDs (manufactured by Allen Bradley, Inc.).

Project Benefits

- Mr. Tietz indicated that it would not be possible to collect operational data demonstrating energy savings from the project since the energy consumption change is smaller than the month-to-month variations in Facility wide electricity consumption, rendering any savings unobservable. However, the Village produced a Business Case which estimates that the existing system consumed approximately 140,200 kWh per year and the upgraded system was expected to consume 95,800 kWh per year, yielding an anticipated savings of approximately 44,600 kWh per year. The savings in energy were valued at $2,676.

Project Cost/Benefit Calculations

- Assuming annual cost savings of approximately $2,676 per year, the simple payback period of this loan is approximately 7 years.
- Over a 20 year project life, this project is expected to save approximately 44.6 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/31/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25/2012

GPR Technical Project Information Reports

EPA REGION 6

Arkansas

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
6 - Dallas	AR	Batesville	WRD-003-738

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $12,600,000

ARRA Loan Amount: $8,753,620

GPR Category Loan Amount: EE - $9,680,006

Principle Forgiveness Amount: $6,300,000

Loan Payback Period: 20 Years

General Project Description:

The City of Batesville (City) has undertaken a project to replace a traditional pump station with a screw pump and gravity system of conveyance of wastewater to the City wastewater treatment plant (Facility) and to construct a new force main.

Primary Environmental Benefits:

This project will reduce electricity consumption at the pump station and the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Batesville	Damon Johnson, City Engineer	Phone: (870) 698-2400 E-mail:

Notes: Interviewed on 4/23/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Existing Forcemain (Source: Batesville Business Case).

Project Narrative

The City is under a Consent Administrative Order with the Arkansas Department of Environmental Quality because of the condition of its collection system and treatment plant. The Facility has an 8.0 MGD design capacity and provides wastewater treatment services for a population of approximately 10,000 residents and three large poultry plants. The City has undertaken the project to rehabilitate their collection system and upgrade their treatment plant. The work will be done in several phases. This project is the first phase and involves the replacement of a pump station and forcemain from the City to the Facility with screw pumps, a gravity line and tunnel. The capacity of the new gravity sewer is 24 MGD. This project will save the City electricity and O&M costs associated with the old inefficient pump station. Construction on the project began in December 2010. The scheduled construction completion date was not available to the project contact, Damon Johnson, at the time of the interview.

Project Components and Associated Costs:

The total project cost was $14,705,000. Itemized project components are as follows:

- Three 86-inch diameter screw pumps ($2,000,000).
- 1,200 feet of 48-inch diameter gravity sewer (costs unavailable).
- 1,700 feet of 60-inch diameter tunnel (costs unavailable).

Project Benefits

- According to the Business Case, this project is anticipated to save the City 462,602 kWh per year of electricity, valued at $90,000 per year, which represents a 62 percent savings over the existing system. The project contact, Mr. Johnson indicated that these estimates are current but that the computations supporting the estimate were not available at the time of the interview.
- According to the Business Case, the project is anticipated to reduce the carbon footprint of the Facility by approximately 1,500,000 lbs of CO_2 equivalents per year.

Project Cost/Benefit Calculations

- Based on savings of $90,000 per year, the simple payback period for the loan exceeds a 20 year project life.
- Over a 20 year project life, the anticipated electricity savings from the project are approximately 0.96 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/13/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25/2012

GPR Technical Project Information Reports

EPA REGION 6

Louisiana

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
6 - Dallas	LA	City of Baker	CS221505-01

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: ME

Total SRF Loan Amount: $500,000

ARRA Loan Amount: $500,000

GPR Category Loan Amount: WE - $500,000

Principle Forgiveness Amount: $500,000

Loan Payback Period: 0 Years

General Project Description:

The City of Baker (City) has installed water meters at each of their service connections throughout the City and an automated meter reading system.

Primary Environmental Benefits:

The installation of meters allows the City to charge water and sewer users based on the quantity of service utilized, rather than a flat access fee, which will increase the efficiency of water use and wastewater disposal by customers.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Professional Engineering Consultants Corporation	Kevin Gravois, Engineer	Phone: (225) 769-2810 E-mail: kgravois@pecla.com

Notes: Interviewed on 5/2/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Neptune Technology Group Water Meter (Source: http://sansom.ca/wp-content/uploads/2011/12/wm-meter-04.jpg)

Project Narrative

The City has 14,000 residents and approximately 5,800 water and sewer connections. This project involved installing water meters at each water service connection. Previously, these connections had been unmetered and the City charged a flat service fee for water and sewer use. With the new meters, the City will instead charge based on usage, which incentivizes efficient water use by end users and produces less wastewater. The meters are equipped with wireless transmitters that send meter data to the City's automated billing software via relay towers. The project contact, Keven Gravois, commented that this has been a good project for the City. Construction on the project began in February 2010 and was completed in November 2011.

Project Components and Associated Costs:

The total project cost was $3,300,000. Itemized costs for project components were not available at the time of the interview. The system is a Fixed-Base AMI system manufactured by Neptune Technology Group.

- ¾-inch residential meters (90 percent of meters installed).
- 1.5-inch and 2.0-inch meters.
- Four signal relay towers.
- Billing software.

Project Benefits:

- According to Mr. Gravois, the City has reduced its water consumption from an average of 7 million gallons per month (84 million gallons per year) to 5 million gallons per month (based on spring 2012) due to the implementation of the use rated billing system. This will produce an annual water savings of approximately 24 million gallons of water.
- Mr. Gravois further stated that this water savings had likely resulted in cost savings due to decreased production at the City's drinking water plant. However, he indicated that it would be possible to collect this information.

Project Cost/Benefit Calculations:

- This project is expected to produce savings of 960 gallons of water per dollar invested over a 20 year project life.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/9/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
6 - Dallas	LA	City of Carencro	CS221750-01

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: ME

Total SRF Loan Amount: $599,475

ARRA Loan Amount: $599,475

GPR Category Loan Amount: WE - $599,475

Principle Forgiveness Amount: $599,475

Loan Payback Period:

General Project Description:

The City of Carencro (City) has installed an automatated meter reading system at the majority of its service connections.

Primary Environmental Benefits:

The new system provides real-time flow monitoring at each service connection which allows the City to rapidly identify leaks and water use issues.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was identified.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Carencro	Jay Castille, City Manager	Phone: (337) 896-8481 E-mail:

Notes: Interviewed on 3/6/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Orion System Meter (Source: http://www.badgermeter.com/Water/Water-AMA-AMI-AMR/ORION.aspx).

Project Narrative

The City has a population of approximately 10,000 residents and provides potable water distribution for approximately 3,000 potable water service connections. The City's existing meter system involved sending individuals out to each service connection to manually read meters. These readings were then collated, a quality assurance check was performed, and the customers were billed. The process, start to finish, would take approximately two weeks. In the summer of 2010, the City undertook a project to replace their existing meter infrastructure with an automated system.

The project consists of the installation of an Automatic Meter Reading and Advance Meter Infrastructure (AMRI AMI) system throughout the City that will monitor water consumption values on a daily basis. The AMRI AMI system provides real time monitoring of the entire potable water distribution system. The system is utilized to detect leaks or issues in the distribution system. In addition, the system allows the City to automatically identify service connections where there may be a water use issue (e.g., leaking water closet, leaking pipes, etc.) and communicate the issue to the customer. The detection of leaks utilizing this system reduces the total time of City staff spends responding to customer service calls.

Project Components and Associated Costs:

The total project cost was approximately $500,000. Itemized costs for project components are as follows:

- 2,500 Orion System residential water meters and wireless transmitters, manufactured by Badger Meter ($180 per meter and transmitter).
- 500 Orion System commercial water meters and wireless transmitters, manufactured by Badger Meter ($250 per meter and transmitter).
- One laptop with Orion System Software and receiver, manufactured by Badger Meter ($25,000).

Project Benefits

According to the project contact, Jay Castille, the City has not yet evaluated the water and environmental benefits realized by the project. He stated that collecting that information would not be possible at this time. However, the City developed the following environmental benefit estimates prior to undertaking this project. The project contact believes these estimates will be largely consistent with realized benefits.

- Based upon readings obtained in 2007, the City currently treats approximately 485 MG per year of potable water. The City presently has about 65 MG per year of losses. After the first year of service from the AMRI AMI system, the City anticipates the improved accuracy of metered consumption values will increase by approximately 20 percent, which will result in increased billings to the consumers. Reduction in water production will occur as accurate volumes of water delivered to the customers are properly documented and billed. Effective repairs on leaks through early detection will additionally aid in conserving large volumes of water. The City of Carencro assumes that the increased billings through more accurate readings will encourage consumers to use less water through a variety of conservation methods. The reduced usage will result in a lower production rate for the City. Lower production rates will in turn result in decreased energy and chemical consumption costs to the City.
- In addition to the reduction in production costs, the AMRI AMI system will help to reduce the negative effects of the manual reading system on the environment. With the current system, the City of Carencro uses three pick-up trucks for three days (8 hours per day) to collect the readings from all meters. A large majority of the time, the meter reader's vehicle remains parked and idling. An average passenger vehicle consumes approximately 0.25 gallons of fuel and produces approximately 1.2 pounds of greenhouse gases per hour while idling. Using these numbers, the current meter reading system in Carencro consumes approximately 220 gallons of fuel and produces 1036 pounds of green house gases per year. The proposed system will eliminate 100 percent of these negative effects of idling vehicles during the meter reading process.

Project Cost/Benefit Calculations

- Due to the lack of detailed costs and savings, it is not possible to compute the cost/benefit calculations.
- Over a 20 year project life, this project is anticipated to save approximately 1,700 gallons of water per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/11/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/27/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
6 - Dallas	LA	Town of Killian	CS221455-01

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: ME

Total SRF Loan Amount: $110,777

ARRA Loan Amount: $110,777

GPR Category Loan Amount: WE - $110,777

Principle Forgiveness Amount: $110,777

Loan Payback Period: 0 Years

General Project Description:

The City of Killian (City) purchased and installed 282 new water meters with wireless data transmitters. These meters can be read remotely.

Primary Environmental Benefits:

The installation of meters allows the City to charge water and sewer users based on the quantity of service utilized, rather than a flat access fee, which will increase the efficiency of water use by service users.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Alvin Fairburn & Associates, LLC	Shawn Hima, Project Manager	Phone: (225) 665-1515 E-mail: shawn@alvinfairburn.com

Notes: Interviewed on 4/11/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Project Narrative

The City has a service area with 282 potable water service connections. This project involved installing water meters at each service connection. Previously, these connections had been unmetered and the City charged a flat service fee for water and sewer use. With the new meters, the City will instead charge users based on usage rates which incentivizes efficient water use by end users. The meters are equipped with wireless transmitters which send meter data to the City's automated billing software. Construction on the project began in February 2010 and was completed in January 2011.

Project Components and Associated Costs:

The total project cost was approximately $155,000. Itemized costs for project components are as follows:

- Two hundred eighty five 3/4-inch diameter water meters ($197 per meter).
- Two 6-inch diameter water meters ($4,000 per meter).
- One hand-held meter data collection device ($4,720).
- Vehicle mounted data collection device ($1,860).
- Billing generator software ($5,000).

Project Benefits

- According to the project contact, Shawn Hima, prior to undertaking this project the City did not monitor water usage. Mr. Hima also indicated that no water savings estimates were available.

Project Cost/Benefit Calculations

- In the absence of any benefits information, it is not possible to compute estimates of project cost/benefit ratios or payback periods.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/11/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
6 - Dallas	LA	Town of Vinton	CS221455-01

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: ME

Total SRF Loan Amount: $1,200,000

ARRA Loan Amount: $1,200,000

GPR Category Loan Amount: WE - $1,200,000

Principle Forgiveness Amount: $1,200,000

Loan Payback Period: 0 Years

General Project Description:

The Town of Vinton (Town) has installed water meters at each of their potable water service connections throughout the Town and an automated meter reading system.

Primary Environmental Benefits:

The installation of meters allows the Town to charge water and sewer users based on the quantity of service utilized, rather than a flat access fee, which will increase the efficiency of water use and disposal by service users.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Meyer & Associates, Inc.	Wayne Harris, Engineer	Phone: (337) 625-8353 E-mail: wharris@meyerassociates.com

Notes: Interviewed on 4/25/2012

Entity	Contact Name and Title	Contact Phone Number / Email
City of Vinton	Terry Vice, Public Works Director	Phone: (337) 589-7453 E-mail: pwdirector@cityofvinton.com

Notes: Interviewed on 4/30/2012

Project Narrative

The Town has a population of approximately 4,000 residents served by approximately 1,500 water and sewer connections. This project involved the installation of a complete water meter assembly on existing service piping within the Town's existing water distribution system. Previously, these connections had been unmetered and the Town charged a flat service fee for water and sewer use. With the new meters, the Town will instead charge based on usage, which incentivizes efficient water use by end users. The meters are equipped with wireless transmitters which send meter data to the Town's automated billing software via relay towers. Construction on the project began in December 2009 and was completed in July 2011.

Project Components and Associated Costs:

The total project cost was $1,200,000. Itemized costs for project components were as follows:

- One thousand six hundred fifty six 3/4-inch diameter water meters ($494 per meter).
- Eleven 1-inch diameter water meters ($700 per meter).
- Twenty nine 2-inch diameter water meters ($1,500 per meter).
- Three laptops with radio receivers and meter data processing software ($38,000).

Project Benefits

- Several unsuccessful attempts were made to contact the Town to request project benefits data. According to the Business Case, this project was anticipated to reduce potable water usage between 20 percent and 60 percent. Assuming a typical per capita water use of 100 GPD and a 20 percent reduction in water use, the anticipated reduction in water use due to the project is approximately 80,000 GPD (29 MG per year).

Project Cost/Benefit Calculations

- Over a 20 year project life, the anticipated reduction in water use is approximately 487 gallons per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/8/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/27/2012

GPR Technical Project Information Reports

EPA REGION 6

New Mexico

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
6 - Dallas	NM	Incorporated County of Los Alamos	ARRA CWSRF 09

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: RE

Total SRF Loan Amount: $385,937

ARRA Loan Amount: $150,000

GPR Category Loan Amount: WE - $150,000

Principle Forgiveness Amount: $0

Loan Payback Period: 20 Years

General Project Description:

The Incorporated County of Los Alamos (County) has undertaken a project to construct an effluent pump station at the Los Alamos Wastewater Treatment Plant (Facility) in order to transmit the effluent to locations within the Facility for re-use as process water.

Primary Environmental Benefits:

This project will reduce consumption of groundwater resources at the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Los Alamos County	Clay Moseley, Project Manager	Phone: (505) 662-8271 E-mail: clay.moseley@lacnm.us

Notes: Interviewed on 4/23/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Project Narrative

The County owns and operates the Facility which provides sewage treatment for the residents of Los Alamos County. This project involves the construction of a pump station at the end of the Facility's liquid treatment train which distributes 500 GPM of effluent to locations within the Facility for use as process water. For example, effluent is re-used on-site in pressure washers at the belt filter press. Prior to this project, the system utilized groundwater from the on-site potable water system as process water. Use of recycled water reduces the Facility's consumption of the potable water. Construction on the project was completed in early 2011.

Project Components and Associated Costs:

The total project cost was $383,000. Itemized costs for project components were unavailable at the time of the interview. An list of project components is as follows:

- Two 11 hp pumps manufactured by HOMA Pump.
- One 300 gallon pneumatic tank.
- One MIOX disinfection system.
- Distributional piping.

Project Benefits

- According to the project contact, Clay Moseley, the project reduces the Facility's consumption of groundwater by approximately 10 million gallons per year.
- Additionally, an unspecified quantity of electricity is saved by avoiding the need to pump groundwater from a 2000 ft deep well. Savings associated with this benefit were not available to Mr. Moseley at the time of the interview.

Project Cost/Benefit Calculations

- The expected water saved over a 20 year project life is projected to be approximately 1,300 gallons of water per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/30/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/22/2012

GPR Technical Project Information Reports

EPA REGION 6

Oklahoma

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
6 - Dallas	OK	Perkins Public Works Authority	ORF-09-0002-CW

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

WE - Water Efficiency

Other GPR Category:

GPR Subcategory: EP, RE

Total SRF Loan Amount: $7,225,000

ARRA Loan Amount: $2,000,000

GPR Category Loan Amount: EE - $1,140,000

WE - $110,000

Principle Forgiveness Amount: $2,000,000

Loan Payback Period: 20 Years

General Project Description:

The Perkins Public Works Authority (Authority) has undertaken a project to replace its existing controlled discharge lagoon system with a new mechanical wastewater treatment plant (Facility).

Primary Environmental Benefits:

This project will reduce electricity consumption and potable water consumption at the new wastewater treatment plant (Facility) relative to the other design alternatives which were considered by the Authority.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Stillwater Press News. Retrieved 6/30/2012. <http://www.stwnewspress.com/environment/x1402470010/Perkins-fine-tunes-wastewater-treatment>.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Myers Engineering Consulting Engineers, Inc.	Jeremy Steeley, Project Manager	Phone: (405) 755-5325 E-mail: jeremys@mece.us.com

Notes: Interviewed 3/8/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

The Authority previously owned and operated a controlled discharge lagoon which provided wastewater treatment services to the City of Perkins. The Authority serves approximately 2,440 residents. This project involved the construction of a new wastewater treatment plant which replaced the existing lagoon system. The new system is a sequencing batch reactor (SBR). The project consisted of constructing a 0.5 MGD SBR process, a 0.16 MG digester basin, headworks consisting of inflow meter, bar screen, and grit chamber, a 1.8 MG flow equalization basin, a main lift station with energy efficient VFD pumps, an ultraviolet disinfection unit, 24-inch sewer outfall line, sludge handling/processing units, effluent water recycle system, laboratory building and all necessary energy efficient instrumentation and appurtenances. The new Facility provides the Authority with the additional capacity to meet projected population growth and treat industrial waste as well as municipal waste. Construction on the project began in March 2010 and was completed in November 2011. The project contact, Jeremy Steeley, provided a general description of the new facility; however, cost data, benefits information, and operational data were not available. The project Business Case was the primary information source of benefits data. The Facility began operations in August 2011.

Project Components and Associated Costs:

The total project cost was unavailable. The available project component and cost information is as follows:

- Installation of VFD-equipped pumps, a SCADA, and new flow proportional controls ($1,140,000).
- New reclaimed water system which recycles effluent on-site at the facility ($110,000).

Project Benefits

- According to the Business Case, the VFDs have the potential to save approximately $300 per year per pump in electricity costs. Additional energy efficiency benefits information was unavailable.
- According to the Business Case, the reclaimed water system will reduce potable water use at the new plant by approximately 1,000,000 MG per year. The estimated value of this savings is $3,000 per year.

Project Cost/Benefit Calculations

- Over a 20 year project life, this project is anticipated to save 16 gallons of water per dollar invested. Based only on the water efficiency portion of the GPR loan, this project will save 182 gallons of water per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/30/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25/2012

GPR Technical Project Information Reports

EPA REGION 7

Iowa

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
7 - Kansas City	IA	City of Boyden	CS1920472 01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC

Total SRF Loan Amount: $116,000

ARRA Loan Amount: $116,000

GPR Category Loan Amount: EE - $116,000

Principle Forgiveness Amount: $23,000

Loan Payback Period: 20 Years

General Project Description:

The purpose of the project is the upgrade and rehabilitation of the City of Boyden's (City) lift station. The lift station conveys untreated sewage to the City's Wastewater Treatment Facility (Facility).

Primary Environmental Benefits:

The primary environmental benefit is reduced energy consumption at the lift station through improved pumping efficiency.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Sioux County Index-Reporter, Hull, Iowa, 2010. Article Retrieved on 1/11/2012. <http://50.57.90.178/view_article.html?articleId=SXC0901201000101>

Other Information Obtained ☒ **Yes** ☐ **No**

Sources: Contact interview.

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Boyden	Cody Rensink, Public Works Director	Phone: (712) 725-2371 E-mail:

Notes: Interviewed on 1/12/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

The purpose of the project is the upgrade and rehabilitation of the City's sewer system via improvements to the City's lift station. The lift station has a design flow of 0.729 MGD. The Facility services a population of 810 residents. The improvements consist of the construction of a new main lift station with submersible pumps and the replacement of 1,800 ft of force main. Increased energy efficiency is achieved by use of high efficiency pumps with VFDs and use of a larger diameter force main.

The City's previous lift station utilized two 15 hp pumps which were each rated separately at 300 GPM. When pumping into the existing 6-inch diameter force main, the pumping capacity of the original lift station was limited to 330 GPM due to excessive head loss. The lift station upgrade involved replacing the lift station vault, purchasing two 10 hp Flygt VFD submersible pumps and pump controls, and replacing 1,800 ft of 6-inch diameter force main with an 8-inch diameter PVC force main. The new 10 hp pumps increased pumping capacity to 550 GPM for each pump as configured.

Mr. Rensink noted that the new lift station has reduced the frequency of bypasses at the Facility. The City has not tracked energy usage since the new lift station began operations. The cost of purchasing and installing the pumps, pump controls, and the electrical system was approximately $100,000. Project construction was completed in August 2010.

The improved efficiency allows the operator to use one lower horsepower hp pump to meet the pumping demand instead of two higher hp pumps. Previously, two 15 hp pumps reached a total combined capacity of 330 GPM.

Project Components:

- 10 ft x 10 ft concrete lift station vault.
- Two 10 hp Flygt Submersible Pumps with VFD and N-Series impellers.
- Pump controls.
- 1,800 feet of 8-inch PVC force main.
- Electrical system.

Project Benefits

- The project design engineer estimated an electricity savings for the lift station at 33 to 50 percent per month.
- Mr. Rensink noted that the frequency of pump station bypasses has been reduced.

Project Cost/Benefit Calculations

- Due to the lack of sufficient data, it is not possible to compute the cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 1/17/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 6/17/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
7 - Kansas City	IA	City of Cascade	CS1920483 01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC

Total SRF Loan Amount: $173,000

ARRA Loan Amount: $173,000

GPR Category Loan Amount: EE - $173,000

Principle Forgiveness Amount: $36,000

Loan Payback Period: 20 Years

General Project Description:

This project will upgrade and rehabilitate one of the City of Cascade's (City) three lift stations. These three lift stations convey untreated sewage to the Cascade Wastewater Treatment Facility (Facility). The purpose of the project is to increase the capacity of one lift station using energy-efficient pumps.

Primary Environmental Benefits:

The primary environmental benefit is reduced energy consumption at the lift station.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: City of Cascade Public Work Website. Retrieved on 1/11/2012. <http://www.cityofcascade.org/public-works/sewer-department.php>

Other Information Obtained ☒ **Yes** ☐ **No**

Sources: ABS Sewage Pump Technical Info Sheet. Retrieved 1/31/2012. <http://www.visserssales.com/pdf/abs/afp9.pdf>

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Cascade	Phil Gayle, City Manager	Phone: (563) 495-2413 E-mail:

Notes: Interviewed on 1/30/2012 and 1/31/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

City of Cascade Wastewater Treatment Plant (Source: City of Cascade).

Project Narrative

The City provides wastewater collection and treatment for approximately 570 residents and discharges treated effluent to the North Fork of the Maquoketa River. The collection system consists of 120 manholes, 9 miles of gravity flow sewer line, and 3 lift stations. The treatment plant is designed to treat 0.25 MGD. The average daily flow is 0.19 MGD.

This project upgraded and rehabilitated one of the City's three lift stations. These three lift stations convey untreated sewage to the Facility. The purpose of the project is to increase the capacity of the one lift station by installing new, energy-efficient pumps. Construction on the upgraded lift station was completed in 2010.

Project Components and Associated Costs:

- Two 6 hp ABS Submersible Sewage Pumps, Model No. AFP[K]1041.
- One Control Work F6 Controller.
- One valve box.
- One stationary, gas powered backup power generator.

Project Benefits

- Based on electricity use data provided by Mr. Gayle, electricity consumption at the lift station has declined 29 percent from 2008 to 2011.
- According to Mr. Gayle, the new pumps are significantly easier to operate and maintain.

Project Cost/Benefit Calculations

Table 1. Electricity consumption at the upgraded lift station in 2008 and 2011 (provided by the project contact)

Electricity Consumption (kWh)					
Year	**June**	**July**	**August**	**September**	**Average**
2008	690	580	690	650	653
2011	533	427	467	438	466
Percent Reduction	23%	26%	32%	33%	29%

Draft Prepared By: Matthew Reusswig (PG Environmental, LLC) on 1/31/2012

Draft Reviewed By: Craig Blett (PG Environmental, LLC) on 2/2/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
7 - Kansas City	IA	City of Newton	CS1920478 01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC

Total SRF Loan Amount: $605,000

ARRA Loan Amount: $605,000

GPR Category Loan Amount: EE - $605,000

Principle Forgiveness Amount: $136,000

Loan Payback Period: 20 Years

General Project Description:

The project consists of improvements to the activated sludge aeration system at the City of Newton's (City's) Water Pollution Control Plant (Facility). The project also included the installation of a fine bubble aeration system to replace the existing submerged turbine aeration system.

Primary Environmental Benefits:

The aeration system improvements are expected to significantly reduce electricity consumption and O&M at the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: http://www.foxeng.com/news/aeration-replacement and http://www.foxeng.com/sustainability

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Fox Engineering	Steve Van Dyke, Project Manager	Phone: (515) 233-0000 E-mail: sav@foxeng.com

Notes: Interviewed on 2/21/2012

Entity	Contact Name and Title	Contact Phone Number / Email
City of Newton WPCP	Scott Hindman	Phone: (641) 792-3422 E-mail: ScottH@newtongov.org

Notes: Interviewed on 3/13/2012 and received additional information via email

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Fine Bubble Aeration Diffusers (Source: http://www.foxeng.com/news/aeration-replacement).

Project Narrative

The Facility was constructed in the mid-1980s and included a two-stage roughing filter/activated sludge secondary treatment system. The original system which consisted of four aeration tanks equipped with 100 hp draft tube submerged turbine aeration system, had reached the end of its design life. The City hired FOX Engineering in 2008 to provide design, bidding, and construction administration services associated with the replacement of the activated sludge aeration system at the Facility. FOX Engineering completed a study and found that the potential electricity savings associated with a fine bubble aeration system would pay back the projected project costs in approximately eight years. In addition to the new fine bubble aeration system, the project included five new positive displacement blowers installed inside insulated enclosures for sound mitigation. The construction contract was awarded to Grundman-Hicks in December 2009 and the project was completed on November 2010.

Project Components and Associated Costs:

- The fine bubble diffuser aeration system was manufactured by ITT Sanitaire in Pewaukee, WI ($49,700).
- The new positive displacement blowers, Model No. G5GM25S, were manufactured by Aerzen USA Corporation in Coatsville, PA ($111,600).
- Demo/sludge ($40,000).
- Trenching and backfill ($10,000).
- Seeding ($1,700).
- Concrete and rebar ($3,000).
- Block/Brick/Lintel ($2,300).
- Oxygen meters ($12,600).
- Process valves ($19,800).
- Process pipe and welding ($42,500).
- Pipe insulation ($6,800).

- Louvers / fans ($9,600).
- Electrical ($133,000).
- As indicated in a FOX Engineering news article, the final project total cost, including engineering, administration and construction costs, was approximately $610,000. Given the $136,000 ARRA forgivable loan (grant), the total cost paid by the City of Newton is only about $474,000, thereby significantly reducing the anticipated payback period.

Project Benefits

- According to Mr. Steve Van Dyke, the project has significantly reduced utility costs at the Facility and a reduction in operation and maintenance costs has been realized. According to a news release provided by Mr. Scott Hindman (Superintendent, Newton WPCP), the City saves $49,600 per year in utility costs.
- The project qualified for a custom rebate from Alliant Energy for $73,829.

Project Cost/Benefit Calculations

- According to Mr. Steve Van Dyke and a study completed by FOX Engineering, the potential electricity savings associated with a blowers and fine bubble aeration system would pay back the projected project costs in approximately eight years. The simple payback period on the GPR funding is approximately five years.

Prepared By: Jared Richardson (PG Environmental, LLC) on 2/16/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
7 - Kansas City	IA	City of Osage	CS1920503 01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: WI

Total SRF Loan Amount: $572,000

ARRA Loan Amount: $572,000

GPR Category Loan Amount: EE - $572,000

Principle Forgiveness Amount: $114,000

Loan Payback Period: 20 Years

General Project Description:

The City of Osage (City) has undertaken a project to install a wind turbine to supply electricity to the wastewater treatment plant (Facility).

Primary Environmental Benefits:

The wind turbine project will be used to off-set energy consumption demand for the City.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information obtained from internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Osage Municipal Utilities	Dennis Fannin, General Manager	Phone: (641) 832-3731 E-mail: d.fannin@osage.net

Notes: Interviewed on 2/21/2012 and sent additional email request

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Wind Turbine (Source: City of Osage).

Project Narrative

The project involved the construction of a 1.5 MW General Electric (GE) wind turbine located 0.5 miles west of the center of the City. The power generated from the wind turbine is used to offset the electricity demand of the City's Facility. The project contact, Dennis Fannin, commented that the project has generated community enthusiasm for additional green projects. The project was completed and the wind turbine commissioned in December 2009.

Project Components and Associated Costs:

- 1.5 MW GE wind turbine and associated components ($2,385,150).
- Erection of the wind turbine ($599,722.50).
- Access road improvements ($115,710).

Project Benefits:

- According to Mr. Dennis Fannin, the wind turbine has offset the City electricity demand from Dairyland Power Cooperative by 8.5% over the past two years.
- Two full-time positions at the City have been added to provide adequate operation and maintenance of the wind turbine.

Project Cost/Benefit Calculations

- According to Mr. Dennis Fannin, a feasibility study was conducted for the project and estimated that the payback period will exceed the service life of the project.

Prepared By: Jared Richardson (PG Environmental, LLC) on 2/22/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
7 - Kansas City	IA	City of Dyersville	CS1920475 01

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC

Total SRF Loan Amount: $1,488,000

ARRA Loan Amount: $1,371,069

GPR Category Loan Amount: EE - $1,488,000

Principle Forgiveness Amount: $296,000

Loan Payback Period: 20 Years

General Project Description:

The City of Dyersville (City) has undertaken a project to make a series of improvements at the Dyersville Sewage Treatment Plant (Facility). These improvements include upgrades to the motors of the Facility's various pumping systems, installation of new solids handling systems, installation of a geothermal HVAC system.

Primary Environmental Benefits:

The project reduces energy consumption at the Facility and reduces ammonia concentrations in the Facility's effluent.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: IDNR/SRF Supplemental Intended Use Plans ARRA 2009. Retreived 3/12/2012. <http://www.iowasrf.com/program/clean_water_loan_program/>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Dyersville	Mick Michel, City Manager	Phone: (563) 875-7724 E-mail: mmichel@cityofdyersville.com

Notes: Interviewed on 4/30/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Dyersville Sewage Treatment Plant Orbital Oxidation Ditch (Source: http://www.dyersvillecommercial.com/news/top_news/wastewater-again-hot-topic-for-council/article_79f99c24-8955-11e1-ad1b-0019bb30f31a.html?mode=image&photo=0).

Project Narrative

The City owns and operates the Facility which has a design flow of 520,000 GPD and provides sewage treatment for approximately 6,700 residents. The City has undertaken projects to install new pumping systems with VFD, to make improvements to the solids handling system, to install a new geothermal heating and cooling system, and to install an effluent reuse system. Recycled water will be produced onsite for use as process water. The project contact, Mick Michel, was able to provide a description of the project but specific and quantitative information on project costs and benefits was unavailable to him during his interview and subsequent contact. Construction on the project started in February 2010. The project is complete but the date of completion was unknown.

Project Components and Associated Costs:

Project cost information was unavailable. The available information on project components is as follows:

- Effluent water reuse system.
- Diffused sludge aeration system.
- VFDs for digester aeration blowers.
- Sludge storage area with two year holding capacity.
- Geothermal HVAC system for sludge dewatering building.
- Variable speed controls for aeration basin blowers.
- Automatic level control on aeration tank.

Project Benefits

- According to the Iowa Department of Natural Resources (IDNR) State Revolving Fund Intended Use Plan, this project is anticipated to save 2,600,000 gallons of water per year, reduce diesel fuel consumption of 3,060 gallons per year, and reduce electricity consumption by 140,700 kWh per year.
- According to Mr. Michel, the City anticipates saving $50,000 per year in sludge hauling costs. Mr. Michel did not have access to additional benefits information at the time of the interview.
- Assuming an electricity price of $0.11 per year, the value of an electricity savings for 140,700 kWh is approximately $15,500 per year.

Project Cost/Benefit Calculations

- Based on anticipated cost savings of $65,500 per year, the simple payback period for the loan exceeds a 20 year project life.
- Over a 20 year project life, the anticipated electricity savings is 1.9 kWh per dollar invested.
- Over a 20 year project life, the anticipated water savings is 35 gallons of water per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/19/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

GPR Technical Project Information Reports

EPA REGION 7

Kansas

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
7 - Kansas City	KS	Colby	C20 1653 01A

Primary GPR Category:
WE - Water Efficiency
Secondary GPR Category:
Other GPR Category:
GPR Subcategory: RE

Total SRF Loan Amount: $70,500
ARRA Loan Amount: $70,500
GPR Category Loan Amount: WE - $70,500
Principle Forgiveness Amount: $35,250
Loan Payback Period: 20 Years

General Project Description:
The City of Colby (City) has installed an irrigation pump station so that treated effluent from the wastewater treatment plant (Facility) can be used to irrigate a nearby baseball field.

Primary Environmental Benefits:
This project reduces the City's reliance on potable water and scarce groundwater resources.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**
CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**
SRF Business Case Information Obtained ☐ **Yes** ☒ **No**
Internet Search Performed ☒ **Yes** ☐ **No**
Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**
Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Colby	Carolyn Armstrong, City Manager	Phone: (785) 460-4410 E-mail: manager@cityofcolby.com

Notes: Interviewed on4/2/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Project Narrative

The City owns and operates the Facility with a treatment capacity of 2.0 MGD. According to the project contact, current average daily flows at the Facility are approximately 0.65 MGD. The project involves the installation of an effluent reuse pump station which will convey treated effluent to a nearby baseball field. The field requires irrigation, with an average daily demand of 46,700 gallons per day. Prior to installation of the effluent reuse pump station, the fields were irrigated exclusively with potable water sources drawn from the Ogallala Aquifer. Construction on this project began in April 2009 and reached substantial completion in late 2009.

Project Components and Associated Costs:

The total project cost was approximately $70,500. Itemized project component capital costs are as follows:

- One 2,000 gallon buried fiberglass tank ($11,300).
- Concrete tank slab; materials and installation ($13,000)
- Two Steiner P612 sodium hypochlorite feed pumps with VFDs ($2,400).
- One Gorman Rupp CP1600 irrigation pump ($4,000).

Project Benefits:

- According to the project contact, Carolyn Armstrong, prior to installation of the irrigation system the City was using an average of 46,700 gallons of potable water per day to irrigate the baseball field. Since, the system came online, the City has reduced its potable water usage by approximately half. This results in an expected annual water savings of approximately 8.5 million gallons per year. According to Ms. Armstrong, potable water costs $1 per 1,000 gallons which equates to an annual cost savings of $8,500 per year.

Project Cost/Benefit Calculations:

- Assuming annual savings of $8,500 per year for potable water purchases, the payback period of this loan over a 20 year project life is approximately 8 years.
- Based on the first month of operation, the expected water savings over a 20 year project life is 2,400 gallons of water per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/7/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
7 - Kansas City	KS	Hutchinson	C20 1780 01A

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: GP

Total SRF Loan Amount: $5,700,000

ARRA Loan Amount: $5,200,000

GPR Category Loan Amount: EE - $5,101,500

Principle Forgiveness Amount: $3,068,553

Loan Payback Period: 20 Years

General Project Description:

The City of Hutchinson (City) has made improvements to its biosolids treatment system at the Hutchinson Wastewater Treatment Plant (Facility), including installation of new gas mixers and compressors for the system's digesters. In addition, the City has installed a new centrifuge and gravity belt thickener.

Primary Environmental Benefits:

This project reduces the quantity of sludge which must be hauled to disposal sites thereby reducing the quantity of energy required to dispose of the biosolids.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: City of Hutchinson Website. Retrieved 4/10/2012. <http://www.hutchgov.com/department/division.php?fDD=23-112>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Hutchinson	Reg Jones, Director of Public Works	Phone: (620) 694-1900 E-mail: regj@hutchgov.com

Notes: Interviewed on 4/2/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Hutchinson Wastewater Treatment Facility (Source: http://www.hutchgov.com/department/division.php?fDD=23-112).

Project Narrative

The City owns and operates the Facility, an 8.3 MGD activated sludge wastewater treatment plant, which provides wastewater collection and treatment for the City. Originally built in 1959, the Facility has undergone two major upgrades since that time. In 1984 the plant was upgraded to add the activated sludge process in addition to a set of existing trickling filters. In 2004, a second upgrade was completed in which two additional aeration tanks and an additional secondary clarifier were added, along with processes for removal of nitrates from the treated wastewater. The system currently treats an average daily flow of approximately 5 MGD.

The project involves several improvements to the Facility's solids handling system. First, gas mixers and gas compressors were installed on the Facility's four existing primary anaerobic digesters to improve gas production from the digesters. Second, a new gravity belt thickener and centrifuge were installed in order to produce dewatered sludge. Prior, the Facility did not dewater sludge and, instead, spent approximately $400,000 per year to haul liquid sludge to a neighboring facility for disposal. Reg Jones, the project contact, expressed appreciation for the loan and the manner in which ARRA/GPR money was distributed in Kansas. Construction on this project began in January 2010 and reached substantial completion in December 2010.

Project Components and Associated Costs:

The total project cost was $5,872,000.

- One 175 GPM centrifuge, manufactured by GEA Westfalia, one 250 GPM per meter belt thickener, manufactured by BDP Industries, and a new structure to house them ($2,291,000).
- An unspecified number of gas compressors and gas mixers on the four existing anaerobic digesters ($1,484,000).

Project Benefits:

- Improvements to the sludge handling system reduced the water content and volume of the biosolids, which resulted in a substantial reduction in the quantity of hauling required to dispose of the solids. In 2009, the City spent $380,624 on sludge hauling and, in 2010, spent $407,120. The 2011 costs, after the project improvements began operation, were approximately $213,000. The hauling savings is approximately $180,000 per year.
- During the winter, when harvested natural gas is used to heat the Facility's administrative buildings, the system produced an average of 600,000 cubic feet per month (March 2009 through November 2010). After the system began operations, between December 2010 and February 2012, the system produced an average of 656,000 cubic feet per month of natural gas, which is an increase of 393,000 cubic foot in annual production. The cash value of increased production is approximately $323 per month, or $2,260 per year.

Project Cost/Benefit Calculations

- Assuming an estimated annual savings of $182,000 per year, the simple payback period for this loan exceeds the 20 year project life.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/1/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
7 - Kansas City	KS	Oberlin	C20 1529 01A

Primary GPR Category:
EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: SO

Total SRF Loan Amount: $136,255

ARRA Loan Amount: $131,050

GPR Category Loan Amount: EE - $131,050

Principle Forgiveness Amount: $46,802

Loan Payback Period: 20 Years

General Project Description:

The City of Oberlin (City) has undertaken a project to improve the City's wastewater treatment plant (Facility) to include the purchase and installation of solar powered lagoon mixers in the Facility wastewater treatment lagoon.

Primary Environmental Benefits:

The project will reduce electricity consumption at the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ Yes ☒ No

CWSRF Benefits Reporting Information Obtained ☒ Yes ☐ No

SRF Business Case Information Obtained ☐ Yes ☒ No

Internet Search Performed ☒ Yes ☐ No

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ Yes ☒ No

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Oberlin	Karen Larson, City Clerk	Phone: (785) 475-2217 E-mail: klarson@oberlinkansas.gov

Notes: Contacted on 4/2/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

The Facility provides sewage treatment for 1,770 residents and has a design flow of 335,000 GPD. The City was contacted on two occasions and was unable to provide information in response to those contacts. Available information on the project is limited to that reported in the CWSRF Benefits Reporting database There is states that the project entailed the purchase and installation of solar powered mixers for the Facility's wastewater treatment lagoon system. This will alleviate odor and treatment problems as well as eliminate the use of chemicals for odor control. Work on the first contract started in February 2010 and the last contract was completed in August 2010.

Project Components and Associated Costs:

- According to CWSRF Benefits Reporting, the project involves the installation of an unspecified number of lagoon solar mixers. No information on project costs is available.

Project Benefits

- No information on project benefits is available.

Project Cost/Benefit Calculations

- Absent quantitative information, it is not possible to compute project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/19/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

GPR Technical Project Information Reports

EPA REGION 7

Missouri

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
7 - Kansas City	MO	City of Paris	C295552-01

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: RE

Total SRF Loan Amount: $2,311,000

ARRA Loan Amount: $1,579,837

GPR Category Loan Amount: WE - $1,591,000

Principle Forgiveness Amount: $1,155,500

Loan Payback Period: 20 Years

General Project Description:

The City of Paris (City) has undertaken a project to convert the treatment processes at the Paris Wastewater Treatment Plant (Facility) from an oxidation ditch with surface discharge to a controlled discharge treatment lagoon with all effluent being recycled as irrigation water.

Primary Environmental Benefits:

This project will reuse all of the treated effluent produced by the City.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained in the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Paris	Phillip Shatzer, Superintendent of Operations	Phone: (660) 327-4630 E-mail: superintendent@parismo.net

Notes: Interviewed on 4/9/2012

Entity	Contact Name and Title	Contact Phone Number / Email
Klinger and Associates	Mark Bross, Senior Project Engineer	Phone: (573) 221-0020 E-mail: mcb@mail.klinger.com

Notes: Interviewed on 4/9/2012

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Water Reuse Irrigation Field (Source: City of Paris).

Project Narrative

The City owns and operates the Facility which is capable of treating 200,000 GPD of wastewater. The Facility's existing treatment train consists of an oxidation ditch, two clarifiers, an aerobic digester, a sludge holding tank, and sludge drying beds. Average daily flows are 150,000 GPD and treated effluent is discharged to the Mid-fork of the Salt River. This project entails replacing the existing treatment train with a 37-acre, two-cell treatment lagoon and the construction of a new lift station. Effluent will be pumped to four hay fields for reuse as irrigation water. Construction on the project began in May 2010 and was completed in June 2011. Operations did not begin until the spring of 2012.

Project Components and Associated Costs:

The total project cost was approximately $3,020,000. Some itemized project components are as follows:

- 30,000,000 gallon, two-cell treatment lagoon ($1,115,500).
- Lift station with two 1,100 GPM turbine pumps and water irrigation equipment ($455,000).

Project Benefits

- Specific benefit numbers regarding electrical savings were not available to Mr. Shatzer at the time of the interview but he estimated that power savings are approximately $50,000 per year.
- This project reduces surface water discharges by 55 MG per year by reusing treated effluent to irrigate hay and orchard grass fields. The production of hay at the irrigation fields does not generate revenue for the City.

Project Cost/Benefit Calculations

- Based on annual savings of $50,000 per year, the simple payback period of this project exceeds a 20 year project life.
- Over a 20 year project life, this anticipated water savings of this project are approximately 690 gallons per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/15/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/27/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
7 - Kansas City	MO	Columbia	C295361-08

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC, GP

Total SRF Loan Amount: $62,335,000

ARRA Loan Amount: $17,509,000

GPR Category Loan Amount: EE - $17,509,000

Principle Forgiveness Amount: $0

Loan Payback Period: 20 Years

General Project Description:

The City of Columbia (City) is undertaking a project to upgrade the Columbia Regional Wastewater Treatment Plant (Facility): Included are construction of additional activated sludge facilities, installation of high efficiency blowers and pumps, new generators for converting methane to electricity, and new biosolids dewatering equipment. The purpose of this project is to enhance the energy conservation and efficiency capabilities of the Facility.

Primary Environmental Benefits:

The primary environmental benefits of this project include increasing the energy efficiency of the processes at the Facility and reducing the energy consumption per gallon of wastewater treated.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Black & Veatch 1 March 2010 New Release. Retrieved 1/25/2012. <http://www.bv.com/wcm/press_release/03012010_6669.aspx>

Other Information Obtained ☒ **Yes** ☐ **No**

Sources: Water and Wastewater Plant Directory. Retrieved 1/25/2012. <http://www.waterandwastewater.com/plant_directory/Detailed/46.html>

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Columbia	Steve Hunt, Environmental Services Director	Phone: (573) 874-7250 E-mail: sshunt@gocolumbiamo.com

Notes: Interviewed on 1/25/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Columbia Regional Wastewater Treatment Plant (Source: City of Columbia).

Project Narrative

The Facility has an average daily flow capacity of 25.2 MGD. The Facility provides wastewater treatment for a population of approximately 84,500 residents. The Facility's existing treatment train is composed of two bar screens, two primary settling basins, two aeration basins, two secondary clarifiers, and four constructed wetlands. Solids are collected from the primary and secondary clarifiers, dewatered, fed to an anaerobic digester. Liquid solids from the digester are trucked off-site for disposal.

The purpose of the project is to improve the energy efficiency at the Facility by making the following upgrades; additional activated sludge facilities, new high efficiency blowers and pumps, new generators for converting methane to electricity, and new biosolids dewatering equipment.

Project Components and Associated Costs:

Costs were not available. The following is a partial list of components

- Submerged, fine-bubble diffused aeration units that utilize single-stage centrifugal blowers with adjustable inlet guide vanes and variable diffuser vanes.
- Two new aeration basins will be constructed to supplement the existing aeration basin capacity and serve as anoxic treatment units.
- The existing system utilizes four-40 hp air-lift pumps to transport RAS from the secondary clarifiers to the aeration basins. These will be replaced with four-25 hp vertical end suction centrifugal pumps with VFDs.
- Two new 400 kW turbo-charged, after-cooled engine-generators with higher efficiency and larger capacity than existing units.
- A new centrifuge.

Project Benefits:

- The new fine bubble diffusion aeration system and blowers will reduce electricity demand at the Facility by 1,875,000 kWh annually.
- Building the two anoxic tanks, which naturally add alkalinity to the treatment system, will allow the Facility to remove nitrogen from its waste without the need for chemical additions of alkalinity. Under a process configuration which requires chemical addition of alkalinity, the City estimates it would need to transport approximately 1,365 tons of quicklime per year to the Facility from and off-site location.
- Replacing the existing RAS air lift pumps with more efficient vertical end suction RAS pumps will reduce the Facility's annual electricity demand by 400,000 kWh.
- Replacing the existing 240 kW generator with two new 400 kW generators will increase electrical production from harvested methane by 67 percent.
- By dewatering its anaerobic digester sludge, the Facility will reduce total vehicle carbon emissions, fuel costs, and vehicle miles driven by either City staff or contract haulers by 70%.
- The City estimates that the total cost savings of the project at $607,000 annually.

Project Cost/Benefit Calculations:

- The existing surface aerators consume 3,300,000 kWh of electricity each year. The power consumed to operate the new single-stage centrifugal blowers to aerate the wastewater in aeration basins is 1,425,000 kWh and represents a reduced power consumption of 57 percent compared to the existing surface aerators.
- Alkalinity addition with quicklime, at a rate of 3.5 pounds of calcium carbonate per pound of nitrate removed resulted in approximately 1,365 tons of quicklime added on an annual basis. At a current cost of $120 per ton of quicklime, there was a recurring annual cost of $163,800 per year for chemical alkalinity.
- The existing air lift blowers consume 1,100,000 kWh each year. The new VFD driven pumps will consume 700,000 kWh each year under average conditions. This represents a reduced power consumption of 36 percent compared to the existing air lift blowers.
- By dewatering the sludge with a new centrifuge, the volume of biosolids sent to disposal will decrease and the number of vehicles hauling biosolids from the Facility for disposal is reduced from ten liquid tanker trucks per day down to approximately three, 20-yard dump trucks per day. This represents a 70 percent decrease in total vehicle carbon emissions, fuel costs, and vehicle miles driven by either City staff or contract haulers.
- Based on annual savings of $607,000, the simple payback period on this project exceeds a twenty year project life.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 1/25/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
7 - Kansas City	MO	Harrisonville	C295365-05

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC

Total SRF Loan Amount: $7,300,000

ARRA Loan Amount: $3,000,000

GPR Category Loan Amount: EE - $1,650,000

Principle Forgiveness Amount: $0

Loan Payback Period: 20 Years

General Project Description:

The City of Harrisonville (City) has upgraded the Harrisonville Wastewater Treatment Plant (Facility). The project involves upgrading the aeration system of Facility's three aerobic digesters and the construction of a new extended aeration system.

Primary Environmental Benefits:

The project will reduce electricity consumption at the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: City of Harrisonville Website. Retrieved 5/14/2012. <http://ci.harrisonville.mo.us/index.aspx?nid=79>.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Harrisonville	Jerry Gibbs, Superintendent	Phone: (816) 380-8964 E-mail: jgibbs@ci.harrisonville.mo.us

Notes: Interviewed on 4/12/2012

Entity	Contact Name and Title	Contact Phone Number / Email
City of Harrisonville	Steve Woodring, Wastewater Superintendent	Phone: (816) 380-8960 E-mail: swoodring@ci.harrisonville.mo.us

Notes: Interviewed on 4/13/2012

Project Narrative

The City has upgraded the Facility to include upgrading the aeration system of the Facility's three aerobic digesters and the construction of a new extended aeration system. The City has upgraded the Facility in order to comply with new ammonia limits in their NPDES permit. The existing design capacity of the Facility was 3 MGD and has been increased to 8 MGD. Additional improvements included construction of a new headwords, aeration basin, secondary clarifier, and aerobic digester. In addition, coarse bubble diffusers were replaced with fine bubble diffusers in all three aerobic digesters. Construction on the project was completed in September 2011.

Project Components and Associated Costs:

The total project cost was approximately $7,000,000. Itemized energy efficiency project components are as follow:

- Fine-bubble diffusers were installed in three aerobic digesters.
- Three existing 75 hp centrifugal blowers were replaced with two 100 hp centrifugal blowers.
- One aeration basin.

Project Benefits

- Average electricity consumption by the Facility between October 2010 and November 2010 was 124,000 kWh. Average consumption between October 2011 and November 2011 was 106,000 kWh. This represents a savings of approximately 211,000 kWh per year valued at approximately $20,000.

Project Cost/Benefit Calculations

- Assuming annual savings of $20,000 per year, the simple payback period for this project exceeds a 20 year project life.
- Over a 20 year project life, this project will produce approximately 2.6 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/14/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

GPR Technical Project Information Reports

EPA REGION 7

Nebraska

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
7 - Kansas City	NE	City of Sidney	C317189

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $5,500,000

ARRA Loan Amount: $2,750,000

GPR Category Loan Amount: EE - $128,000

Principle Forgiveness Amount: $1,375,000

Loan Payback Period: 20 Years

General Project Description:

The City of Sidney (City) has undertaken a project at the Sidney Wastewater Treatment Plant (Facility) to remove their existing trickling filter and install a sequencing batch reactor. Project energy efficiency components include five blowers and two pumps with VFDs.

Primary Environmental Benefits:

The use of VFDs will reduce the electricity consumption at the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Olsson Associates	Joe Baxter, Engineer	Phone: (402) 463-0240 E-mail: jbaxter@olssonassociates.com

Notes: Interviewed on 4/16/2012

Entity	Contact Name and Title	Contact Phone Number / Email
Olsson Associates	Carlos Medina, Engineer	Phone: ( ) - E-mail: cmedina@olssonassociates.com

Notes: Interviewed on 4/18/2012

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

The City owns and operates the Facility which provides wastewater treatment for a population of approximately 6,400 residents. The Facility's design capacity is approximately 1.0 MGD. The existing secondary treatment system is composed of a trickling filter. This project consisted of the replacement the trickling filter with two new SBR basins, and a new dewatering building with belt filter press along with the VFD pumps and motors. According to the project contact, the City has had challenges meeting NPDES permit limitations for the Facility utilizing the trickling filter. The primary motivation of the project was to construct a functionally reliable wastewater treatment system. Construction on this project was completed in July 2010.

Project Components and Associated Costs:

- Two SBR cells including basins, three blowers with VFD units, electrical work, and piping ($1,941,000).
- One belt filter press ($284,000).
- Dewatering building, including mechanical equipment, electrical work, and building ($1,046,600).
- Two progressive cavity pumps with VFDs ($47,600).
- Two blowers with VFDs used in the Facility's aerobic digester (costs unavailable).

Project Benefits

- According to the project contact, Joe Baxter, the Facility's five blowers with VFDs use an estimated 1,380 kWh per day. Without VFDs, these blowers would use an estimated 1,587 kWh so that the VFDs save the City 207 kWh per day. According to Mr. Baxter, the cash value of these savings is approximately $6,800 per year. Energy savings information for the VFD-equipped pumps was not available at the time of the interview.

Project Cost/Benefit Calculations

- Based on savings of $6,800 per year, the simple payback period for the loan is approximately 19 years.
- Over a 20 year project life, this project is anticipated to save 12 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/15/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/19/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
7 - Kansas City	NE	Village of Platte Center	C311528

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: ME

Total SRF Loan Amount: $199,086

ARRA Loan Amount: $181,516

GPR Category Loan Amount: WE - $181,516

Principle Forgiveness Amount: $64,183

Loan Payback Period: 20 Years

General Project Description:

The Village of Platte Center (Village) has undertaken a project to install water meters on all Village potable water service connections.

Primary Environmental Benefits:

The installation of water meters allows the City to charge water and sewer users based on the quantity of service consumed, rather than a flat access fee, which will increase the efficiency of water use by service users.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
JEO Consulting Group	Mike Schultes, Engineer	Phone: (308) 381-7428 E-mail: mschultes@jeo.com

Notes: Interviewed on 4/17/2012

Entity	Contact Name and Title	Contact Phone Number / Email
Village of Platte Center	Karla Costello, Village Clerk	Phone: (402) 276-4052 E-mail: pcvillage1@frontier.com

Notes: Interviewed on 4/18/2012

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

The Village has a population of approximately 387 residents served by 184 water and sewer connections. This project involved installing water meters at each service connection. Previously, these connections had been unmetered and the Village charged a flat service fee for water and sewer use. With the new meters, the Village instead charges based on usage which incentivizes efficient water use by end users. The meters are equipped with wireless transmitters that send meter data to the Village's automated billing software via a hand-held data collection device. Meter readers collect the data by driving through the Village and data is transmitted from the meters to the meter collection device as the meter reader drives-by. Construction on the project began in March 2010 and was completed in March 2011.

Project Components and Associated Costs:

The total project cost was approximately $166,000. Itemized project components are as follows:

- One hundred sixty two 3/4-inch diameter residential meters ($77,000).
- Nine 1-inch diameter residential meters ($5,400).
- Thirteen 3/4-inch diameter non-residential meters ($17,000).
- One hand-held meter reader and billing software ($7,500).

Project Benefits

- The project contacts, Mike Schultes and Karla Costello, did not have access to water savings data at the times of their respective interviews. In addition, Mr. Schultes indicated that generating an estimate of water savings may not be possible since Village service connections were unmetered before the start of this project.
- According to the CWSRF benefit reporting information, the anticipated water savings from this project was 4,000 gallons per day.

Project Cost/Benefit Calculations

- Assuming a daily water savings of 4,000 GPD, this project will save approximately 161 gallons of water per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/15/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
7 - Kansas City	NE	Village of Pleasanton	C317744

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: ME

Total SRF Loan Amount: $329,536

ARRA Loan Amount: $329,536

GPR Category Loan Amount: WE - $329,536

Principle Forgiveness Amount: $96,719

Loan Payback Period:

General Project Description:

Project will provide new water meters in previously unmetered areas of the Village of Pleasanton (Village) water system improving water use efficiency and creating a user charge system based on rates of water use.

Primary Environmental Benefits:

The project will allow the Village to create a charging system based on actual water use and improve water use efficiency.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from internet research.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Miller & Associates Consulting Engineers	Chris Miller, Design Engineer	Phone: (308) 234-6456 E-mail: cmiller@miller-engineers.com

Notes: Interviewed on 3/13/2012 and received additional information via email

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Sign (Source: Miller & Associates Consulting Engineers, P.C.).

Project Narrative

The project involves the installation of 185 new water meters and meter reading software in the Village's previously unmetered water system. The Village of Pleasanton services a population of approximately 360 residents. The project was completed October 2010.

Project Components and Associated Costs:

- Mobilization ($7,500).
- Furnish and Install Four New ¾" Indoor Meter, complete in place ($2,060).
- Furnish and Install 166 New ¾" Meter in Meter Pit, complete in place ($191,730).
- Furnish and Install Two New 1" Indoor Meter, complete in place ($1,450).
- Furnish and Install Nine New 1" Meter in Meter Pit, complete in place ($13,185).
- Furnish and Install Two New 4" Meter in Pit, complete in place ($15,360).
- Furnish and Install 49 New ¾" Curb Stop and Box, complete in place ($16,660).
- Furnish and Install Three New 1" Curb Stop and Box, complete in place ($1,155).
- Abandon existing line ($325).
- Fire Hall 2" Indoor Meter Installation, complete in place ($4,460).
- Hand 1" Meter Pit Installation, complete in place ($1,425).
- Hand Residence ¾" Pit Installation, complete in place ($1,960).
- Golden Harves ¾" Indoor Meter Installation, complete in place ($780).
- Trotters ¾" Indoor Meter Installation, complete in place ($760).
- Abandon Curb Stop 810 Sycamore, complete in place ($385).
- New Service 105 Cemetery Street with 1" Service and ¾" Meter Pit Installation, complete in place ($3,290).
- Noller Electric Line Split, complete in place ($3,450).
- Splash Pad Meter Pit Installation, complete in place ($5,460).
- Furnish and Install Computer, RF System Interrogation Device, Software, Interface Computer and Billing Program, complete in place ($18,325).
- Furnish and Install Two 2" Diameter Inside Meter with Compound Meter Fittings (at School) ($6,620).

- Remove ¾" Meter from Processing Plant and Install 1" Kornehorn ($485).
- Furnish Extra Meters, Fittings, Meter Pits, etc. ($6,174.86).
- Total Construction Cost of $302,321.04.
- The new water meters were manufactured by Neptune Technology Group at 1600 Alabama Highway 229, Tallassee, AL 36078. The meter models were TRU/FLO® Compound Meter – commercial; hp Turbine Meters – commercial; and T-10 Meters – residential.

Project Benefits:

- According to Mr. Chris Miller, the new water metering system is estimated to have an average of 40 percent water saving and pumping cost saving over the previously unmetered water system.
- The project has provided an incentive for water users to conserve and properly maintain their systems.

Project Cost/Benefit Calculations

Due to the lack of detailed information, it is not possible to compute the cost/benefit calculation.

Prepared By: Jared Richardson (PG Environmental, LLC) on 2/27/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

GPR Technical Project Information Reports

EPA REGION 8

Montana

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
8 - Denver	MT	City of Townsend	C304207

Primary GPR Category:
EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: ER

Total SRF Loan Amount: $749,529

ARRA Loan Amount: $749,529

GPR Category Loan Amount: EE - $749,529

Principle Forgiveness Amount: $390,700

Loan Payback Period:

General Project Description:

The City of Townsend (City) has undertaken a project to rehabilitate sewer lines to reduce I/I. Specifically, the project involved CIP lining of sewer lines and replacement of a short section of sewer.

Primary Environmental Benefits:

Reducing I/I will reduce pump run times at the City's main pump station thereby reducing energy consumption.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ Yes ☒ No

CWSRF Benefits Reporting Information Obtained ☒ Yes ☐ No

SRF Business Case Information Obtained ☐ Yes ☒ No

Internet Search Performed ☒ Yes ☐ No

Sources: No useful information was obtained from internet research.

Other Information Obtained ☐ Yes ☒ No

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Robert Peccia & Associates	Brad Koenig, P.E. (Project Engineer)	Phone: (406) 447-5000 E-mail: brad@rpa-hln.com

Notes: Interviewed on 2/16/2012 and sent additional email request

Entity	Contact Name and Title	Contact Phone Number / Email
City of Townsend	Tim Rauser, Public Works Director	Phone: (406) 266-3911 E-mail: cot@mt.net

Notes: Interviewed on 2/16/2012 and sent additional email request

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

The project involves sewer line rehabilitation via CCTV investigation, cast-in-place lining, manhole replacements, and a short section of sewer line replacement for the City I/I which will provide energy savings through reduced utility costs for the City's WWTP and primary pump station. The project was completed in April 21, 2010.

Project Components and Associated Costs:

- CIP lining of 18,695 feet of 8-inch sewer pipe at a cost of $285,099 ($15.25/ft.).
- CIP lining of 915 feet of 10-inch sewer pipe at a cost of $164,700 ($18.00/ft.).
- CIP lining of 900 feet of 12-inch sewer pipe at a cost of $32,400 ($36.00/ft.).
- CIP lining of 900 feet of 15-inch sewer pipe at a cost of $45,000 ($50.00/ft.).
- Sewer line replacement of 611 feet of 8-inch sewer pipe at a cost of $60,700.
- Eleven manholes replaced at a cost of $92,000.
- Mobilization, demobilization, bonding, and submittals cost of $9,750.
- Traffic control cost of $3,500.

Project Benefits:

- According to the project contact, Mr. Rauser, it is estimated that the project has reduced utility costs by approximately 50 to 60 percent for the three pumps at the primary pump station through reduced pump run times. According to the project contact, a reduction in flow has been observed at the primary pump station from approximately 600,000 GPD to 270,000 GPD.

Prepared By: Jared Richardson (PG Environmental, LLC) on 2/16/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

GPR Technical Project Information Reports

EPA REGION 8

South Dakota

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
8 - Denver	SD	Sioux Falls	C461232-28

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: GP

Total SRF Loan Amount: $1,803,000

ARRA Loan Amount: $1,619,400

GPR Category Loan Amount: EE - $1,619,400

Principle Forgiveness Amount: $180,300

Loan Payback Period: 10 Years

General Project Description:

The City of Sioux Falls (City) has installed an 844 kW generator at their Water Reclamation Facility (Facility) which will be used to convert biogas produced in the Facility's digesters to electricity.

Primary Environmental Benefits:

This project will reduce the Facility's reliance on fossil-carbon derived electricity for powering its operations. This project will also reduce the carbon footprint of the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Sioux Falls Wastewater Treatment Plant Website. Retrieved 3/13/2012. <http://www.siouxfalls.org/public-works/reclamation/treatment-team.aspx>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
HDR, INC	Dan Graber, Project Manager	Phone: (605) 977-7767 E-mail: Dan.Graber@hdrinc.com

Notes: Interviewed on 4/2/2012

Entity	Contact Name and Title	Contact Phone Number / Email
HDR, INC	Mike Johnson, Engineer	Phone: (605) 977-7778 E-mail: michael.p.johnson@hdrinc.com

Notes: Interviewed on 4/2/2012

Sioux Falls Water Reclamation Facility (Source: City of Sioux Falls).

Project Narrative

The Facility treats an average flow of 15 MGD. The facility currently has two, 350 kW engine generators that were installed when the Facility was constructed in the early 1980's. The generators combust biogas produced by on-site anaerobic digesters. Electricity produced by the generators is used to power the Facility. Heat produced by the generator is used to heat the digesters and to provide heat for the digesters and HVAC system.

ARRA funding was provided to install a third engine generator and ancillary equipment. The new generator can be run on either biogas or natural gas. It has a power output of 844 kW. Previously, if one of the two existing engines had to be shut down for maintenance, some of the digester gas was wasted by use of a waste gas burner (flare). With the new engine in place, one of the three engines can be shut down for maintenance without a reduction in digester gas usage or electricity generation. With the increased redundancy the City will not have to waste gas during normal operation. In addition, the efficiency of the new engine is greater the older two engines. The older two engines have a calculated electrical efficiency of 29.0 percent. The new engine generator has a listed efficiency of 38.1 percent. This increased efficiency will allow the City to produce more electricity with the same amount of biogas. Construction on this project began in October 2010 and was completed in August 2011.

Project Components and Associated Costs:

According to the Facility contacts, Dan Graber and Mike Johnson, an itemized cost breakdown was not available. However, the total project cost $1,704,000.

- One 844 kW generator for conversion of methane to electricity.
- Major ancillary equipment installed with the generator include a radiator, exhaust heat exchanger, jacket water heat exchanger, silencer, exhaust fan, supply fan, hot water pump, jacket water pump and a new waste gas burner.

Project Benefits:

- In the two years prior to the construction of the project, the Facility produced an average of 10,000 kWh of electricity per day. During the first five months of operation on the new generator, energy production has ranged between 13,000 to 15,000 kWh per day. This can be extrapolated to an increase in power production of approximately 1,460,000 kWh per year. The cash value of this increase in production is approximately $87,600 per year.

Project Cost/Benefit Calculations:

- Assuming annual savings of approximately $87,600 per year from electricity production, the simple payback period of this loan is approximately 18 years.
- Based on initial operational data, the expected increased energy produced over a 20 year project life equates to 18 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 4/6/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
8 - Denver	SD	Sioux Falls	C461232-31

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: GP

Total SRF Loan Amount: $1,831,523

ARRA Loan Amount: $1,210,719

GPR Category Loan Amount: EE - $1,222,560

Principle Forgiveness Amount: $183,152

Loan Payback Period: 10 Years

General Project Description:

The City of Sioux Falls (City) owns and operates the Sioux Falls Regional Sanitary Landfill (Landfill). The City has undertaken a project to install 46 new methane recovery wells to add to their existing biogas recovery wellfield. Recovered methane from the landfill is transported via pipeline to a nearby ethanol production facility where it is utilized in the ethanol production process.

Primary Environmental Benefits:

This project reduces the emission of methane, a potent greenhouse gas, from the landfill and provides the City with a green source of energy production which is sold to the ethanol production facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Soiux Falls Public Works Webpage. Retrieved 4/6/2012. <http://www.siouxfalls.org/PublicWorks/reclamation/treatment_team.aspx>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Sioux Falls	Rod Harms, Project Manager	Phone: (605) 367-8629 E-mail: rharms@siouxfalls.org

Notes: Interviewed 4/5/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Sioux Falls Regional Sanitary Landfill (Source: http://www.denr.sd.gov/des/wm/landfillmaps/lfsf.aspx).

Project Narrative

The City owns and operates the Landfill which is the largest landfill in the state of South Dakota and is operated under regulation from the South Dakota Department of Environment and Natural Resources. The Landfill is permitted to accept 150,000 tons of material per year. The Landfill possesses an existing well field with 43 wells which are used to remove leachate from the Landfill subsurface and to capture methane. Absent biogas capture, the methane (a powerful greenhouse gas) will be passively emitted from the surface of the Landfill. Captured biogas is transported via pipeline and sold to a nearby ethanol production facility. The City's project involved the installation of 46 new wells which permitted the City to increase the quantity of leachate extracted from the subsurface for treatment, and increased the volume of methane captured and transmitted to the ethanol production facility. Construction on the project was completed in December 2009.

Project Components and Associated Costs:

The total project cost was $1,560,000.

- 46 new methane extraction wells. Each well contains a pneumatic pump for dewatering, a 6-inch diameter, perforated PVC pipe, and wellhead ($869,000).
- One air compressor ($30,000).
- Air compressor building HVAC and electrical components ($12,800).

Project Benefits:

- According to Mr. Harms, the project has increased biogas capture from approximately 473 million SCF per year to 815 million SCF per year. This resulted in a green house gas reduction of 61,000 metric tons of CO_2 equivalents per year.
- The equivalent cash value of the increased gas production was not available at the time of the interview. Assuming a gross heating value of landfill gas of 500 BTU per SCF and a gas price of $5 per million Btu, the cash value of the increase in gas production is estimated to be approximately $684,000 per year.
- Prior to the installation of the project, average rates of the collected leachate were approximately 2,200 gallons per day. The upgrade increased this collection to approximately 6,670 gallons per day. The dewatering has also allowed the gas extraction wells to operate more effectively by keeping the wells free of liquid.

Project Cost/Benefit Calculations:

- Assuming annual revenues of $684,000 per year for increased gas production, the simple payback period of this loan over a 20 year project life is approximately 2 years.
- Based on the first month of operation, the expected energy content produced over a 20 year project life is equivalent to 820 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 4/6/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

GPR Technical Project Information Reports

EPA REGION 8

Wyoming

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
8 - Denver	WY	Town of Jackson	093

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: SO

Total SRF Loan Amount: $563,601

ARRA Loan Amount: $563,601

GPR Category Loan Amount: EE - $563,601

Principle Forgiveness Amount: $563,601

Loan Payback Period:

General Project Description:

The Town of Jackson (Town) has undertaken a project to expand the existing 27.3 kW photovoltaic installation at the Town's wastewater treatment plant (Facility). The project will add 165 kW of capacity.

Primary Environmental Benefits:

100% of the power generated by this solar installation will be used to off-set power consumption at the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Retrieved 2/23/2012. http://www.creativeenergies.biz/blog/category/events/; http://www.energy.idaho.gov/stimulus/d/spsp_creative_energies.pdf; http://www.ci.jackson.wy.us/resources/files//Government/F.%20Meeting%20Agendas/Council%20Packets/2009/111609/Consent/pvproject.pdf

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Town of Jackson Public Works	Larry Pardee, Public Works Director	Phone: (307) 733-3079 E-mail: lpardee@ci.jackson.wy.us

Notes: Interviewed on 2/23/2012 and sent additional email request. Follow-up call on 3/13/2012 and information obtained via email.

165 kW solar panel array (Source: Town of Jackson – Public Works).

Project Narrative

The project involved the installation of a 165 kW solar photovoltaic panel array at the City's Facility. The installation will supplement a 27.3 kW solar photovoltaic panel array previously completed at the Facility in 2008. This solar panel array will be used to off-set the power consumption of the Facility. The completed solar array will be the largest solar installation in the state. The Town received ARRA funding in the amount of $563,601 for this project and supplemented this with Town's funds of $284,399 for a total project cost of $848,000. The project contact, Larry Pardee, commented that the project has also generated community enthusiasm for additional green projects.

Project Components and Associated Costs:

- A 165 kW solar panel array manufactured by Sharp in Memphis, TN, Model No. NU-U235F1 ($619,280).
- Bonding ($26,395).
- Engineering and drawings ($2,000).
- Conduit and excavation ($30,293).
- Installation of solar panels, inverters, and wiring ($144,101).
- Testing, cleanup, monitoring, and balancing ($21,532).

Project Benefits:

- 100% of the power generated by this solar installation will be used to off-set purchased power for the Facility.
- According to Mr. Larry Pardee, upgrades to the Facility completed last fall totaling approximately $2,000,000, along with this recent solar panel installation at the Facility, have significantly reduced the Facility's annual operating costs.
- The Town received a rebate totaling $485,000 from the local utility provider for the energy saving upgrades completed at the Facility.
- According to Mr. Larry Pardee, the Facility saved approximately $19,168 in energy costs from September 10, 2010 through March 13, 2012.

Project Cost/Benefit Calculations

- Based on a total energy cost savings of $845,000, the simple payback period for this loan exceeds a 20 year project life.

Prepared By: Jared Richardson (PG Environmental, LLC) on 2/23/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

GPR Technical Project Information Reports

EPA REGION 9

Arizona

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
9 - San Francisco	AZ	Town of Buckeye	023-2010

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

WE - Water Efficiency

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $12,000.000

ARRA Loan Amount: $6,372,285

GPR Category Loan Amount: EE - $637,228

WE - $5,735,056

Principle Forgiveness Amount: $0

Loan Payback Period: 20 Years

General Project Description:

The City of Buckeye (City) has undertaken a project to add treatment capacity for 1.5 MGD to the existing Central Buckeye Wastewater Treatment Plant (Facility).

Primary Environmental Benefits:

This project will reduce the quantity of partially treated septage to groundwaters and will reduce energy consumption by centralizing wastewater treatment operations.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: West Valley Views. Retrieved 3/27/2012. <www.westvalleyview.com/main.asp?SectionID=2&SubSectionID=1&ArticleID=39600>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Buckeye	David Nigh, Water Resources Director	Phone: (623) 349-6101 E-mail: dnigh@buckeyeaz.gov

Notes: Interviewed on 4/3/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

The City owns and operates the Facility, an advanced wastewater treatment plant which treats an average daily flow of 1.2 MGD and possesses a design capacity of 3.0 MGD. The remaining 1.8 MGD of capacity has been paid for and bonded by the parties responsible for a previous expansion. This prevents the Town from using capacity in the Facility, since this capacity must be available to the paid participants in the previous expansion. The Facility's limited capacity is hindering development, including industrial and commercial job centers. There are also approximately 40 homes on septic tanks in high-groundwater areas of the service area of the Facility that should be connected to the sewer system and treatment plant but cannot until additional capacity is provided.

The City has undertaken a project to add treatment capacity for 1.5 MGD of wastewater flow to the existing Facility. The existing treatment process includes biological nutrient removal and tertiary filtration to produce finished effluent, or reclaimed water that meets Class A+ water quality standards as defined by Arizona Department of Environmental Quality. Treated effluent which is not reused is discharged to the Gila River. This project provides additional treatment capacity allowing for additional customers to connect to the Facility. The project contact for the City, David Nigh, declined to participate in an interview for this project. According to the CWSRF Benefits Reporting Information, construction on the project began in January 2010 and the project completion date was November 2011.

Project Components and Associated Costs:

Itemized project components are as follows:

- One additional aeration blower.
- One new 16" influent pump (replacing the existing 12" pump).
- One additional multi-celled secondary treatment (anoxic/aeration) basin.
- One addition mixed liquor recycle pump station.
- One additional secondary clarifier.

Project Benefits

- No information on project benefits was available.

Project Cost/Benefit Calculations

- Absent benefits information, it is not possible to compute project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/11/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
9 - San Francisco	AZ	Lake Havasu City	005-2009A

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: RE

Total SRF Loan Amount: $5,147,488

ARRA Loan Amount: $2,000,000

GPR Category Loan Amount: WE - $1,750,000

Principle Forgiveness Amount: $2,000,000

Loan Payback Period: 30 Years

General Project Description:

Lake Havasu City (City) has undertaken a project to add sewer service customers that currently use individual sewage disposal systems.

Primary Environmental Benefits:

This project will reduce the quantity of partially treated septage which is discharged into groundwater sources and increase the reuse of treated effluent.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Construction Equipment Guide. Retrieved 5/11/2012. <http://www.constructionequipmentguide.com/Lake-Havasu-City-Connects-Sewage-Systems/6689/>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Lake Havasu	Greg Froslie, Assistant Public Works Director	Phone: (928) 453-6660 E-mail: froslieg@lhcaz.gov

Notes: Interviewed on 4/11/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Project Narrative

The City was informed by the Arizona Department of Environmental Quality (ADEQ) that nitrate levels in groundwater from certain areas surrounding the City have increased to levels greater than the MCL of 10 parts per million and have been deemed unsuitable for drinking water use. ADEQ further informed the City that septic contamination of drinking water supply has already forced the closure of two drinking water supply wells in an area just north of Lake Havasu City. Consequently, the City has elected to retire many of the City's residential individual sewage disposal systems including approximately 25,000 septic tanks and transition users to the centralized wastewater treatment system.

Currently the City has a population of approximately 55,000 residents. Construction of the City's Wastewater System Expansion Program (Program) began in 2002 and to date more than 12,000 septic systems have been decommissioned and the homes connected to the sewer system. This project involved closing septic systems and installing sewer mains in the Tarpon Area of the City. As part of a separate project, the construction of a new regional wastewater treatment plant with appropriate reuse components was completed in 2007 to provide sufficient treatment capacity to continue making connections to the system. The expansion of the wastewater collection system for Lake Havasu City involves a very detailed and sequential program that accounts for future sewer connections, septic tank decommissioning, infrastructure, wastewater treatment capacity, and effluent disposal. Construction on the ARRA funded portion of the Program started in June 2009 and was completed in July 2010.

Project Components and Associated Costs:

The total project cost was $4,505,000. Itemized project components are as follows:

- 35,396 feet of sewer main.
- 40,263 feet of sewer lateral.
- 91 manholes.
- 137,399 square yards of pavement.
- Retired 536 septic tanks from service.

Project Benefits

- According to the project contact, Greg Froslie, the City has monitored their septic systems prior to commencing the project and found that the average septic system discharged approximately 60 gallons per GPCD. Assuming an average of 2.3 residents per service connection, this represents 27 MG per year of partially treated effluent captured from 536 service connections. Information on the specific quantity of reused water attributable to this project was unavailable to the project contact at the time of the interview.
- This project reduces the quantity of water discharged to groundwaters and reduces the loading of nitrate released to local surface and groundwaters.

Project Cost/Benefit Calculations

- This project is expected to provide treatment of 309 gallons of water per dollar invested over a 20 year project life.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/11/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
9 - San Francisco	AZ	City of Mesa	082-2009

Primary GPR Category:
EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EC

Total SRF Loan Amount: $254,844

ARRA Loan Amount: $126,000

GPR Category Loan Amount: EE - $126,000

Principle Forgiveness Amount: $126,000

Loan Payback Period: 20 Years

General Project Description:

The City of Mesa (City) has undertaken a project to replace existing pump drives at their Northwest Water Reclamation Plant (Facility) with new VFDs.

Primary Environmental Benefits:

Installation of VFDs drives will make operating the Facility's pumps more energy efficient.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: City of Mesa City Council Report (6/1/2009). Retrieved 4/6/2012. <www.mesaaz.gov/government/councilmtg/6-1-09/7f.pdf>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Mesa	Michele Davila, Contract Compliance Officer	Phone: (480) 644-5463 E-mail: michele.davila@mesaaz.gov

Notes: Interviewed on 4/6/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Mesa Wastewater Treatment Plant (Source: http://www.mesaaz.gov/water/wastewater_treatment.aspx).

Project Narrative

The City owns and operates the Facility which has a design treatment capacity of 18 MGD. The Facility has a liquid treatment train that includes screening, grinding, sedimentation, organics removal, nutrient removal, filtration, clarification, and disinfection. The effluent from the Facility is discharged to two recharge sites and the Salt River, which also recharges the aquifer. Effluent will also be used for freeway irrigation, on the Riverview Golf Course, and at the Granite Reef Underground Storage Project (GRUSP) for recharge purposes.

The project involves the addition of three VFDs to three pumps which convey treated effluent along an 8 mile long pipeline from the Facility to the GRUSP. Construction on this project began in February 2010 and reached substantial completion in April 2010.

Project Components and Associated Costs:

The total project cost was approximately $239,000. Itemized costs for project components are as follows:

- Three VFDs, manufactured by Ethernet, were installed on three existing pumps ($65,100 per VFD).

Project Benefits

- According to the project contact, energy consumption data for the three VFD-equipped pumps was not available. The project contact stated that all VFDs purchased by the City are 95 percent efficient.

Project Cost/Benefit Calculations

- Absent energy benefits information, it is not possible to compute cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/15/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
9 - San Francisco	AZ	City of Peoria	041-2009

Primary GPR Category:
EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: SO

Total SRF Loan Amount: $4,021,623

ARRA Loan Amount: $3,217,298

GPR Category Loan Amount: EE - $364,922

Principle Forgiveness Amount: $0

Loan Payback Period: 20 Years

General Project Description:
The City of Peoria (City) installed a 60 kW solar power array at their Beardsley Water Reclamation Facility (Facility).

Primary Environmental Benefits:
This project will reduce power usage and minimize the carbon footprint of the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ Yes ☒ No

CWSRF Benefits Reporting Information Obtained ☒ Yes ☐ No

SRF Business Case Information Obtained ☐ Yes ☒ No

Internet Search Performed ☒ Yes ☐ No

Sources: Peoria Utilities Department Webpage. Retreived 3/20/2012. <http://www.peoriaaz.gov/newsecondary.aspx?id=1449>.

Other Information Obtained ☐ Yes ☒ No

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Peoria	Claudia Christo, Civil Engineer	Phone: (623) 773-5263 E-mail: claudia.christo@peoriaaz.gov

Notes: Interviewed on 3/14/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Beardsley Water Reclamation Facility Solar Array (Source: City of Peoria).

Project Narrative

The Facility was constructed in 1989 and underwent a major expansion in 1998 to increase its treatment capacity from 0.3 MGD to 4 MGD. Treated effluent is disposed via groundwater recharge basins located on-site. In 2006, a new Operations Building was completed on this site which contains a control room, labs, and maintenance shops.

This project involved the installation of a 60 kW photovoltaic array at the Operations Building. The building is currently powered by a separate electrical service, which runs the Facility's process equipment. Due to this separate power feed, the City is able to use solar power at the building without impacting or disturbing Facility operations. Construction on this project began in August 2009 and substantial completion was reached in September 2009. The City began operating the array in January 2010.

Project Components and Associated Costs:

The total project cost to install the solar array was $474,000. Itemized project components are as follows:

- Two hundred sixty six 60 kW fixed, ground mounted, Solon blue polycrystalline solar modules and array mounts ($352,000).
- Onsite transmission line ($10,000).

Project Benefits:

- During the City 2011 fiscal year, the solar array produced 107,740 kWh of energy. The City uses this power to reduce purchased power from their local utility. The project contact, Ms. Claudia Christo, was not able to provide an estimate of the cost value of the solar electricity production since the City pays a variable electricity rate as a function of system-wide demand. However, assuming a $0.07/kWh rate, the value of the electricity produced can be estimated at $7,500 per year. In addition, their local utility pays the City a credit of approximately $13,000 annually for using the solar system which raises the estimated annual value of the electricity produced to approximately $20,500 per year.
- The system reduces the Facility's use of non-renewable electricity and reduces the Facility's carbon footprint.

Project Cost/Benefit Calculations

- Assuming annual revenues of $20,500 per year for electricity production, the simple payback period for this loan over a 20 year project life is approximately 18 years.
- Based on the first year of production, the expected energy produced over a 20 year project life is 5.9 kWh per dollar of the loan and 4.5 kWh per dollar of the total project cost for the solar array.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 3/21/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
9 - San Francisco	AZ	Pima County	025-2009

Primary GPR Category:
EE - Energy Efficiency
Secondary GPR Category:
WE - Water Efficiency
Other GPR Category:

GPR Subcategory: WP, RE, EP

Total SRF Loan Amount: $10,002,383
ARRA Loan Amount: $2,000,000
GPR Category Loan Amount: EE - $1,400,000
WE - $600,000
Principle Forgiveness Amount: $2,000,000
Loan Payback Period: 15 Years

General Project Description:
Pima County (County) has undertaken a project to construct a pipeline which allows for the connection of different sewage treatment service areas within the County.

Primary Environmental Benefits:
This project will reduce energy consumption within the County for wastewater treatment and save water.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**
CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**
SRF Business Case Information Obtained ☐ **Yes** ☒ **No**
Internet Search Performed ☒ **Yes** ☐ **No**
Sources: Pima County Website. Retrieved 4/11/2012. <www.pima.gov>.

Other Information Obtained ☐ **Yes** ☒ **No**
Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Pima County	Jaime Rivera, Project Manager	Phone: (520) 443-6134 E-mail: jaime.rivera@wwm.pima.gov

Notes: Interviewed on 4/11/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Installation of the Plant Interconnect Pipeline (Source: Pima County).

Project Narrative

The County owns and operates a set of wastewater treatment plants with a combined treatment capacity of 92 MGD and which operate within a service area containing approximately 650,000 residents (260,000 service connections). The project involves the construction of a pipeline called the Plant Interconnect, a 5-mile long gravity sewer line ranging in diameter from 66 inches to 72 inches and capable of conveying 72 MGD peak wet weather flow from the Roger Road Wastewater Treatment Plant service area to the Ina Road Water Pollution Control Facility. The Plant Interconnect also includes two siphons. As part of a separate project, the Ina Road plant capacity is being expanded from 37.5 MGD to 50 MGD and the Roger Road plant is being decommissioned. The Plant Interconnect project allows for the transfer of sewage generated in the Roger Road plant service area to the Ina Road plant for treatment. Centralization of services into a single plant provides the County with economies of scale which reduce overall energy and water use. Construction on the project began in March 2009 and substantial completion was reached in December 2010. The pipeline was placed into service in April 2011.

Project Components and Associated Costs:

The total project cost was $33,755,000. An itemized project component list is as follows:

- Five miles of centrifugally case reinforced fiberglass pipe with diameters ranging between 60 inches and 72 inches ($18,300,000).
- Two siphon crossings composed of 42 inch pipe barrels ($329,000).
- Plant Interconnect SCADA ($310,000).

Project Benefits

- Ninety percent of the effluent will be reused as reclaimed water, with the remainder discharged to the Santa Cruz River. Reclaimed water will be utilized to recharge the County's aquifer and as an irrigation water at area parks and golf courses. In the 2014/2015 fiscal year, average daily flows are projected to total 29 MGD, generating 26.1 MGD for water reuse purposes.
- During the 2008/2009 fiscal year, the Roger Road plant consumed 5,154,000 kWh of electricity and 74,700 million Btu of natural gas, while the Ina Road plant consumed 12,754,000 kWh and 187,400 million Btu. Total consumption for the two plants was 17,908,000 kWh and 262,100 million Btu. The County forecasts that the upgraded Ina Road will consume 60,000,000 kWh and 15,000 million Btu—an increase in total electricity consumption of 42,000,000 kWh and decrease in total natural gas consumption of approximately 247,000 million Btu. The net cost savings due to changes in energy consumption is anticipated to be approximately $346,000 per year.

Project Cost/Benefit Calculations

- Assuming energy cost savings of $346,000 annually, the simple payback period on the loan is approximately 6 years.
- Assuming a heating value to electrical energy conversion ratio of 3,412 Btu/kWh, an increased consumption of 42,000,000 kWh per year and natural gas savings of 247,000 million Btu, this project is anticipated to increase energy consumption by 69 kWh equivalents per dollar invested over a 20 year project life.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/11/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 6/22/2012

GPR Technical Project Information Reports

EPA REGION 9

California

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
9 - San Francisco	CA	Eastern Municipal Water District	5311-110

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP, , , ,

Total SRF Loan Amount: $43,546,128

ARRA Loan Amount: $26,621,801

GPR Category Loan Amount: EE - $25,143,997

- $

Principle Forgiveness Amount: $0

Loan Payback Period: 20 Years

General Project Description:

The Eastern Municipal Water District (District) has undertaken a project to improve the Moreno Valley Regional Water Reclamation Facility (MVRWRF, Facility) to upgrade its anaerobic digester, boiler, and pumping systems.

Primary Environmental Benefits:

The project will increase the energy efficiency of the Facility and allow the District to generate a greater portion of their electricity on site.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Elan & Associates	Greg Kahlen, Project Manager	Phone: (909) 273-3445 E-mail: gregk@elanltd.net

Notes: Interviewed on 2/24/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Acid Phase Digester (Source: Eastern Municipal Wastewater District).

Project Narrative

The District is in the process of upgrading the Facility to rehabilitate its anaerobic digester. This project is intended to correct process deficiencies and increase the Facility capacity. The Acid Phase Anaerobic Digester Project is part of a long-range plan to provide a minimum of 15.8 MGD of overall reliable capacity and ultimately achieve 30 MGD Facility capacity at final build-out.

The Facility's treatment process consists of two parallel liquid treatment trains called Plant 1 and Plant 2 with common headworks, preliminary treatment, influent lift station, tertiary treatment and solids treatment/handling facilities. The Acid-Phase Anaerobic Digestion (APAD) project included the expansion of solids handling facilities by adding a four-cell acid-phase digester followed by one additional methane-phase digester. Separate improvements which are being made to the Facility include upgrading headwork and preliminary treatment, additional digester mixing and heating system, additional digester gas handling system, additional aeration blower system and integrating into the overall plant, and upgrading odor control system.

Construction on this project began in July 2009 and substantial completion is scheduled to be reached in July 2012. However, construction on the acid phase digester and methane phase digester is substantially complete and both have been put into service already. Anecdotally, operations staff has already seen improvement in digester gas quality, digester gas quantity, and lower biosolids production to be hauled-off.

Project Components and Associated Costs:

The total project cost is $7,205,000. An itemized list of project components is as follows:

Acid-phase digester:

- Four cell acid-phase digester with a total operating volume of 230,000 gallons ($1,032,000).
- Four 15 hp chopper centrifugal digester mixing pumps, manufactured by Vaughan Company ($97,000).
- Heat exchange system ($97,000).

- Two 2-stage progressive cavity with grinder sludge transfer sludge pumps , manufactured by Moyno ($42,000).
- One 28 SCF per minute gas flare, manufactured by Bekaert ($300,000).

Methane-phase Digester:

- One 830,000 gallon digester tank ($1,054,000).
- One 60 hp chopper centrifugal digester mixing pump, manufactured by Vaughan ($388,000).
- Heat exchange system ($697,000).
- One 500 gpm chopper centrifugal sludge heat recirculation pump, manufactured by Vaughan ($62,000).

Plant 2 Influent Pumping:

- One new 18-inch diameter vortex grit hopper, manufactured by Infilco-Degremont ($107,000).
- Two recessed impeller grit pumps with hydraulic capacities of 430 gpm and grit capacities of 150 cubic feet per day (cfd), manufactured by WEMCO ($83,000).
- One grit classifier ($65,000).

Secondary Treatment Units:

- Rehabilitation of two 6,000 SCF per minute centrifugal turbo blowers ($84,000).
- Rehabilitation of turbo blower and installation of one new 6,000 scfm turbo blower, manufactured by APG-Neuros ($595,000).
- One new 5.5 MGD vertical turbine secondary effluent pump, manufactured by Weir-Floway ($172,000).
- Two new 4 MGD vertical turbine tertiary effluent pumps, manufactured by Weir-Floway ($250,000).
- One new 2.9 MGD vertical turbine utility water pump, manufactured by Weir-Floway ($90,000).

Boiler Facility:

- One 1.59 million Btu per hour natural gas boiler, manufactured by Cleaner-Brooks ($129,000).
- Heat exchange system ($33,000).

Project Benefits

- It is anticipated that after the processes are fully implemented higher Btu content value of digester gas from an average of 550 to 650 will result in an increase in available energy (in terms of Btu) of greater than 20 percent. The available Btu produced by APAD will be used in a Fuel Cell Cogeneration Facility which is currently in operation at MVRWRF to produce electricity for use at MVRWRF, thus reducing the demand on the utility grid system.
- Approximately 20% less biosolids/sludge to be dewatered and transported away for disposal.
- Less carbon-fuel utilization and emissions as a result of reduced truck-loads to haul the sludge to disposal sites.
- Reduced polymer usage during sludge dewatering.

Project Cost/Benefit Calculations

- Absent quantitative benefits information, it is not possible to compute project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/11/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/23/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
9 - San Francisco	CA	Inland Empire Utilities Agency	5176-110

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: RE

Total SRF Loan Amount: $3,146,563

ARRA Loan Amount: $2,954,028

GPR Category Loan Amount: WE - $3,146,563

Principle Forgiveness Amount: $0

Loan Payback Period: 20 Years

General Project Description:

The Inland Empire Utilities Agency (Agency) has constructed a 2.5 mile recycled water pipeline in order to extend their recycled water distribution network.

Primary Environmental Benefits:

Recycled water is distributed to end-users who utilize recycled water in place of potable water for landscape irrigation.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from internet research.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Inland Empire Utilities Agency	Jason Gu, Grants Officer	Phone: (909) 993-1636 E-mail: jgu@ieua.org

Notes: Interviewed on 3/28/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

36-inch Recycled Water Pipeline (Source: Inland Empire Utilities Agency).

Project Narrative

The Agency provides wastewater treatment at the Agency's four regional treatment facilities. The Agency currently operates a regional recycled water distribution system consisting of recycled water distribution mains and pump stations. The Agency is a water management agency and is the wholesale supplier of both water and recycled water within the Agency's service area. Water supplies include raw imported water purchased from the Metropolitan Water District of Southern California, surface water from filtration plants, and recycled water generated at the Agency regional treatment plants. Potable water and recycled water is provided to the retail water purveyors for delivery to the end users. Major uses include agricultural irrigation, industrial cooling processes, landscape irrigation, groundwater recharge, and construction dust control.

This project involves the Agency's 1299 Pressure Zone East Pipeline (1299 E. RW Pipeline) and consists of a new 36-inch diameter recycled water pipeline that will convey recycled water from the northern end of the North Etiwanda Pipeline to the future 1299 Recycled Water Reservoir site, located at Cucamonga Valley Water District's 1C Reservoir site. The pipeline alignment will be located in public right-of-way in the cities of Rancho Cucamonga and Fontana and within San Bernardino County Flood Control District (SBCFCD)'s San Sevaine Basin. According to the Agency's representative, Jason Gu, construction on the project reached substantial completion in 2011.

Project Components and Associated Costs:

- The pipeline is approximately 12,700 feet in length and will serve to transport water from the 1158 Pressure Zone to the 1299 Pressure Zone ($3,665,000).

Project Benefits:

- The Agency distributes a total of 8,500 million gallons per year of recycled water per year and generates $5,000,000 in revenue from recycled water wholesale. Information regarding benefits specific to this project was not available at the time of this interview.
- Mr. Gu estimated that overall, the Agency saves 69,000,000 kWh per year of electricity (due to reduced pumping and treating demand of potable water sources) and prevents the emission of 27,500 metric tons of greenhouse gasses (CO_2-equivalents) per year from all reused water in their system. Information regarding benefits specific to this project was not available at the time of this interview.

Project Cost/Benefit Calculations:

- Insufficient information was available to compute project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/4/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/8/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
9 - San Francisco	CA	Inland Empire Utilities Authority	5176-120

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: RE

Total SRF Loan Amount: $5,215,952

ARRA Loan Amount: $4,588,848

GPR Category Loan Amount: WE - $5,215,952

Principle Forgiveness Amount: $0

Loan Payback Period: 20 Years

General Project Description:

The Inland Empire Utilities Authority (Authority) has undertaken a project to purchase and refurbish a 3.5 mile million gallon reservoir and construct a new pump station in their recycled water distribution network.

Primary Environmental Benefits:

Recycled water is distributed to end-users who utilize recycled water in place of potable water for landscape irrigation.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from internet research.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Inland Empire Utilities Authority	Jason Gu, Grants Officer	Phone: (909) 993-1636 E-mail: jgu@ieua.org

Notes: Interviewed on 3/28/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Pump Station (Source: Inland Empire Utility Authority).

Project Narrative

The Agency provides wastewater treatment at the Agency's four regional treatment facilities. The Agency currently operates a regional recycled water distribution system consisting of recycled water distribution mains and pump stations. The Agency is a water management agency and is the wholesale supplier of both water and recycled water within the Agency's service area. Water supplies include raw imported water purchased from the Metropolitan Water District of Southern California, surface water from filtration plants, and recycled water generated at the Agency regional treatment plants. Potable water and recycled water is provided to the retail water purveyors for delivery to the end users. The Agency delivers recycled water, for groundwater recharge purposes, to several flood control or storm water recharge basins within the Chino Basin.

This project consists of the purchase and modification of an existing 3.5 million gallon potable water reservoir (the 1299 E. Reservoir) and the construction of a new recycled water pump station. Modification activities will include minor piping and fitting improvements to the potable water reservoir to convert the reservoir for recycled water use. The new pump station will include the installation of approximately 1,200 total hp (anticipated to consist of approximately two 100 hp, one 200 hp and two 400 hp pumps) of pump capacity. The pump station will transmit recycled water to the Victoria and San Sevaine basins on an as-needed basis.

Project Components and Associated Costs:

The total project cost for the 1299 E. Reservoir and 1630 E. Pump Station is approximately $8,669,247.

- 3.5 million gallon reservoir
- Two 100 hp pumps.
- One 200 hp pump.
- Two 400 hp pumps.
- Pump Surge Tank.
- Pump Building.

Project Benefits

- The Agency distributes a total of 8,500 million gallons per year of recycled water per year and generates $5,000,000 in revenue from recycled water wholesale. Information regarding benefits specific to this project was not available at the time of this interview.
- Mr. Gu estimated that in total, the Agency saves 69,000,000 kWh per year of electricity (due to reduced pumping and treating demand of potable water sources) and prevents the emission of 27,500 metric tons of greenhouse gasses (CO_2-equivalents) per year from all reused water in their system. Information regarding benefits specific to this project was not available at the time of this interview.

Project Cost/Benefit Calculations

- Insufficient information was available to compute project cost/benefit calculations.

Prepared By: Jared Richardson (PG Environmental, LLC) on 10/1/2011

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
9 - San Francisco	CA	Inland Empire Utilities Agency	5176-130

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: RE

Total SRF Loan Amount: $ 5,262,484

ARRA Loan Amount: $ 4,362,549

GPR Category Loan Amount: WE - $ 4,362,549

Principle Forgiveness Amount: $0

Loan Payback Period: 20 Years

General Project Description:

The Inland Empire Utilities Agency (Agency) has constructed a 2.4 mile recycled water pipeline in order to extend their recycled water distribution network.

Primary Environmental Benefits:

Recycled water is distributed to end-users who utilize recycled water in place of potable water for landscape irrigation.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from internet research.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Inland Empire Utilities Agency	Jason Gu, Grants Officer	Phone: (909) 993-1636 E-mail: jgu@ieua.org

Notes: Interviewed on 3/28/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Pipeline turnout at San Sevaine Basin (Source: Inland Empire Utilities Agency).

Project Narrative

The Agency provides wastewater treatment at the Agency's four regional treatment facilities. The Agency currently operates a regional recycled water distribution system consisting of recycled water distribution mains and pump stations. The Agency is a water management agency and is the wholesale supplier of both water and recycled water within the Agency's service area. Water supplies include raw imported water purchased from the Metropolitan Water District of Southern California, surface water from filtration plants, and recycled water generated at the Agency regional treatment plants. Potable water and recycled water is provided to the retail water purveyors for delivery to the end users. The Agency delivers recycled water, for groundwater recharge purposes, to several flood control or stormwater recharge basins within the Chino Basin.

The primary use of recycled water from the 1630 E Pipeline will be groundwater recharge at the Victoria and San Sevaine Basins. The project consists of the construction of a 36-inch diameter recycled water pipeline that will convey recycled water from the 1299 Reservoir site, located in the City of Rancho Cucamonga, to Victoria Basin and to San Sevaine Basin Number 5 (both San Bernardino County Flood Control District detention basins), which is located in the City of Rancho Cucamonga. The pipeline is approximately 12,700 feet in length.

Project Components and Associated Costs:

The total project cost is approximately $8,377,000. Capital costs for itemized project components are as follows:

- 12,700 feet of 36-inch diameter pipeline ($5,360,000).

Project Benefits:

- The Agency distributes a total of 8,500 million gallons per year of recycled water per year and generates $5,000,000 in revenue from recycled water wholesale. Information regarding benefits specific to this project were not available at the time of this interview.
- Mr. Gu estimated that in total, the Agency saves 69,000,000 kWh per year of electricity (due to reduced pumping and treating demand of potable water sources) and prevents the emission of 27,500 metric tons of greenhouse gasses (CO_2-equivalents) per year from all reused water in their system. Information regarding benefits specific to this project was not available at the time of this interview.

Project Cost/Benefit Calculations:

- Insufficient information was available to compute project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/4/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/12

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
9 - San Francisco	CA	Inland Empire Utilities Agency	5176-140

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: RE

Total SRF Loan Amount: $1,436,175

ARRA Loan Amount: $1,408,566

GPR Category Loan Amount: WE - $1,436,175

Principle Forgiveness Amount: $0

Loan Payback Period: 20 Years

General Project Description:

The Inland Empire Utilities Agency (Agency) has constructed a 0.80 mile recycled water pipeline in order to extend their recycled water distribution network.

Primary Environmental Benefits:

Recycled water is distributed to end-users who utilize recycled water in place of potable water for landscape irrigation.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was obtained from internet research.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Inland Empire Utilities Agency	Jason Gu, Grants Officer	Phone: (909) 993-1636 E-mail: jgu@ieua.org

Notes: Interviewed on 3/28/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Backfill of Church Street Lateral Pipeline Trench (Source: Inland Empire Utilities Agency).

Project Narrative

The Agency provides wastewater treatment at the Agency's four regional treatment facilities. The Agency currently operates a regional recycled water distribution system consisting of recycled water distribution mains and pump stations. The Agency is a water management agency and is the wholesale supplier of both water and recycled water within the Agency's service area. Water supplies include raw imported water purchased from the Metropolitan Water District of Southern California, surface water from filtration plants, and recycled water generated at the Agency regional treatment plants. Potable water and recycled water is provided to the retail water purveyors for delivery to the end users. The Agency delivers recycled water, for groundwater recharge purposes, to several flood control or storm water recharge basins within the Chino Basin.

This project consists of the construction of approximately 4,200 linear feet of 30-inch and 12-inch diameter recycled water pipeline that will convey recycled water westerly from the 1630 Segment A Pipeline, located at the intersection of Baseline Road and East Avenue, to the intersection of Etiwanda Avenue and Church Street, in the City of Rancho Cucamonga. The Church Street lateral will serve customers in the City of Rancho Cucamonga area. These customers will be served from the 1630 Pressure Zone, with the installation of a pressure reducing valve on the pipeline. At this time, the primary customers for the project will be Victoria Gardens, a shopping center, and Epicenter Stadium, with an estimated recycled water demand of 0.179 MGD to 0.357 MGD.

Project Components and Associated Costs:

The total project cost is approximately $2,500,000.

- 4,200 feet of 30-inch and 12-inch diameter recycled water pipeline.

Project Benefits:

- The Agency distributes a total of 8,500 million gallons per year of recycled water per year and generates $5,000,000 in revenue from recycled water wholesale. Information regarding benefits specific to this project was not available at the time of this interview.
- Mr. Gu estimated that in total, the Agency saves 69,000,000 kWh per year of electricity (due to reduced pumping and treating demand of potable water sources) and prevents the emission of 27,500 metric tons of greenhouse gasses (CO_2-equivalents) per year from all reused water in their system. Information regarding benefits specific to this project was not available at the time of the interview.

Project Cost/Benefit Calculations:

- Insufficient information was available to compute project cost/benefit calculations.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/4/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/8/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
9 - San Francisco	CA	Inland Empire Utilities Authority	5327-110

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP, , , ,

Total SRF Loan Amount: $27,434,811

ARRA Loan Amount: $14,823,874

GPR Category Loan Amount: EE - $14,823,874

- $

Principle Forgiveness Amount: $0

Loan Payback Period: 20 Years

General Project Description:

The Inland Empire Utilities Authority has undertaken a project to replace the machinery for sludge dewatering at their Regional Water Recycling Plant No. 1 (Facility).

Primary Environmental Benefits:

This project reduces the quantity of trucking and shipping required to dispose of the dewatered biosolids which reduces the energy consumption and carbon footprint of the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Inland Empire Utilities Agency Website. Retrieved 4/2/2012. <http://www.ieua.org/facilities/rp1.html>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Inland Empire Utilities Authority	Jason Gu, Grants Officer	Phone: (909) 993-1636 E-mail: jgu@ieua.org

Notes: Interviewed on 3/28/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

RP-1 Dewatering Facility Silo (Source: Inland Empire Utilities Authority).

Project Narrative

The Facility is located in the City of Ontario near the intersection of State Highway 60 and Archibald Avenue. The Facility has undergone several expansions to increase the design wastewater treatment capacity to the current 44 MGD and biosolids treatment capacity equivalent to a wastewater flow rate of 60 MGD. The current solids treatment train utilizes gravity and dissolved air flotation thickeners, three-phase anaerobic digestion, dewatering, and biosolids compression. Biosolids removed from the compressors are shipped to a disposal facility where it is processed into compost. The Facility serves the Cities of Ontario, Rancho Cucamonga, Upland, Montclair, Fontana and an unincorporated area of San Bernardino County.

This project will expand the dewatering facilities at the Facility by replacing the existing filter belt presses with a more efficient and cost effective dewatering system using centrifuges. A storage system for the dewatered cake will also be added to provide a minimum of 48 hours of dewater cake storage. This will allow more flexibility in scheduling of trucks to haul the solids to the composting facility. The project will also replace the belt conveyance system with a dual system to insure reliability and redundancy. This will eliminate potential bottlenecks at this system when handling current and ultimate treatment capacities. This project will only utilize the existing footprint of the building to house the new system upgrade. Construction on this project was completed in late 2011 and testing of Facility processes was completed in January 2012.

Project Components and Associated Costs:

The total project cost is approximately $18,200,000. Itemized project components are as follows:

- Four 360 gpm Alfa Laval (Model G2-120) centrifuges with VFDs.
- Four VFDs on sludge feed pumps.
- Three VFDs on centrate pumps.
- Four VFDs on polymer blending units.
- Sixty Solarworld SW245 Mono 219.6 watt photovoltaic panels, total system size of 12.65 kilowatts.

Project Benefits

- According to the project contact, Jason Gu, the use of centrifuges for dewatering has reduced energy use at the Facility by approximately 800,000 kWh per year relative to using belt-filter. This savings has been realized due to reductions in the quantity of hauling required to dispose of sludge. The centrifuges are capable of producing 24 percent cake solids, whereas belt filter presses produce 18 percent cake solids. The use of centrifuges also reduces CO_2 emissions by 330 metric tons per year. The cash value of this energy savings was not available at the time of the interview.
- Estimates of the energy savings associated with the use of VFD drives and energy production associated with the photovoltaic arrays had not been made at the time of the interview.

Project Cost/Benefit Calculations

- Based on the energy savings associated with the use of centrifuges for dewatering alone, the energy saved by the project over a 20 year project life is approximately 1.1 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/10/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 6/22/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
9 - San Francisco	CA	Literacy for Environmental Justice	6500-110

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

EE - Energy Efficiency

Other GPR Category:

GI - Green Infrastructure

GPR Subcategory: RE

Total SRF Loan Amount: $350,160

ARRA Loan Amount: $350,160

GPR Category Loan Amount: WE - $116,720

EE - $116,720

Principle Forgiveness Amount: $350,160

Loan Payback Period: 20 Years

General Project Description:

The Literacy for Environmental Justice Facility (Facility) is environmental center which provides educational services to communities in the San Francisco Bay area. The project involves the following improvements at the Facility: a new green roof, rainwater harvesting tanks, and an on-site wastewater treatment system.

Primary Environmental Benefits:

The project will reduce electricity consumption at the Facility, reduce potable water consumption, and provide an educational resource on environmental issues for surrounding communities.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was identified in the internet research.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Literacy for Environmental Justice	Patrik Rump, Acting Director	Phone: (415) 282-6840 E-mail: patrik.rump@lejyouth.org

Notes: Interviewed on 2/7/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Facility Rainwater Catchment Tanks (Source: Literacy for Environmental Justice).

Project Narrative

The Facility is an educational center for green building and sustainability education for the San Francisco Bay Area, providing demonstrations of low impact development BMP's, with an emphasis on environmental justice to reflect its location in one of the most historically polluted communities in the region, Bayview-Hunterspoint. The Facility's objective is to educate visitors about the critical importance of green building, water and energy efficiency, and sustainability by modeling innovative low impact design solutions.

The Facility treats its own wastewater using constructed wetlands and UV disinfection lamps. In addition, it features a green roof and native landscaping, which conserve water and prevent stormwater runoff. ARRA/GPR money funded the construction of the green roof, rainwater catchments, native landscaping, and a constructed wetland wastewater treatment system.

Project Components and Associated Costs:

The total project cost was approximately $350,000. Itemized capital cost for specific project components are as follows:

- 1,200 sf green roof ($24,000).
- Rainwater harvesting catchments including three 34,800 gallon tanks and irrigation pumps ($25,000).
- Native landscaping on 2,000 sf drain field ($24,000).
- On-site constructed wetland wastewater treatment system. Includes wetland, two ORENCO septic tanks, and feed pumps ($45,000).

Project Benefits:

- Harvests rainwater and recycles all wastewater on-site.
- According to the project contact, Patrik Rump, data on or estimates of energy savings for the project are not possible to collect for the project.

Project Cost/Benefit Calculations:

- Since energy savings data was unavailable, it is not possible to compute cost/benefit calculations for the energy efficiency portion of the project.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 4/25/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/8/2012

GPR Technical Project Information Reports

EPA REGION 9

Hawaii

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
9 - San Francisco	HI	County of Kauai	C15004704

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

WE - Water Efficiency

Other GPR Category:

GPR Subcategory: SO, RE

Total SRF Loan Amount: $15,679,383

ARRA Loan Amount: $7,438,075

GPR Category Loan Amount: EE - $1,200,000

WE - $6,238,075

Principle Forgiveness Amount: $7,438,075

Loan Payback Period: 20 Years

General Project Description:

The County of Kauai (County) is undertaking a project to expand the capacity of the Waimea Wastewater Treatment Plant (Facility). This project will improve the quality of the recycled water produced by the Facility and incorporate a photovoltaic array.

Primary Environmental Benefits:

This project will permit the County to reuse more of its effluent and will reduce the fossil-carbon derived electricity consumption of the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: Garden Island News. Retrieved 5/8/2012. <http://thegardenisland.com/news/local/article_1253b842-4542-11df-8f46-001cc4c002e0.html>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
County of Kauai	Ed Tschupp, Wastewater Division Chief	Phone: (808) 241-4084 E-mail: etschupp@kauai.gov

Notes: Interviewed on 3/7/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Waimea Wastewater Treatment Plant Tertiary Treatment Units (Source: County of Kauai).

Project Narrative

The County owns and operates the Facility which is capable of treating 0.3 MGD of wastewater. Since this flow is approximately the design capacity of the Facility, the County has prohibited new service connections from being added to the system since the 1990's in order to prevent the system from being overwhelmed. This project involves increasing the capacity of the Facility from 0.3 MGD to 0.7 MGD. Additionally, the Facility is being designed so that the capacity can be increased by an additional 0.5 MGD in subsequent construction phases. These capacity increases will permit the County to allow new housing and business development within the community. The current treatment train is capable of producing tertiary treated recycled water, which is rated for limited use (primarily irrigation at golf courses). This project will improve the quality of the effluent such that the County may expand the types of end-uses for which it may sell its effluent. The project also incorporates solar power generation, which is anticipated to provide approximately 60 percent of the Facility's power demand. Construction on this project is scheduled to reach substantial completion in August 2012.

Project Components and Associated Costs:

The total project cost is approximately $15,300,000. Capital costs for itemized project components are as follows:

- Headworks expansion ($1,226,000).
- Membrane bioreactor ($2,192,000).
- Dissolved air flotation, filtration, and ultraviolet disinfection ($2,607,000).
- 125 kW photovoltaic array ($800,000).

Project Benefits:

- Currently, the County is able to distribute 77.5 MG per year of Facility effluent for limited uses and receives no revenue for the effluent. After the project upgrade, the County will be able to produce salable effluent which, according to the project contact, Ed Tschupp, will be capable of generating anywhere from $15,500 (77.5 MG sold per year) to $50,000 (172.5 MG sold per year) at $0.20 per 1,000 gallons.
- According to Ed Tschupp, the solar system is anticipated to produce approximately 401,500 kWh per year of electricity. Currently, the County's electricity provider charges $0.38 per kWh, which indicates that the cash value of the solar-produced electricity is approximately $153,000 per year.

Project Cost/Benefit Calculations:

- Assuming revenues and cost savings from the project of $203,000 per year, the simple payback period for this loan exceeds a 20 year project life. The simple payback period on the solar power portion of the project, only, is approximately 8 years.
- Over a 20 year project life, the solar portion of the project will generate 6.7 kWh per dollar invested (energy efficiency portion of the loan). The water reuse portion of the project will generate 305 gallons of water savings per dollar invested (water efficiency portion of the loan).

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 5/8/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/9/2012

GPR Technical Project Information Reports

EPA REGION 10

Alaska

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
10 - Seattle	AK	City of Palmer	671161

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $2,500,000

ARRA Loan Amount: $2,500,000

GPR Category Loan Amount: EE - $2,500,000

Principle Forgiveness Amount: $2,500,000

Loan Payback Period: 1 Years

General Project Description:

The purpose of this project is to upgrade the City of Palmer's (City) Wastewater Treatment Plant (Facility) in order to improve ammonia treatment capacity. Upgrades to the Facility include enclosing two aerated lagoons, installing additional baffles, modifying the headworks, and installing new process controls. Increased energy efficiency is achieved by reducing algae growth and improving nitrification performance. These changes will result in lower electricity requirements and reduce sludge production.

Primary Environmental Benefits:

The primary environmental benefit of the project is a reduction in energy consumption at the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: City of Palmer Wastewater Treatment Plant Project Webpage. Retreived 1/11/2012. <http://www.cityofpalmer.org/index.asp?Type=B_BASIC&SEC={8C2642C8-B5F1-49C0-8C85-183338BC8BC2}>

Other Information Obtained ☒ **Yes** ☐ **No**

Sources: City of Palmer NPDES Permit No. AK0022497

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Palmer	Tom Cohenour, Public Works Director	Phone: (907) 761-1358 E-mail:

Notes: Interviewed on 1/23/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

City of Palmer Wastewater Treatment Plant Lagoon (Source: City of Palmer).

Project Narrative

The Facility provides treatment of wastewater for a population of approximately 3,500 residents. Treated effluent is discharged to the Matanuska River. The existing treatment train consists of headworks, three mechanically aerated treatment lagoons, and an ultraviolet disinfection system. Sludge is periodically dredged from the lagoon, amended with lime, and utilized as a topsoil amendment.

The purpose of this project is to improve energy efficiency and ammonia treatment capacity. Upgrades to the Facility include installing HDPE surface covers/insulation on two of the three aerated lagoons, installation of additional baffles in each of the three lagoons, replacing the four existing blowers with three high-efficiency blowers, installing a new blower manifold, and installing new a SCADA process control system. Increased energy efficiency is achieved by reducing algae growth in the lagoons and improving nitrification performance. These changes will result in lower electricity requirements, less sludge production, and enable the City to meet ammonia effluent limitations contained in its NPDES permit. Project construction began in October 2011 and is projected to be completed in March 2012.

Project Components and Associated Costs:

- Two HDPE Modular Covers, purchased from Lemna Technologies, Inc. The covers are 8 inches thick and possess insulation with an R-value of 14. The combined areas of the covers are 119,658 sf.
- Eight new baffles, which are composed of a plastic media suspended on PVC frames, with dimensions of 20 ft in length and 5 ft tall.
- SCADA system used to automate and control unit process operations at the Facility.
- Two high-efficiency, 60 hp blowers.

Project Benefits:

- Enclosing the treatment lagoons will prevent the growth of algae, which will result in less sludge production and decrease the quantity of BOD requiring treatment. Reduced BOD will permit the Facility to operate their blowers at a lower rate and reduce Facility demand for electricity.
- Insulating the lagoons with surface covers will help the system retain heat, which will improve treatment performance and prevent the lagoons from freezing. Prior to installing the lagoon covers, the blowers were operated at a high rate in order to prevent the lagoons from freezing.
- Installation of baffles will provide additional surface area to accommodate the growth of nitrifying organisms and improve the Facility's ammonia removal efficiency. Ammonia removal requires oxygen so a more efficient nitrification process will permit the Facility to operate their blowers at a lower rate and reduce Facility demand for electricity.
- According to documentation provided by Mr. Cohenour, the City estimates that the project will result in a reduction in energy use of 44.5 percent.

Project Cost/Benefit Calculations:

- According to documentation provided by Mr. Cohenour, the City spends an average of $138,100 per year on electricity at the Facility. Assuming that a 44.5 percent reduction in energy use is realized, energy costs will be reduced by $62,145 per year. Based solely on electricity cost savings, the project payback period will likely exceed a 20 year project design life.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 1/23/2012

Reviewed By: (PG Environmental, LLC) on 7/25/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
10 - Seattle	AK	City of Wasilla	ACWF#905091

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $300,000

ARRA Loan Amount: $300,000

GPR Category Loan Amount: EE - $300,000

Principle Forgiveness Amount: $300,000

Loan Payback Period: 1 Year

General Project Description:

This project will provide for the purchase of a new energy efficient replacement vactor truck needed to maintain the City of Wasilla (City) separate storm sewer system which affects the water quality of Wasilla Lake, Cottonwood Creek and Lake Lucille.

Primary Environmental Benefits:

The new equipment will use less energy and fossil fuel that the existing arrangement.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was identified during the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City Wasilla Public Works	Archie Giddings, Director of Public Works	Phone: (907) 373-9018 E-mail: agiddings@ci.wasilla.ak.us

Notes: Interviewed on 2/27/2012 and sent additional email request.

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Vactor 2100 Plus Combination Sewer Cleaner (Source: City of Wasilla).

Project Narrative

This project provided the City with funding for the purchase of a new energy efficient vactor truck needed to maintain the City's separate storm sewer system which affects the water quality of Wasilla Lake, Cottonwood Creek and Lake Lucille. The City purchased a Vactor 2100 Plus Combination Sewer Cleaner, to replace the outdated 1978 vintage machine, and began utilizing the equipment in January 2010.

Project Components and Associated Costs:

- Vactor truck ($305,000).

Project Benefits

- The vactor truck will allow the City to terminate a contract for vactor services which cost $50,000 annually.
- According to Mr. Giddings and a brochure from the product manufacturer, the new vactor truck has improved fuel economy and achieved a 10 percent reduction in water consumption.
- Reduced equipment maintenance.
- The City is able to complete entire storm drain system cleaning annually vs. bi-annually (i.e., increased frequency). For example in 2010, the City completed cleanings of 83 catch basins, 32 storm drain manholes, and 4 oil/grit separators.

Project Cost/Benefit Calculations

- The simple payback period for the project is approximately 6 years, based on the cost of contracting the work at $50,000 annually.

Prepared By: Jared Richardson (PG Environmental, LLC) on 2/27/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/8/2012

GPR Technical Project Information Reports

EPA REGION 10

Oregon

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
10 - Seattle	OR	Central Oregon Irrigation District	R06216

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: WP

Total SRF Loan Amount: $4,000,000

ARRA Loan Amount: $4,000,000

GPR Category Loan Amount: WE - $4,000,000

Principle Forgiveness Amount: $2,000,000

Loan Payback Period: 20 Years

General Project Description:

The Central Oregon Irrigation District (District) has undertaken a project to replace 2.25 miles of an existing irrigation water distribution open canal with a new gravity flow pipeline. Installation of the pipeline will make it possible for the District to construct a new hydroelectric facility at the end of the pipeline under a separately funded project.

Primary Environmental Benefits:

This project reduced water losses from the irrigation system due to seepage and evapotranspiration, allowed the District to add a new renewable energy resource to their energy generation portfolio, and permitted the District to permanently restore 20 cfs of flow to the Deschutes River.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was identified during the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Central Oregon Irrigation District	Steve Johnson, Manager	Phone: (541) 548-6047 E-mail: stevej@coid.org

Notes: Interviewed on 2/8/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Installation of Irrigation Water Distribution Pipeline (Source: Central Oregon Irrigation District).

Project Narrative

The District operates an irrigation water distribution system which diverts water from the Deschutes River for distribution to industrial and agricultural users in central Oregon. Much of the District's distribution system is composed of unlined, earthen canals which were hand dug approximately 100 years ago. According to the project contact, Steve Johnson, these canals are capable of water losses of up to 40 percent of flow due to seepage and evapotranspiration.

The purpose of this project was to replace 2.25 miles of existing canal with a steel, gravity-flow pipeline which will substantially reduce water losses in the distribution system. In addition, rather than utilizing the water saved through this project, the District will permanently decrease the quantity of flow diverted during the irrigation season (May to September) from the Deschutes River by a magnitude equal to their water savings—approximately 20 cfs, or approximately 15 percent of the Deschutes River's total flow. Finally, converting the open channel canals to an enclosed pipeline made it feasible for the District to construct a 5-megawatt hydropower facility at the terminus of pipeline under a separately funded project. Construction on the pipeline began in October 2009 and was completed in April 2010.

Project Components and Associated Costs:

- 2.25 miles of 9-feet diameter steel pipe. Specific cost information was not available to Mr. Johnson at the time of the interview.

Project Benefits:

- Reduced water losses in the irrigation system by 20 cfs (i.e., approximately 13 million gallons per day).
- Restored approximately 20 cfs of flow to the Deschutes River. The Deschutes River is currently listed on the State of Oregon's 303(d) list as being impaired for temperature. The addition of 20 cfs of flow to the river will assist in stabilizing temperature levels in the waterbody. This will provide a secondary benefit of enhancing and protecting the beneficial uses of the Deschutes River with respect to fish and wildlife habitability.
- Installation of the pipeline made it feasible to construct a 5-megawatt hydropower facility at the terminus of the pipeline under a separately funded project.

Project Cost/Benefit Calculations

- Mr. Johnson verified that the District has decreased their water diversions from the Deschutes River by 20 cfs since construction was completed on the new pipeline.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 2/10/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/8/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
10 - Seattle	OR	Farmers Irrigation District	R06322

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: WR, WP, OR

Total SRF Loan Amount: $4,000,000

ARRA Loan Amount: $4,000,000

GPR Category Loan Amount: WE - $4,000,000

Principle Forgiveness Amount: $3,000,000

Loan Payback Period: 20 Years

General Project Description:

The Farmers Irrigation District (District) replaced 6.2 miles of existing irrigation water distribution canals with a new pressurized distribution pipeline. Installation of the pipeline made it possible for the District to increase power production at a hydroelectric plant which is fed by the distribution system.

Primary Environmental Benefits:

This project reduced water losses from the irrigation system due to seepage and evapotranspiration and allowed the District to increase their hydropower production capacity.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was identified during the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Farmers Irrigation District	Jerry Bryan, Project Manager	Phone: (541) 806-0377 E-mail: wjbryan@gorge.net

Notes: Interviewed on 2/9/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Installation of Irrigation Water Distribution Pipeline (Source: Farmers Irrigation District).

Project Narrative

The District operates an irrigation water distribution system which diverts water from the Hood River for distribution to industrial and agricultural users in the Hood River Valley. Much of the District's distribution system is composed of unlined, earthen canals. According to the District's Project Manager, Jerry Bryan, these canals are capable of substantial in-stream water losses due to seepage and evapotranspiration. Additionally, it is difficult to meter end-user withdrawals from the canal system and it is not uncommon for irrigation water end-users to overdraw their water allotment from the system. Many of these end-users must use pumps to withdraw water from the distribution system.

The purpose of this project was the replacement of 6.2 miles of existing canal with HDPE, pressurized pipeline which substantially reduced water losses in the distribution system. In addition, the irrigation water distribution system is integrated into one of the District's three hydroelectric power plants. By converting the open channel canals to an enclosed pipeline, the District is able to use the conserved water to increase flow through their power plant and produce additional renewable energy.

Installing the pipeline also permitted the District to install flow meters to measure withdrawals from the system by irrigation water end-users. The District also installed three high-efficiency pumps in the system and removed a large number of smaller, less efficient pumps throughout the system. Construction on the pipeline was completed in mid-2010.

Project Components and Associated Costs:

Specific cost information for these project components was not available to Mr. Bryan at the time of the interview.

- Installed 6.2 miles of HDPE pipe. Pipe sizes varied from 4-inches to 24-inches.
- Three 125 hp pumps with VFDs units and removed 1,450 individual pumps.
- Flow meters for irrigation water end-users.

Project Benefits

According to Mr. Bryan, the project has demonstrated the following benefits since construction was completed in 2010:

- Reduced instream water losses due to seepage, evaporation, and end-user overdraw by approximately 392 MG per year.
- Reduced electricity consumption by installing three, premium efficiency 125 hp pumps and removing 1,450 smaller, less efficient pumps. According to Mr. Bryan, electricity consumption was reduced by 1.45 million kWh/yr.
- Increased electricity production at the hydropower plant by 28 million kWh/yr.

Project Cost/Benefit Calculations

- Assuming an electricity cost of $0.11 per kWh, the project will generate approximately $160,000 per year due to reductions in electricity consumption and $3,080,000 per year due to increased power production, for a total annual value of $3,240,000 per year. Under these conditions, the project payback period will be less than two years.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 2/10/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/8/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
10 - Seattle	OR	Swalley Irrigation District	R06896

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: WP

Total SRF Loan Amount: $3,100,000

ARRA Loan Amount: $3,100,000

GPR Category Loan Amount: WE - $3,100,000

Principle Forgiveness Amount: $2,325,000

Loan Payback Period: 20 Years

General Project Description:

The Swalley Irrigation District (District) has replaced 1.3 miles of an existing irrigation water distribution canal with a new gravity flow pipeline. Installation of the pipeline made it possible for the District to construct a new hydroelectric facility at the end of the pipeline under a separately funded project.

Primary Environmental Benefits:

This project reduced water losses from the irrigation system due to seepage and evapotranspiration, allowed the District to add a new renewable energy resource to their energy generation portfolio, and permitted the District to permanently restore 29 cfs of flow to the Deschutes River.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was identified during the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Swalley Irrigation District	Suzanne Butterfield, Manager	Phone: (541) 388-0658 E-mail: suzanne@swalley.com

Notes: Interviewed on 2/8/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Irrigation Water Pipeline Installation (Source: Swalley Irrigation District).

Project Narrative

The District operates an irrigation water distribution system which diverts water from the Deschutes River for distribution to 667 agricultural users in central Oregon where it is utilized to irrigate 4,306 acres of land. Much of the District's distribution system is composed of unlined, earthen canals which were hand dug approximately 100 years ago. According to the project contact, Suzanne Butterfield, these canals are capable of experiencing substantial water losses due to seepage and evapotranspiration.

The purpose of this project was the replacement of 1.3 miles of existing canal with a HDPE pipeline which will substantially reduce water losses in the distribution system. This canal replacement project was a component of a larger, separately funded project to replace an additional 3.8 miles of canal—resulting in a total replaced canal length of 5.1 miles. The cost to install 1.3 miles of pipeline was $3,100,000 and the cost to install all 5.1 miles was $14,500,000. In addition, rather than utilizing the water saved through this project, the District will permanently decrease the quantity of flow diverted during the irrigation season (May to September) from the Deschutes River by a magnitude equal to their water savings—approximately 29 cfs or approximately 20 percent of the Deschutes River's total flow. Finally, converting the open channel canals to an enclosed pipeline made it feasible for the District to construct a hydropower facility at the terminus of pipeline under a separately funded project. Construction on the pipeline began in the fall 2009 and was completed in April 2010.

Project Components and Associated Costs:

- 1.3 miles of 48-inch and 54-inch diameter HDPE pipeline and metal gratings to screen out solids in the irrigation water ($3,100,000).

Project Benefits:

- Reduced water losses in the irrigation system by 29 cfs (i.e., approximately 19 MGD).
- Restored approximately 29 cfs of flow to the Deschutes River. The Deschutes River is currently listed on the State of Oregon's 303(d) list as being impaired for temperature. The addition of 29 cfs of flow to the river will assist in stabilizing temperature levels in the receiving water. This will provide a secondary benefit of enhancing and protecting the beneficial uses of the Deschutes River with respect to fish and wildlife habitability.
- Installation of the pipeline made it feasible to construct a hydropower facility at the terminus of the pipeline.

Project Cost/Benefit Calculations

- Ms. Butterfield verified that the District has decreased their water diversions from the Deschutes River by 29 cfs since construction was completed on the new pipeline. Over a 20 year project life, this project will save 45,000 gallons of water per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 2/16/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/8/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
10 - Seattle	OR	Three Sisters Irrigation District	R06914

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: WP

Total SRF Loan Amount: $465,340

ARRA Loan Amount: $465,340

GPR Category Loan Amount: WE - $465,340

Principle Forgiveness Amount: $349,005

Loan Payback Period: 20 Years

General Project Description:

The Three Sisters Irrigation District (District) has replaced 3.2 miles of an existing irrigation water distribution canal with a new gravity flow pipeline. Installation of the pipeline made it possible for the District to remove 38 pumps from service.

Primary Environmental Benefits:

This project reduced water losses from the irrigation system due to seepage and evapotranspiration, allowed the District to reduce energy used for pumping, and permitted the District to permanently restore 3.6 cfs of flow to the Whychus Creek.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: No useful information was identified during the internet search.

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Three Sisters Irrigation District	Marc Thalacker, Manager	Phone: (541) 419-5850 E-mail:

Notes: Interviewed on 2/17/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

Installation of Irrigation Water Distribution Pipeline (Source: Three Sisters Irrigation District).

Project Narrative

The District operates an irrigation water distribution system which diverts water from Whychus Creek for distribution to industrial and agricultural users in central Oregon. Much of the District's distribution system is composed of unlined, earthen canals which were hand dug approximately 100 years ago. According to documentation provided by the District's Manager, Marc Thalacker, these canals provide irrigation water for 1,976 acres on 31 farms in Central Oregon. Earthen canals of this type are capable of water losses of up to 40 percent of flow due to seepage and evapotranspiration.

The purpose of this project was the replacement of 3.2 miles of existing earthen canal with a HDPE gravity-flow pipeline, which will substantially reduce water losses in the distribution system and reduce pumping costs. In addition, rather than utilizing the water saved through this project, the District will permanently decrease the quantity of flow diverted during the irrigation season (May to September) from Whychus Creek by a magnitude equal to their water savings—approximately 3.6 cfs. During the summer, Whychus Creek suffers from extreme low flows and provides habitat for ESA listed species including bull trout and redband trout. Finally, converting the open channel canals to an enclosed pipeline made it feasible for the District to remove 38 pumps from service, resulting in additional energy savings. Construction on the pipeline was completed and began service in May 2010.

Project Components and Associated Costs:

- A total pipeline length of 3.2 miles (16,550 feet). Sections of pipeline were 36-inch (3,650 feet), 18-inch (1,400 feet), and 16-inch (11,600 feet) of HDPE pipe. Capital costs for the pipeline totaled $1,895,403.

Project Benefits

- Reduced water losses in the irrigation system by 3.6 cfs (i.e., approximately 2.3 million gallons per day).
- Restored approximately 3.6 cfs of flow to Whychus Creek. The addition of 3.6 cfs of flow to the creek will make it possible to reintroduce endangered trout species to the creek.
- Installation of the pipeline made it feasible to remove 38 pumps from service which results in energy reduction of 3 million kWh annually, worth approximately $220,000 per year.

Project Cost/Benefit Calculations

- Mr. Thalacker verified that the District has decreased their water diversions from the Whychus Creek by 3.6 cfs since construction was completed on the new pipeline. Over a 20 year project life, this project will save approximately 36,000 gallons of water per dollar invested.
- Based on an annual energy savings value of $220,000, the payback period for this project is approximately 2 years.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 2/28/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/8/2012

GPR Technical Project Information Reports

EPA REGION 10

Washington

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
10 - Seattle	WA	City of Airway Heights	L0900007

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: RE

Total SRF Loan Amount: $23,141,325

ARRA Loan Amount: $22,974,618

GPR Category Loan Amount: WE - $7,000,000

Principle Forgiveness Amount: $13,646,092

Loan Payback Period: 20 Years

General Project Description:

The City of Airway Heights (City) has constructed a new wastewater treatment plant (Facility) which is capable of producing recycled water. All effluent from the Facility is recycled by the City or is used for groundwater recharge.

Primary Environmental Benefits:

This project reduces the quantity of potable water consumed by the City.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: IMCO General Construction Website. Retrieved on 5/31/2012. <http://www.imco-inc.com/featured%20projects/airway/index.php>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
Century West Engineering Coporation	Brian Ilgen, Project Manager	Phone: (509) 838-3810 E-mail: bilgen@centurywest.com

Notes: Interviewed on 4/25/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Construction of the New Wastewater Treatment Plant (Source: Century West Engineering Corporation).

Project Narrative

The City has undertaken a project to construct a 1.0 MGD wastewater treatment plant (Facility) capable of producing a high-quality effluent suitable for reuse. This project eliminates the Airway Heights effluent discharge to the Spokane River, which is under a total maximum daily load (TMDL) for dissolved oxygen, and utilizes the effluent to recharge the West Plains aquifer. The project includes construction of a new headworks building, final treatment building, dewatering building, a return activated sludge/waste activated sludge pumping building; a short term covered storage lagoon, a storage tank, an influent pump station, and various miscellaneous site work. This Facility will provide sewage treatment for a population of 5,360 residents. Construction on the project began in January 2009. The project began operations in November 2011.

Project Components and Associated Costs:

The total project cost was approximately $43,000,000. Itemized costs were not available. The total project cost encompasses the cost of the following items:

- Final treatment building and filters.
- Reclaimed water pump station.
- Percolation beds and dosing system.
- Reclaimed water distribution main.
- Instrumentation and control.

Project Benefits

- The project reuses up to one MGD of effluent for groundwater recharge.
- This project eliminates discharges of oxygen demanding pollutants to the Spokane River which is a 303(d) listed waterbody and possesses an active TMDL of dissolved oxygen.

Project Cost/Benefit Calculations

- The project is anticipated to save up to 1,040 gallons of water per dollar invested over a 20 project life.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/1/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
10 - Seattle	WA	City of Arlington	L1000024

Primary GPR Category:

EE - Energy Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: EP

Total SRF Loan Amount: $15,007,660

ARRA Loan Amount: $5,540,000

GPR Category Loan Amount: EE - $899,481

Principle Forgiveness Amount: $0

Loan Payback Period: 20 Years

General Project Description:

The City of Arlington (City) has undertaken a project to upgrade the aeration system at the Arlington Wastewater Treatment Plant (Facility) in order to meet total maximum daily load (TMDL) requirements for the Stellaguamish River.

Primary Environmental Benefits:

This project will improve energy efficiency at the Facility.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☒ **Yes** ☐ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: City of Arlington Website. Retrieved on 6/1/2012. <http://www.arlingtonwa.gov/index.aspx?page=349>

Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
City of Arlington	James Kelly, Project Manager	Phone: (360) 403-3505 E-mail: jkelly@arlingtonwa.gov

Notes: Interviewed on 4/24/2012

Entity	Contact Name and Title	Contact Phone Number / Email
		Phone: ( ) - E-mail:

Notes:

The above information was taken from the sources listed in the Project Information Resources.
PG has not verified any assumptions, estimates, or calculations.

Installation of Diffusers (Source: City of Arlington).

Project Narrative

The Facility, which has a 2.7 MGD maximum month permitted flow and provides sewage treatment for approximately 17,000 residents, will be upgraded and expanded to a MBR facility to meet projected growth and expected regulatory requirements through 2025. This project is part of improvements that will include installing new fine screens at the existing headworks, installing new reactors for UV disinfection, converting the existing SBR basins to aerobic digesters and aeration basins, installing new sludge pumping and dewatering equipment, constructing new MBR tankage and associated Support Building, and expanding the existing solids handling building, among other things.

The project includes strip diffusers in the aeration basins and the aerobic digesters. Strip diffusers are the highest efficiency diffusers available on the market. The diffusers are a replacement for the existing diffuser system, but do not by itself achieve a 20% energy savings. The overall aeration system was designed to optimize efficiency, employing properly sized aeration blowers equipped with VFDs, feedback control, optimized DO set points, and properly designed piping systems to minimize friction losses.

Project Components and Associated Costs:

The total project cost was $899,000. An itemized list of project components provided by the project contact, James Kelly, are as follows:

- Approximately 170 thermoplastic membrane strip diffusers, manufactured by Aerostrip, and four 100 hp Sutorbilt positive displacement blowers ($395,000).
- Aeration controls for aeration basins ($116,000).
- Three new 75 hp blowers for aerobic digesters, including VFDs ($336,000)

Project Benefits

- According to Mr. Kelly, City audits have demonstrated that the system upgrades have reduced electricity consumption by 2,070,750 kWh per year. Mr. Kelly was unable to provide the cash value of this energy savings. Assuming an electricity price of $0.11 per kWh, anticipated savings are worth approximately $228,000.

Project Cost/Benefit Calculations

- Assuming annual savings of $228,000 per year, the simple payback period of this GPR loan is approximately 4 years.
- The expected energy saved over a 20 year project life is approximately 46 kWh per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 6/1/2012

Reviewed By: Craig Blett (PG Environmental, LLC) on 7/25/2012

American Recovery and Investment Act of 2009
Green Project Reserve – Technical Project Information

EPA Region:	State:	ARRA Recipient	CWSRF Loan No.
10 - Seattle	WA	LOTT Clean Water Alliance	L1000016

Primary GPR Category:

WE - Water Efficiency

Secondary GPR Category:

Other GPR Category:

GPR Subcategory: RE

Total SRF Loan Amount: $2,148,796

ARRA Loan Amount: $2,148,796

GPR Category Loan Amount: WE - $2,148,796

Principle Forgiveness Amount: $1,074,398

Loan Payback Period: 20 Years

General Project Description:

The LOTT (Lacey, Olympia, Tumwater, and Thurston County) Clean Water Alliance (previously known as the LOTT Wastewater Alliance); (hereafter, LOTT) has undertaken a water distribution project which distributed reclaimed water from the Budd Inlet Reclaimed Water Plant (Facility) to the Tumwater Valley Municipal Golf Course.

Primary Environmental Benefits:

This project will reduce pollutant loadings to the Budd Inlet and reduce potable water consumption in the LOTT service area.

Project Information Resources:

SRF / ARRA Application Obtained from State ☐ **Yes** ☒ **No**

CWSRF Benefits Reporting Information Obtained ☒ **Yes** ☐ **No**

SRF Business Case Information Obtained ☐ **Yes** ☒ **No**

Internet Search Performed ☒ **Yes** ☐ **No**

Sources: SEPA Environmental Checklist for project. Retreived on 3/1/2012. <http://www.lottcleanwater.org/pdf/DeschutesSepa.pdf>

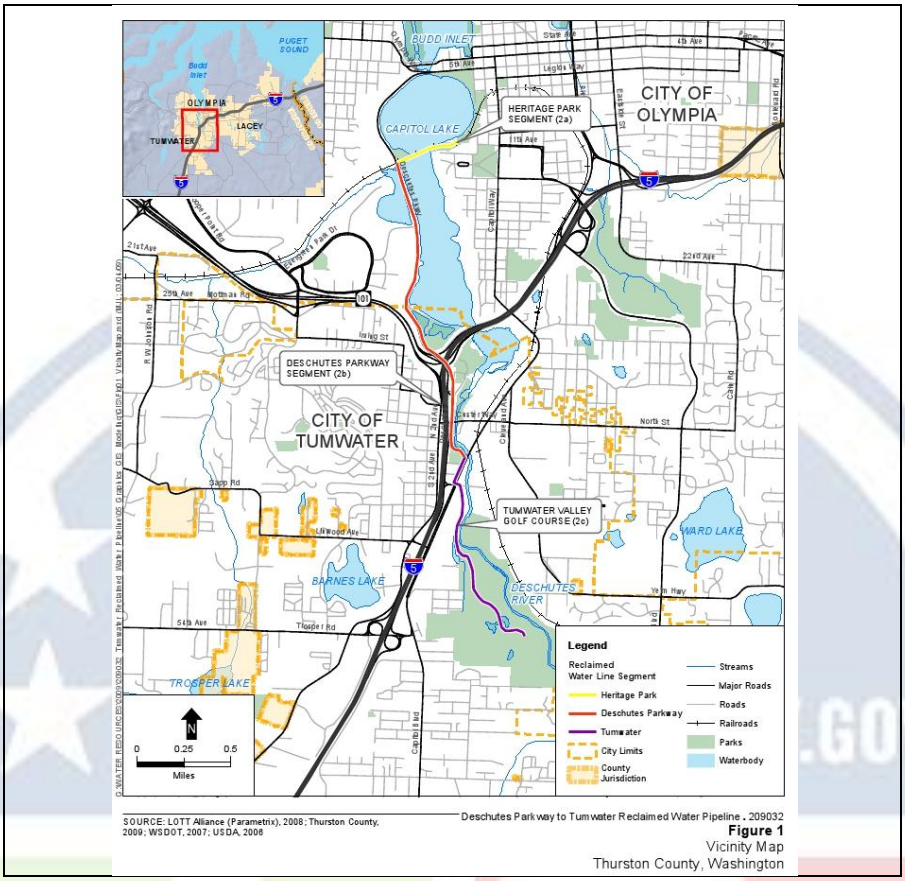
Other Information Obtained ☐ **Yes** ☒ **No**

Sources:

Contact Information:

Entity	Contact Name and Title	Contact Phone Number / Email
LOTT Clean Water Alliance	Howard Weisberg, Project Manager	Phone: (360) 528-5701 E-mail: HowardWeisberg@lottcleanwater. org

Notes: Interviewed on 2/16/2012



System Map (Source: LOTT).

Project Narrative

LOTT produces high quality reclaimed water from the Facility located in downtown Olympia which it distributes to its customers in downtown Olympia. As part of a long-term plan to expand the distribution system, LOTT plans to add new customers including the Tumwater Valley Golf Course (Tumwater). Peak demand for reclaimed water by Tumwater and other customers in LOTT's distribution network occasionally exceeds the production capacity of the Facility. Therefore, LOTT has developed a long-term management plan which involves introducing new storage capacity into their existing distribution system and adding additional distribution lines to Tumwater and in West Olympia to accommodate other new reclaimed water customers. LOTT supplies recycled water to its customers free of charge.

The GPR funded portion of this project involved the construction of a 3.2 mile HDPE reclaimed water distribution pipeline running south from the Facility along Deschutes Parkway to Tumwater. When reclaimed water supplied to Tumwater exceeds their demand, the excess product is stored at a 1.0 MG reservoir located at Tumwater. On average, 1.5 MGD of reclaimed water are transported in the pipeline and average demand at Tumwater is 0.6 MGD. Stored water may be used to meet peak demand or is allowed to percolate to groundwater. Substantial completion on the pipeline was completed in June 2010.

Project Components and Associated Costs:

- 3.2 miles of 18-inch diameter HDPE pipeline ($2,149,000).

Project Benefits:

- This project reclaims 1.5 MGD of effluent for reuse rather than discharging to their receiving water, Budd Inlet. Budd Inlet is currently regulated under an active Total Maximum Daily Load (TMDL) for temperature, fecal coliform bacteria, dissolved oxygen, pH, and sediment.
- Tumwater will use recycled water in place of groundwater pumped from wells located at the golf course.

Project Cost/Benefit Calculations:

- Over a 20 year project life, this project will save approximately 14 gallons of water per dollar invested.

Prepared By: Matthew Reusswig (PG Environmental, LLC) on 3/1/2012

Reviewed By: Luz Slauter (PG Environmental, LLC) on 5/8/2012