

US EPA ARCHIVE DOCUMENT

**State Innovation Grant Project
Narragansett Bay Commission
Progress Report –13
October 1, 2011 – December 31, 2011**

Project Title: Sustainable Energy Management Practices for Wastewater Treatment Facilities

Part 1 – Synopsis of Accomplishments

During the current Project Reporting Period October 1, 2011 through December 31, 2011 the following activities took place: the Project Partners (NBC, RIDEM, URI, National Grid, RIMES and EPA) continued to meet and participate on conference calls to discuss and plan activities associated with project development and implementation, NBC continued collecting energy use data from RI WWTFs for benchmarking, work on investigating the potential use of biodiesel glycerin as a wastewater treatment carbon source NBC's Pollution Prevention Engineer continued to research renewable energy opportunities for RI WWTFs with a focus on solar energy applications and continued working with URI to investigate alternative sources of anaerobic digester feed (waste) materials to help improve biogas production, NBC and National Grid continued working on Phase II Technical Assessments and NBC finalized the FOG-ERP Workbook for distribution to local restaurants.

Part 2 – Summary of Activities Accomplishments

I. WWTF Energy Focused Environmental Management System Project

EF-EMS Steering Committee

Throughout the previous Project Period (October 1, 2011 – December 31, 2011) the EF-EMS Steering Committee continued to coordinate efforts with Rhode Island Office of Energy Resources (RIOER) with respect to conducting Energy Efficiency Technical Assessments (TAs) and Wastewater Treatment Facilities Energy Efficiency Upgrades. NBC previously received approval to utilize \$23,000 in ARRA grant funds remaining from the first round of 11 TAs to pay for ½ the costs of conducting additional TAs of potential energy efficiency projects participating RI WWTF. The other ½ of the TA costs being provided by National Grid. The Phase II studies include:

- Bristol - Solids handling
- East Providence - Pump station
- Fields Point - Bisulfite Building
- Fields Point - Pump Station
- Newport - Solids Handling
- South Kingstown - Pump stations and Solids Handling
- Warwick – Pump Stations
- West Warwick – Head-Works and Solids Handling
- Westerly – Pump Stations

Energy Audits/Scoping Studies and Technical Assessments

Throughout the last project period the following activities took place regarding organizing and coordinating on-going and future Energy Efficiency Technical Assessments:

- On Tuesday, November 15, 2011 the ESTA Manager and P2 Engineer attended a meeting with Eric Studer of TNZ and National Grid in the PP&R Conference Room regarding Technical Assessments for Energy Efficiency
- On Thursday, November 17, 2011 the ESTA Manager and P2 Engineer attended a telephone meeting with TNZ and National Grid regarding technical assessments for Energy Efficiency

To-date Scoping Studies and/or Phase I Technical Assessments have been conducted of the following WWTFs:

Facility	Date	Energy Team Leader
Jamestown WWTF	July 1, 2009	Action Energy
Narragansett WWTF (Scarborough)	July 14, 2009	Action Energy
Bucklin Point WWTF	July 22, 2009	Action Energy
QPDC WWCP	August 25, 2009	NBC
Burrville WWTF	February 23, 2010	DMI
Smithfield WWTF	March 10, 2010	DMI
Cranston WWTF	March 24, 2010	DMI
South Kingstown	April 7, 2010	DMI
Quonset Point	April 21, 2010	DMI
Newport	April 28, 2010	DMI
Warren	May 5, 2010	DMI
East Greenwich	May 12, 2010	DMI
Bucklin Point	May 19, 2010	DMI
Jamestown	May 26, 2010	DMI
Westerly	June 9, 2010	DMI
West Warwick	June 16, 2010	DMI
East Providence	July 8, 2010	DMI
Bristol	May 2011	TNZ-TA
Bucklin Point WWTF	May 2011	TNZ-TA
East Providence	May 2011	TNZ-TA
Jamestown	May 2011	TNZ –TA

Facility	Date	Energy Team Leader
Scarborough	May 2011	TNZ –TA
Smithfield	May 2011	TNZ –TA
South Kingstown	May 2011	TNZ –TA
West Warwick	May 2011	TNZ –TA
Westerly	May 23, 2011	TNZ –TA
Woonsocket	May 2011	TNZ –TA
New Shoreham	June 29, 2011	TNZ –TA

II. FOG Environmental Results Program Project

Biodiesel/Glycerin

In response to a request from the NBC's Bucklin Point (BP) WWTF, investigations have been initiated into the feasibility of utilizing a glycerin by-product from the production of biodiesel as a carbon source within the BP WWTF's biological nutrient removal (BNR) process. The BP WWTF BNR process consists of nitrification in which ammonia nitrogen is oxidized to form nitrate nitrogen followed by de-nitrification in which nitrate nitrogen is reduced to nitric oxide, nitrous oxide and nitrogen gas. In an effort to improve the effectiveness of the de-nitrification step the NBC is conducting a pilot study using glycerin, generated as a by-product from the local production of biodiesel, as a carbon source within the BNR de-nitrification process. The glycerin is injected into the anoxic zone of one aeration tank treatment train at the surface mixer. This allows for adequate mixing of the glycerin at a point within the treatment process where available carbon is at a minimum. The effect of the glycerin on treatment operation is monitored through the use of in-line sensors and sample collection and analysis. Efforts associated with this project were halted due to low atmospheric temperatures which tend to slowdown the biological nitrification/de-nitrification process. A second sample collection pilot study was conducted in August 2011. No SIG grant funds are being used for this study.

Restaurant FOG Self-Certification Workbook

A reformatted FOG Self-Certification Workbook has been completed for distribution to local restaurants and food-service business.

URI Anaerobic Digestion Biogas Project

Throughout this project period NBC continued efforts with URI regarding research on anaerobic digestion by supplying URI with various samples of digester sludge from the BP WWTF.

III. Miscellaneous Activities

Water Environment and Technology Abstract

On Monday, November 14, 2011 NBC's Pollution Prevention Engineer submitted an abstract for an article on the Bucklin Point Biogas Engine Project to be considered for publication in Water Environment and Technology journal.

Part 3 – Projection of Activities, Accomplishments, and Major Expenditures for Next Quarter Report

I. WWTF Energy Focused Environmental Management System Project

- A Roundtable Meeting will be scheduled for March/April 2012
- Complete Phase II of the Energy Use Technical Assessments in cooperation with National Grid and the RIOER by March 31 2012

II. FOG Environmental Results Program Project

- Distribute FOG-ERP Workbook – Mail out workbook and certification checklists
- FOG-ERP Steering Committee – Form Steering Committee and schedule first meeting

Part 4 – Financial Report

Project Expenses

A summary of grant related expenses to-date is as follows:

[CBI Removed by EPA]

Attachments:

1. Project Milestone Summary Table
2. FOG ERP Workbook