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Office of Policy, Economics and Innovation  
Washington, D.C. 20460

**NBC State Innovation Grant Project Work Plan**  
July 2008

**I. Project Title**

Sustainable Energy Management Practices for Wastewater Treatment Facilities

**II. Applicant Information**

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**III. Funding Requested**

\$ 275,000	<b>Funding requested from EPA</b>
\$ 75,000	<b>NBC leverage matching funds</b>
\$ 29,760	<b>URI leverage funds</b>
\$ 379,760	<b>Total project costs</b>

**IV. Project Period**

September 1, 2008	<b>Project start date</b>
September 30, 2012	<b>Project completion date</b>

## V. Narrative

### A. Project Overview

Municipal Wastewater Treatment Facilities (WWTF), throughout the United States, play an important role in protecting human health and the environment. WWTF operations are in general large energy users and while designed and operated to reduce the environmental impacts of municipal wastewater (i.e. BOD, nutrients, solids) on local receiving waters, they can and do create other impacts particularly through the large consumption of fossil fuels (e.g., greenhouse gas emissions).

Through this project the Narragansett Bay Commission (NBC), the Rhode Island Department of Environmental Management (RIDEM), the University of Rhode Island (URI), and the Rhode Island Manufacturers Extension Service (RIMES) (the Project Partners) will address two important concerns common to almost all WWTF operations nationally if not worldwide – energy consumption by wastewater collection and treatment operations and the detrimental impacts to sewer systems from the discharge of waste Fats, Oil and Grease (FOG) from the Food Service Industry Sector (i.e. restaurants). As part of these efforts the Project Partners will develop and implement a Sustainable Energy Focused Environmental Management System (EF-EMS) Program for WWTF, based on the well established ISO 14001 Environmental Management System (EMS) “Plan-Do-Check-Act” approach and will develop and implement an Environmental Results Program (ERP) designed to improve the management and collection of FOG waste generated by restaurants and food processing operations. For the purposes of this project a WWTF Sustainable EF-EMS is recognized as consisting of practices, procedures, policies and technologies that put in place today will continuously support and sustain WWTF operations indefinitely into the future. A successfully implemented Sustainable EF-EMS Program will reduce the consumption of non-renewable energy resources while preventing or at least minimizing overall environmental impacts.

The Sustainable EF-EMS component of the project will help to address energy use concerns of WWTF and the ERP component will help to reduce problematic FOG discharges to the sewer system with a focus on utilizing collected FOG as a renewable energy source through the production of bio-diesel and/or biogas (methane). Based on information gained through various historical and on-going NBC energy management projects and activities it is anticipated that this project could improve the energy efficiency of participating WWTFs by a minimum of 5 to 10 %, and decrease a participating WWTF’s energy demand from the local power grid as much as 10 to 20% by using available renewable energy resources. Anticipated project results associated with the ERP approach include increased use of identified Waste FOG Best Management Practices by participating restaurants, an increase in the quantity of waste FOG being used for bio-diesel production in the State of Rhode Island, and a decrease in FOG detected at the head-works of NBC’s two WWTFs. Quantified measurements will be determined during an initial “Baseline Performance Assessment” conducted at the onset of the ERP

### B. Problem Statement

The U.S. has an estimated 16,225 operating Wastewater Treatment Facilities (WWTF).<sup>1</sup> Combined, these facilities service 73% of the 1996 U.S. population (190 million people) and treat more than 40 billion gallons of wastewater on a daily basis. WWTFs are large energy users, and as such can impact the environment through greenhouse gas emissions from large consumption of fossil fuels. With large, energy demanding equipment such as pumps, motors, and blowers operating 24 hours/day 365 days/year, wastewater treatment operations are often the most energy intensive service provided for within a community or municipality. Because many of today's WWTFs were designed and constructed at a time when energy consumption was not of primary concern, tremendous opportunities now exist for WWTFs to improve upon existing energy management practices and procedures. Also, while seemingly unrelated to WWTF energy issues, an on-going problem common to almost all WWTFs is the impact of waste FOG from the Food Service Industry on wastewater collection and treatment operations. Waste FOG discharged to the sewer results in sewer line blockages and increases operational costs associated with collecting, treating and disposing of FOG received at the WWTF. For example in May of 2008 NBC's Field's Point WWTF collected and removed 88 dry tons of "scum" made up primarily of FOG and other floatable waste material. Recent efforts by the City of Millbrae California<sup>2</sup> have demonstrated that waste FOG can be successfully diverted away from wastewater treatment operations and used as an energy source in the production of bio-diesel fuel and methane rich bio-gas with an anaerobic digester.

In the State of Rhode Island, municipal wastewater is handled by 19 individual WWTFs that are capable of receiving and treating up to 200 million gallons per day (MGD) of municipal wastewater. Based on standardized energy consumption data and assumed peak energy efficiency performance<sup>3</sup>, these facilities combined consume more than 78,000 MWH of electricity annually at a cost of more than \$9 million.

### C. Technical Approach.

The Project Partners in cooperation with various stakeholders will help Rhode Island WWTFs meet or exceed their peak energy efficiency potential while improving wastewater treatment operations and the quality of treated wastewater effluent through the development and implementation of:

- A Sustainable EF-EMS Program for WWTFs, utilizing EPA's Ensuring a Sustainable Future: An Energy Management Guidebook for Wastewater and Water Utilities ("the EPA Energy Guidebook"), modeled on the ISO 14001 EMS "Plan-Do-Check-Act" approach, and designed to identify energy efficiency and conservation opportunities and potential applications for the use of available renewable energy source, including but not limited to wind power and the use of waste FOG as an alternative energy source; and

<sup>1</sup> USEPA, Clean Watersheds Needs Survey 2000, Report to Congress, EPA-841-R-03-001, 2003. ([www.epa.gov/owm/mtb/cwns/](http://www.epa.gov/owm/mtb/cwns/))

<sup>2</sup> <http://www.nacwa.org/images/stories/public/07pret/2007pret-k.bell.pdf>

<sup>3</sup> Water Environment Federation, WEF Manual of Practice No. FD-2

- An Environmental Results Program (ERP) focusing on the management of waste FOG from the Food Service Industry designed to decrease the quantity of waste FOG being discharged to the sewer systems and divert collected waste FOG to energy recovery applications such as bio-diesel production and bio-gas production through anaerobic digestion.

The four Project Partners, NBC, URI, RIDEM, and RIMES each have extensive experiences and familiarities with different aspects of the overall project activities and tasks. NBC has had great success with, and continues to work and improve upon, energy management practices at its two WWTF and has experience working with RIDEM and URI on two ERP projects involving auto-body and auto-salvage yards in the State of Rhode Island. URI and RIDEM bring a tremendous amount of experience developing and implementing successful ERPs and using statistical techniques to evaluate project results and outcomes. It is anticipated that NBC's and URI's efforts will be equally divided and shared among all project task and activities with the majority RIDEM's efforts focusing on ERP development and evaluation activities. A fourth partner in the project is the Rhode Island Manufacturers Extension Services (RIMES) a non-profit organization which provides manufacturing solutions to small and medium-size Rhode Island businesses has the expertise and experience to help with the EMS development and training aspect of the project.

## 1. Goals and Objectives.

### *Project Objective 1 – Establish and Implement Organized WWTF Energy Focused Environmental Management Systems Utilizing the Plan-Do-Check-Act Approach*

Utilizing the EPA Energy Guidebook the Project Partners will train participating Rhode Island WWTFs on how to establish and implement successful Plan-Do-Check-Act systems for implementing an Energy Focused Environmental Management System (EF-EMS). The following is a list of identified tasks associated with meeting this project objective:

- i. *Energy Management System Steering Committee* – A Steering Committee will be formed in order to give guidance to the Project Partners on the development of the overall WWTF EF-EMS Program. Steering Committee members will include, but may not be limited to representatives from: RIDEM, NBC, EPA, RIMES, the Rhode Island Office of Energy Resources, NEWEA, NWPCA, the PEER Center at UMass Lowell, and National Grid. At a minimum the Steering Committee will:
  - a. Help address potential project roadblocks and to help identify and develop various incentives for WWTF to participate in the project.
  - b. Review and comment on the EF-EMS training program documents and curriculum, and
  - c. Review, comment and assist with data collection activities including but not limited to:
    1. Identifying and documenting processes and procedures to be used for managing all collected data,
    2. Documenting all “Lessons Learned” gained from project activities, and

3. Documenting all information need to support final project conclusions.
- ii. *Develop an Energy Focused Environmental Management System Training Program for WWTFs* – Utilizing EPA’s Energy Guidebook NBC, URI and RIMES will develop a curriculum and training program on how to develop and implement an Energy Management System Plan-Do-Check-Act process for evaluating and implementing a Sustainable Energy Management Program by WWTFs. The Project Partners will invite and make every effort to encourage participation by National Grid in both the development and implementation of the EF-EMS Training Program.
  - iii. *Hold Project Kick-Off Meeting/Workshop* - The Project Partners will develop, organize and conduct a meeting/workshop to announce the initiation of the overall “Sustainable Energy Management Practices for Wastewater Treatment Facilities” project. Invited participants will include but not be limited to representatives from all Rhode Island WWTFs, EPA, National Grid and the Rhode Island State Energy Office. This meeting/workshop will discuss the goals and objectives of the Sustainable Energy Management Practices for Wastewater Treatment Facilities project, and will give an introductory overview to attending WWTFs on how to utilize EPA’s Portfolio Manager<sup>4</sup>. Rhode Island WWTFs attending this workshop will be shown the benefits of developing a Sustainable Energy Management Program (i.e. cost savings, recognition, decreased energy dependency, etc.) and will be encouraged to participate in the program. Task Objectives include: imparting a clear understanding of the project goals and objectives to the attending audience, encouraging the participation of each Rhode Island WWTFs and having each participating WWTF identify an EF-EMS “Champion” or “Champions” from within their organization that have the appropriate professional capability and authority to oversee the development of their EF-EMS. The main target audience for the Kick-Off Meeting/Workshop will be representatives from each WWTF at the management and/or policy making level and/or city/town officials as appropriate.
  - iv. *Hold an EPA Energy Guidebook Training Workshop for Participating WWTFs* – The Project Partners will develop, organize and conduct a full-day training workshop on how to develop an Energy Management System for WWTFs using EPA’s Energy Guidebook. At the conclusion of the training program each participant will be prepared to begin the development of a site specific Energy Management System for their WWTF. The target audience for the EF-EMS Workshop will be the EF-EMS “Champion(s)” from each participating WWTF. A portion of this training session will be used to train participants on how to best collect energy use data for eventual entry into the Portfolio Manager database. The Workshop topics will include but not be limited to:
    - a. An introduction to all Sections/Modules of the EPA Energy Guidebook,
    - b. An overview of renewable energy opportunities applicable and available to Rhode Island WWTFs (i.e. wind, solar, bio-gas, and small hydro-electric) with a focus on the costs, limitations and benefits of each technology, and

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<sup>4</sup> [http://www.energystar.gov/index.cfm?c=government.wastewater\\_drinking\\_water](http://www.energystar.gov/index.cfm?c=government.wastewater_drinking_water)



- c. An introduction to the use of EPA's Energy Star Portfolio Manager
- v. *Develop an energy use baseline for each participating WWTF* – A ½ day workshop will be offered on the use of EPA's Energy Star Portfolio Manager. As part of the trainings session participating WWTFs will bring energy use data from their respective facilities and will enter the collected energy use data into the Portfolio Manager. The target audience for this workshop will be the WWTF EF-EMS Champions and other required WWTF staff with an understanding of their facility's energy use and operations.
- vi. *Establish a Roundtable to assist each Participating WWTF with Implementing their EF-EMS* – NBC, URI and RIMES will establish an EF-EMS Roundtable with members consisting of representatives from NBC, URI, RIMES, the EF-EMS Champions from participating WWTFs and other representatives from the participating WWTF as may be needed. The Roundtable will serve as a venue for participating WWTF to receive guidance and direction on developing their individual EF-EMSs. The Roundtable will hold 6 to 12 monthly meetings with each meeting focusing on progressive Session/Modules contained in the EPA Energy Guidebook. The goal of the Roundtable meetings will to have a working EF-EMS in place at each participating WWTF within 6 months to one year of the first meeting. Ideally members of the Roundtable will continue to meet on a regular basis upon completion of the overall Project. During each meeting of the EF-EMS Roundtable participants will:
  - a. Work on the development of specific portions of their EF-EMS,
  - b. Receive guidance and directions from RIMES, NBC and URI and others as needed (i.e. National Grid),
  - c. Discuss issues, concerns, problems and success stories among the participating WWTF, and
  - d. Receive “homework” assignments to be completed in preparation o the next Roundtable meeting
- vii. *Conduct WWTF Energy Use Assessments* – An Energy Use Assessment Team consisting of representatives of NBC, URI, RIMES (RIMES is committed to participating in four assessments), invited representatives of National Grid, and possibly others identified as part of the Steering Committee meeting will perform on-site facility Energy Use Assessments of participating WWTF. Each participating WWTF will receive an Energy Assessment Report that summarizes the findings of the assessment and will include information on potential renewable energy opportunities, economic issues and concerns, energy measurement information, energy improvement activities noted during the visits and suggestions on how implement an effective EF-EMS. Energy Use Assessment activities will take place concurrently with both EF-EMS Training and Roundtable activities. At a minimum each Energy Use Assessment will be conducted and designed to:
  - a. Identify potential Energy Conservation and Efficiency Measures (ECEMs) – The Energy Use Assessment Team will assist each participating WWTF with

- identifying operational and/or maintenance practices that result in more efficient use of energy at each participating facility,
- b. Identify High Energy WWTF Equipment – The Energy Use Assessment Team will assist participating WWTFs with identifying and developing a list of all major energy-consuming pieces of equipment with their facility.
  - c. Quantify Energy Equipment Demand - Using a combination of published standard energy use data and taking readings of on-site energy use the Energy Use Assessment Team will assist participating WWTFs with collecting and compiling equipment/process specific energy demand data including the power draw and overall efficiency of each identified piece of equipment.
  - d. Help each participating WWTF with collecting information on operational processes (activated sludge, trickling filter, wastewater conveyance, sludge management techniques, etc.) including the quantity of wastewater treated, quantity of waste FOG/scum collected by each WWTF, and the particular treatment standards achieved (BOD removal, TSS removal, nutrient removal).
  - e. Assess and Documents Energy Billing Procedures – The Energy Use Assessment Team will assist participating WWTFs with obtaining a clear understanding of the procedures used by their applicable power companies to bill for energy consumption. This task may help to identify opportunities for costs savings through better management of peak energy use and power factor correction activities,
  - f. Assess Renewable Energy Resource Opportunities – The Energy Use Assessment Team will conduct site specific assessments on the potential use of wind energy, solar energy, bio-fuels and hydro-electric energy at each participating WWTF, and
  - g. Assess the implementation of the Plan-Do-Check-Act aspect of each EF-EMS.
- viii. *Assess Project Success* –NBC, URI and RIDEM will assess and document overall project success by:
- a. Reviewing and analyzing WWTF energy use data collected by participating WWTFs using the Energy Star Portfolio Manager or other tracking system that may be employed by the WWTFs,
  - b. Conducting follow-up site visits of each participating WWTF as needed to collect information on energy related activities, and assess the overall successfulness of the Plan-Do-Check-Act approach of the EF-EMS,
  - c. Equate energy use reduction and increased use of renewable energy with Green-House Gas reductions, and
  - d. Documenting all findings in a final Project Report.

***Project Objective 2 – Develop a Fats, Oil and Grease (FOG) ERP for Restaurants***



Fats, Oil and Grease (FOG) that enters the sewer system from food preparation processes is a continuing problem for WWTF operations. FOG can cause sewer line obstructions, cause problems with pumps and other WWTF equipment and can inhibit overall wastewater treatment effectiveness.

Restaurants generate two forms of FOG – “Yellow Grease” consisting of used vegetable oil that may often be contaminated with fried food residue and “Brown Grease” consisting of residual FOG removed from the wastewater stream through the use of Grease Removal Units (GRUs) - NBC limits FOG levels in commercial and industrial wastewater to 125 mg/l. Yellow Grease can be potentially used a source of renewable energy though the production of bio-diesel and collected Brown Grease can potentially be used in anaerobic digestion of waste sludge to boost methane generation.

Tasks associated with achieving this Objective include: 1) developing and implementing an ERP for the collection and management of FOG at food processing facilities located within the NBC servicing district, and 2) identifying both opportunities and problems associated with using collected FOG as a precursor to the production of bio-diesel and use in anaerobic digestion operations to boost bio-gas production.

The ERP will improve compliance through education, self-certification, and on site technical assistance. Statistical analysis will be employed to confirm compliance improvement results. The following is a list of identified tasks associated with meeting this project objective:

- i. *Steering committee.* A steering committee will be formed that may include, but will be not limited to representatives from NBC, DEM, URI, Rhode Island based restaurant/hospitality organizations and representatives of Rhode Island’s two bio-diesel production facilities. The committee will meet throughout the project to review work completed, share recommendations, and discuss project progress. The Steering Committee will be charged initially and specifically with investigating issues and concerns associated with conducting some limited baseline GRU wastewater effluent sample collection and analysis contingent upon EPA Laboratory assistance.
- ii. *Identification of industry sector universe.* NBC supplies wastewater collection and treatment services to approximately 500 restaurants. All NBC permitted restaurants will be included as participants in the ERP i.e. all will receive a baseline assessment, each will be given a set of BMPs to implement and all will receive follow-up assessments. As part of this task the Project Partners will contact, and if possible, conduct site visits of identified end users of “Yellow” Grease (i.e. Bio-Diesel Production Facilities, Grease Rendering Facilities).
- iii. *Develop a FOG Management Checklist and set of Best Management Practice (BMP) Factsheets.* The Project Partners will develop a set of Waste FOG Management BMPs and will create a checklist to be used for certifying the use of identified BMPs and tracking and recording compliance indicators. The BMPs will be designed to improve regulatory compliance and where feasible go “beyond” compliance. BMPs will at a minimum address: the proper use and maintenance of GRUs, application of pollution prevention practices (e.g., FOG separation before washing), maintenance of drainage pipes, tracking and recording ultimate Yellow and Brown Grease management (i.e. quantities of FOG being used for energy recovery), and employee education. Applicable and measurable compliance indicators will be identified by NBC’s

Pretreatment Treatment (PT) staff. The checklist will be used by NBC's Pretreatment Treatment (PT) staff during initial and follow-up site assessments of each restaurant to be conducted as part of their annual regulatory inspections. Each BMP will include instructions explaining how to implement the suggested BMP and why the BMP should be implemented.

- iv. *Perform trial checklist runs.* The Project Partners will accompany NBC PT staff on at least 2-3 "inspections" to try out the FOG management checklist. Results and feedback from these trial runs will be used to modify the checklist accordingly.
- v. *Kick-off workshop.* A workshop will be held to announce the new ERP initiative. Announcements will be made through restaurant and hospitality networks and direct mailings.
- vi. *ERP Assessments.* As part of their regulatory activities the staff of NBC's Pretreatment (PT) Program performs inspections of between 50 to 75% of all permitted restaurants annually. As part of their regular inspection PT staff will fill out a FOG Management checklist and hand out copies of suggested BMPs along with a FOG Management "Self-Certification" form to restaurants management staff. During the first 18 months of the project NBC PT staff will visit and fill out checklists of each permitted restaurant. The checklist will supply baseline process operations data for each restaurant that will be combined with NBC operational baseline data (including but not be limited to historic quantities of FOG received at NBC's two WWTF and historic quantities of "scum" removed from each WWTF) to form a Project Performance Baseline. PT staff will subsequently revisit and fill out follow-up checklists for each permitted restaurants. At least 6 months will be allowed between initial and follow-up assessments. All NBC permitted restaurants will receive initial and follow-up ERP assessments conducted as part of and in conjunction with NBC PT regulatory inspection activities.
- vii. *ERP Certification.* As part of the initial ERP assessment each restaurant will be given a "Self-Certification" form and will be asked to fill out individual sections of the Self Certification Form as they implement the suggested BMPs. Upon completion the restaurants will maintain their completed self-certification on file at their facilities which will be checked by NBC PT Staff during the follow-up assessment.
- viii. *Statistical analysis.* The Project Partners will take all data gathered from the initial and follow-up assessments and will perform a detailed analysis. The degree of improvements with Project Baseline Performance levels as they may relate to BMP implementation will be assessed.

## 2. Logic Model

Attachment II contains individual Logic Models developed for each of the two project components:

- Energy Management Systems for WWTFs, and
- FOG Waste Environmental Results Program for restaurants and other members of the Food Service Industry.

Each model takes into account available project resources, shows the connection between project tasks and associated outputs, and identifies both short and long term project outcomes.

### **3. Key Activities and Milestones**

#### **a. Current Situation and Need**

As part of developing this project the Project Partners recognized that:

- Wastewater Treatment Facility (WWTF) operations have high energy demands, energy demands are increasing with the implementation of stricter wastewater effluent criteria, and energy costs are increasing; and
- Waste FOG from restaurants and the Food Service Industry Sector can cause sewer blockage problems and waste management problems for WWTFs and furthermore waste FOG can be better utilized a valuable source of renewable energy.

#### **b. Objectives and Public Benefits**

As discussed above the project has been divided into two distinct components (approaches) that combined will help in achieving the goal of developing and implementing “Sustainable Energy Management Practices for Wastewater Treatment Facilities.” An EMS Plan-Do-Check-Act approach will help with the development of Energy Focused Environmental Management Systems for WWTF and a FOG Management ERP will help address WWTF operations impacts associated with FOG discharges while encouraging the use of collected FOG as a source of renewable energy.

The Plan-Do-Check-Act approach has proven successful for establishing and achieving environmental goals through the ISO 14001 Environmental Management System standards and has been incorporated into EPA’s Energy Star Program for achieving energy goals. By developing and implementing an Energy Management System based on the Plan-Do-Act-Check approach participating WWTFs will be able to identify energy saving opportunities, establish energy management goals and objectives and measure their progress meeting these goals using EPA’s Energy Star Portfolio Manager data-base. More efficient use of energy by WWTFs benefits the public by reducing wastewater treatment operating costs thus stabilizing user rates and fees, reducing the generation of Greenhouse gasses resulting better air quality, and reducing dependency on non-renewable fossil fuels. A schedule for key activities associated with developing and implementing the Energy Management System component of this project is included in Table I – Schedule of Key Tasks and Activities.

The ERP approach will help demonstrate that employee education and heightened awareness combined with facility self-certified audits and NBC inspections (the ERP method) can produce better environmental outcomes than the current regulatory approach. Thus the study

should answer a critical question: can ERP achieve similar compliance rates in a short time frame compared to the traditional regulatory/enforcement program.

The study will compare pre and post project indicators (e.g. number of BMPs implemented, lbs of FOG received at WWTF headworks, lbs of FOG used for energy recover) to determine if better outcomes are achieved through the Environmental Results Program. Public benefits include a more efficient regulatory program and improved environmental quality through reduced FOG discharges.

Baseline data for the proposed study resides in NBC's Pretreatment Program and WWTF Operation files and databases. Using this data, the Project Partners will assess whether an alternative ERP model can be just as or more effective in achieving regulatory compliance as the traditional regulatory/enforcement program, explore the extent to which a link can be made between the use of BMPs and compliance, and compare the cost/benefit of each approach. The data and information produced will then be available to inform state and federal policy making. A schedule for key activities associated with developing and implementing the Waste FOG ERP component of this project is included in Table I – Schedule of Key Tasks and Activities.

**Table I - A Schedule of Key Tasks and Activities Project Objective 1 - EF-EMS**

<b>Number</b>	<b>Task</b>	<b>Task Description</b>	<b>Outputs</b>	<b>Start*</b>	<b>Finish</b>
0	Project QAPP	Develop an overall Quality Assurance Project Plan	<ul style="list-style-type: none"> <li>EPA Approved QAPP</li> </ul>	August 1, 2008	October 1, 2008
1(i)	Steering Committee	Form an EMS Project Steering Committee and hold Committee meetings	<ul style="list-style-type: none"> <li>Member List</li> <li>Meeting Minutes</li> <li>List of Incentives</li> <li>Lessons Learned</li> <li>Final Project Report/Recommendations</li> </ul>	September 1, 2008	On-going
1(ii)	Project Kick-Off Meeting	Develop, organize and hold a kick-off meeting with WWTF and Energy Management System project component stakeholders	<ul style="list-style-type: none"> <li>Workshop Agenda</li> <li>Attendee List</li> <li>Speaker Presentations</li> <li>List of Participating WWTF</li> </ul>	September 1, 2008	December 31, 2008
1(iv)	EF-EMS Energy Guidebook Training	Hold a one day training session on developing an EF-EMS using EPA's Energy Guidebook	<ul style="list-style-type: none"> <li>Curriculum</li> <li>Agenda</li> <li>Attendee List</li> </ul>	January 1, 2009	February 28, 2009
1(v)	Portfolio Manager Workshop	Collect and tabulate energy use and operational performance data from participating WWTFs Compile collected energy use and operational performance data into EPA Energy Star Portfolio	<ul style="list-style-type: none"> <li>WWTF Energy Use Data</li> <li>WWTF Operational Performance Data</li> <li>WWTF Energy Use Baseline</li> </ul>	March 1, 2009	April 30, 2009
1(vi)	EF-EMS Roundtable Meetings	Hold 6 to 12 monthly EF-EMS Roundtable Meetings	<ul style="list-style-type: none"> <li>Working EF-EMS for each participating WWTF</li> </ul>	May 1, 2009	April 30, 2010

<b>Number</b>	<b>Task</b>	<b>Task Description</b>	<b>Outputs</b>	<b>Start*</b>	<b>Finish</b>
1(vii)	Energy Use Assessments	<p>Conduct on-site Energy Use Assessments of each participating WWTF in order to help with:</p> <ul style="list-style-type: none"> <li>Identifying specific high energy demand equipment used at each participating WWTF</li> <li>implementing their Energy Management System</li> <li>Assessing and documenting energy billing procedure use by individual power supply companies</li> <li>Assessing renewable energy opportunities</li> <li>Assessing PDCA cycle at each participating WWTF</li> </ul>	<ul style="list-style-type: none"> <li>Written summaries and progress reports on identified energy projects</li> <li>WWTF Equipment Energy Demand Database</li> </ul>	May 1, 2009	April 30, 2010
1(viii)	Project Assessment	<ul style="list-style-type: none"> <li>Assess project success through review of collected data and, as needed, conducting follow-up site visits of participating WWTFs</li> <li>Assess overall successfulness of the PDCA cycle</li> </ul>	<ul style="list-style-type: none"> <li>Written summaries and progress reports on identified energy projects</li> <li>Final Project Report</li> </ul>	May 1, 2010	September 30, 2011

\*All start dates prior to October 1, 2008 are conditional upon EPA approval.



**Table I - B Schedule of Key Tasks and Activities Project Objective 2 – Waste FOG ERP**

<b>Number</b>	<b>Task</b>	<b>Task Description</b>	<b>Outputs</b>	<b>Start*</b>	<b>Finish</b>
2(i)	ERP Steering Committee	Organize and form a Steering committee that includes ERP project stakeholders	<ul style="list-style-type: none"> <li>Minutes from Steering Committee Meeting</li> </ul>	September 1, 2008	On-Going
2(ii)	Identification of Sector Universe	Identify all “Yellow” Grease end-users doing business in Rhode Island Contact and conduct site visits of “Yellow” Grease end users Develop “Plan of Action” for conducting “Inspections” of NBC permitted restaurants	<ul style="list-style-type: none"> <li>List of all NBC Restaurants</li> <li>List of “Yellow” Grease end-users</li> <li>Field Reports from site visits of “Yellow” Grease end-users</li> </ul>	September 1, 2008	October 31, 2008
2(iii)	Develop ERP Checklist and BMPS	Develop Waste FOG ERP self-certification checklist and BMPs	<ul style="list-style-type: none"> <li>ERP Draft Checklist</li> <li>ERP Draft Manual</li> </ul>	September 1, 2008	November 30, 2008
2(iv)	ERP Checklist Test	Test out checklist at two to three pre-selected facilities	<ul style="list-style-type: none"> <li>ERP Final Checklist</li> <li>ERP Final Manual</li> </ul>	December 1, 2008	December 31, 2008
2(v)	ERP Kick-off Meeting	Develop and hold workshop for restaurants and other stakeholders	<ul style="list-style-type: none"> <li>Workshop attendee list</li> <li>Workshop Agenda</li> <li>Workshop Presentations</li> </ul>	October 1, 2008	November 30, 2008
2(vi)	ERP Assessments	Conduct Initial and Follow-Up FOG Management Assessments of all NBC permitted restaurants Compile Baseline data	<ul style="list-style-type: none"> <li>Completed Checklists</li> <li>Baseline Data</li> </ul>	December 1, 2008	March 31, 2012
2(vii)	ERP Certifications	Check Self-Certifications	<ul style="list-style-type: none"> <li>Signed Self-Certifications</li> </ul>	December 1, 2008	March 31, 2012
2(viii)	Statistical Analysis	Perform statistical analysis on collected data	<ul style="list-style-type: none"> <li>Statistical outcome summary report</li> </ul>	April 2012	September 30, 2012

\*All start dates prior to October 1, 2008 are conditional upon EPA approval.

### c. Compliance with Requirements

This section of the Work Plan describes how the project complies with SIG Program Eligibility Requirements and Selection Criteria:

*Threshold Criterion 1* – The proposed project activities are in alignment with the authority of both the Clean Air Act by minimizing air pollutants associated energy generation and consumption, and the Clean Water Act (CWA) by focusing energy management efforts on WWTF operations that are permitted under the CWA. The proposed project activities involve the collection and dissemination of information and training activities involving efficient energy management practices using 1) commonly employed Plan-Do-Check mechanisms typically reserved and utilized in an environmental model, and 2) the ERP approach for industry sector compliance initiatives. While both the EMS and ERP models have proven to be effective in addressing environmental issues, this project uses a new approach by applying these highly successful methods to establish and implement organized Energy Focused Environmental Management Systems among WWTFs on a statewide basis.

*Threshold Criterion 2* - This project meets the following elements of EPA’s Strategic Plan:

Goal 1: Clean Air and Global Climate Change – The proposed project seeks to reduce the energy demand of participating WWTFs through more efficient energy use and the use of renewable energy sources resulting in the generation of less Greenhouse Gases while accomplishing the same or better level of wastewater treatment.

Goal 2: Clean and Safe Water – The proposed project focuses on WWTF facility operations that by design convert wastewater into clean safe water for discharge to the environment and, in some cases, for reuse.

Goal 4: Healthy Community and Ecosystems – The proposed project outcomes include cleaner air and clean water resulting in healthier communities and healthier ecosystems.

Goal 5: Compliance and Environmental Stewardship – The proposed project avoids the generation of air pollution through the use of efficient energy practices and procedures.

*Threshold Criterion 3* – The project proposal complies with all requirements set forth in Section IV A, B, and D of the State Innovation Grant Request for Proposal FY2008 Announcement.

*Eligibility* - The NBC meets the State Innovation Grant Program eligibility criteria of being a municipal agency with delegated authority for federal environmental permitting through its authority to issue or deny wastewater discharge permits “as required by applicable federal and state law” under Rhode Island General Laws Title 46 Chapter 25 Section 25 and in accordance with NBC’s two Rhode Island Pollution Elimination Discharge (RIPDES) permits RI100315 – Field’s Point and RI0100072 – Bucklin Point.

### d. Environmental Outcomes.

Table II – Project Outcomes and Associated Costs divides the two overall project components, EMS and ERP, each into three distinct phases: 1) Development, 2)

Implementation and 3) Assessment. The Table shows each phase, associated tasks and expected outcomes as identified through the development of the Project Logic Models.

Based on NBC's energy management experience it is anticipated that even the most energy efficient WWTF will benefit from the use of an Energy Management System. NBC was able to realize an 11% increase in energy efficiency by installing higher efficiency equipment as part of a recent upgrade to the Bucklin Point WWTF. Payback periods associated with these improvements ranged from 1.5 to 7.5 years. Assuming older WWTFs participating in this project take advantage of only the less expensive energy conservation options, a 5% overall reduction in energy use should be readily achievable. If a 50% participation rate by all Rhode Island WWTFs is achieved, an average annual energy reduction of 1,037 MWh/year in electrical demand is possible.

Burning of fossil fuels results in air pollution emissions including greenhouse gases: CO<sub>2</sub>, NO<sub>x</sub> and water vapor. Though the mix of fuels used to generate electrical power varies by region, based on the average New England power industry's fuel mix<sup>5</sup>, every 1 MWh of electrical demand taken off the New England grid will result in a reduction of about 844 lbs of CO<sub>2</sub> emissions. Thus a 1,037 MWh/year reduction in electrical demand will result in a reduction of more than 435 tons of CO<sub>2</sub> emissions. To define long term outcomes, the performance of each participating WWTF will be tracked using EPA's Energy Star Portfolio Manager<sup>6</sup> tracking program.

Anticipated project results associated with the ERP approach will need to be determined during an initial "Baseline Performance Assessment" conducted during the development phase of the ERP.

Performance Outcomes with Quantifiable Indicators will be measured through a comparison of measuring post project performance data to baseline performance data and will thus give an assessment of the successfulness of the project approach and methodology. Performance Outcomes with more quality based Indicators such as increased knowledge and/or awareness of a particular issue will be measured using pre-activity and post-activity surveys and/or questionnaires and interaction between the Project Partners and Project Participants. .

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<sup>5</sup> ISO New England <http://www.iso-ne.com>

<sup>6</sup> [http://www.energystar.gov/index.cfm?c=evaluate\\_performance.bus\\_portfoliomanager](http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager)

**Table II - Project Outcomes and Associated Costs**

Project Phase/Major Tasks	Outcomes	Indicators*	Time Frame (Project Quarters)																
Develop ERP Process																			
Form ERP Steering Committee Develop Checklist & BMPS Test Checklist	Improved Awareness of Waste FOG Issues and Concerns	# Restaurants demonstrating improved awareness																	
	Awareness of Waste FOG as a Valuable Resource	# Restaurants diverting FOG from trash to end-user																	
	Understanding of the ERP Process and Benefits of Participation	# Restaurants self certifying																	
Implement ERP Process																			
ERP Kick-Off Meeting Conduct Initial Assessments	Decrease in Quantity of Waste FOG Discharged to Sewer	lbs FOG detected at WWTF head works																	
	Increase in Waste FOG Being Used as a Source of Renewable Energy	lbs of grease used for energy generation																	
	Improved Wastewater Collection and Treatment Operations	# of reported FOG blockage problems																	
Assess ERP Process																			
Conduct Follow-Up Assessment Statistical Analysis Final Report	Stakeholder Participation	# of participants																	
	Project Success and Transferability	# of WWTF adopting ERP																	
	Use of BMPs	# BMPs utilized																	
Develop EF-EMS Process																			
Form Steering EF-EMS Committee Develop Energy Use Baseline Project Kick-Off Meeting Develop Training Program	Improved Awareness of Energy Use Impacts	# WWTFs demonstrating improved awareness																	
	Awareness of Benefits of Energy Management Systems	# WWTFs demonstrating improved awareness																	
	WWTF Awareness of Energy Cost Saving Opportunities	# WWTFs demonstrating improved awareness																	
	WWTF Awareness of Economic and Environmental Benefits of Renewable Energy Opportunities	# WWTFs demonstrating improved awareness																	
Implement EF- EMS Process																			
EMS Training Workshop Roundtable Meetings Conduct Site Visits	Development of Energy Management Systems by Participating WWTFs	# of WWTF with EF-EMSs																	
	Implementation of Energy Management Projects	# of individual projects implemented																	
Assess EMS Process																			
Plan-Do-Check-Act Monitor and Measure Results Final Report	Implementation of Energy Monitoring and Measurement Activities	# of WWTF using the Portfolio Manager																	
	Reduction in energy use by participating WWTFs	MWHs reduced MMBTUs reduced																	

\*All work associated with surveys and/or questioners will be conducted using grant matching funds only

**e. Transferability.**

The Project Partners believe that the approaches and activities used to achieve the desired Performance and Results will be directly transferable to other states both regionally and nationally. The EF-EMS approach utilizing EPA’s Ensuring a Sustainable Future” An Energy Management Guidebook for Wastewater and Water Utilities, will be designed to address the energy concerns of WWTF in general and not just the operations of one or two facilities. By including all Rhode Island WWTFs as potential participants the project will be able to look at and address the energy issues of a variety of different wastewater treatment processes and operations at multiple facilities. The final EF-EMS Project Outcomes, including but not limited to Project Lessons Learned and a Wastewater EF-EMS curriculum will thus be directly transferable for use by other state’s WWTFs. Similarly restaurant FOG issues are a common concern to all WWTF. The BMPs utilized in the ERP aspect of this Project will be applicable to any restaurant that generated FOG waste. While use of FOG for bio-diesel production may be limited areas where there is a Market for bio-diesel, the Project findings associated with using FOG as a supplement feed steam for anaerobic digestion can be transferred to any WWTF using anaerobic digesters.

The final Project Report, Lessons Learned, BMPs, EF-EMS Curriculum along with any other documents, articles and reports will be available to interested parties through NBC, RIDEM, URI and EPA.

**f. Public Involvement.**

Work activities associated with this project will be conducted with the cooperation of a group of stakeholders as part of an EF-EMS Steering Committee and an ERP Steering Committee. Each of these steering committees will meet on a regular basis to keep members informed of Project activities. Additionally all information on Project activities will be posted on NBC and RIDEM web-pages. Also NBC activities are conducted with the full knowledge and consent of NBC’s Board of Commissioners and Citizens Advisory Committee both of which have members that represent the general public.

**VI. Reporting Requirements**

Quarterly Progress Reports including copies of project/task outputs will be submitted as required by EPA. A detailed follow-up case study will be prepared along with a final report at the end of the grant period. Case study reports will include: summary of the project, reductions achieved if applicable, cost analysis, problems, successes, and lessons learned. Progress Reports will be submitted for the following Project Time Periods:

<b>Report</b>	<b>Period Covered</b>
1	09/01/2008 – 12/31/2008
2	01/01/2009 – 03/31/2009
3	04/01/2009 – 06/30/2009
4	07/01/2009 – 09/30/2009
5	10/01/2009 – 12/31/2009
6	01/01/2010 – 03/31/2010

7	04/01/2010 – 06/30/2010
8	07/01/2010 – 09/30/2010
9	10/01/2010 – 12/31/2010
10	01/01/2011 – 03/31/2011
11	04/01/2011 – 06/30/2011
12	07/01/2011 – 09/30/2011
13	10/01/2011 – 12/31/211
14	01/01/2012 – 03/31/2012
15	04/001/2012 – 06/30/2012
16	07/01/2012 – 09/30/2012
Final	09/01/2008 – 09/30/2012

**VII. Total Project Cost.** \$379,760 (includes NBC and URI leveraged matching funds).

**VIII. Detailed Itemized Budget.** Presented in Attachment I.

**IX. Key Personnel.** Attachment III contains short biographies on each of the key project participants and Attachment IV contains a summary of Environmental Results Past Performance and Programmatic Capabilities of the Project Partners.

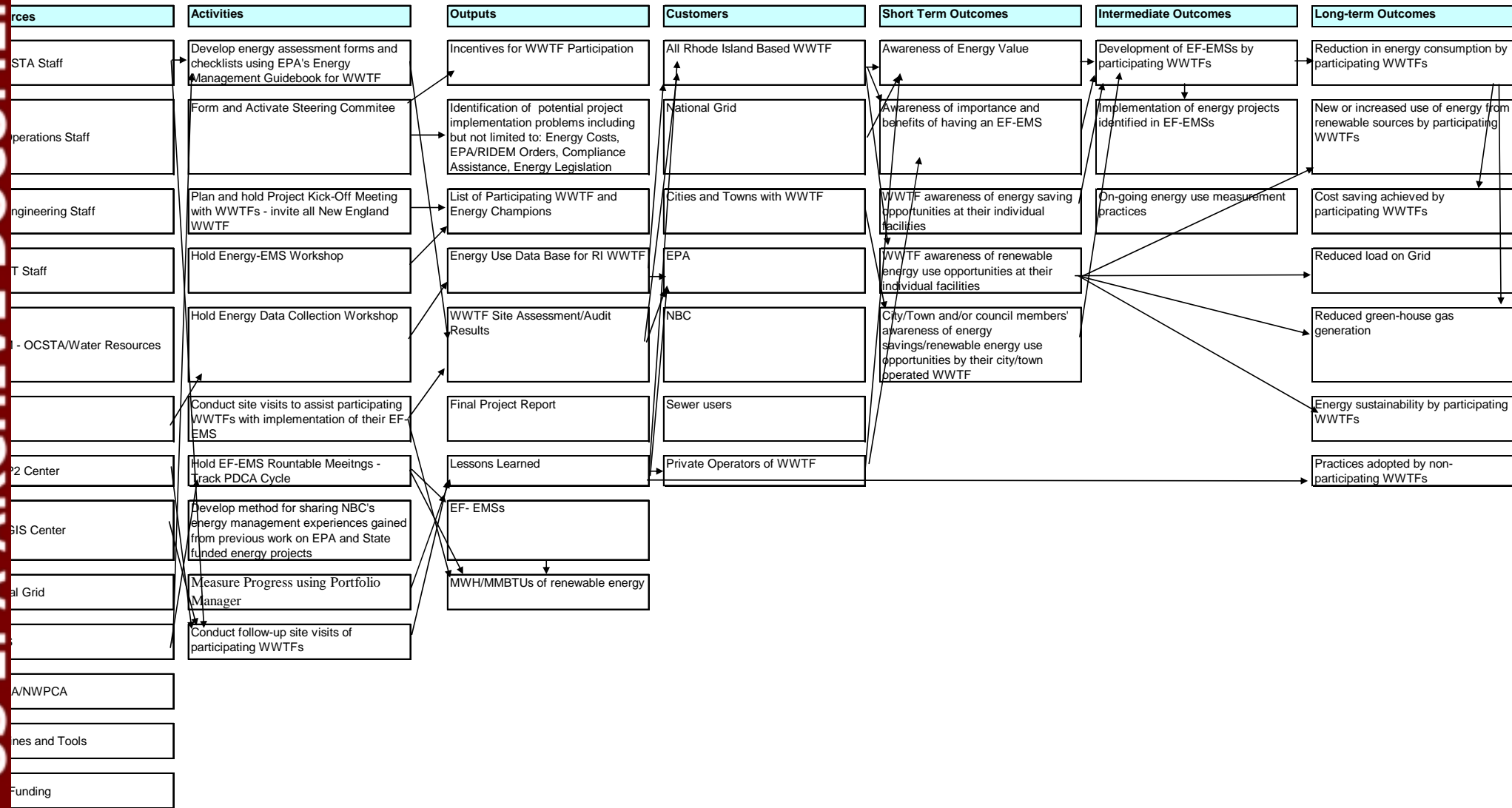


**ATTACHMENT I**  
*Detailed Itemized Budget*

**(Confidential business information removed by EPA)**

## ATTACHMENT II-A Logic Model – WWTf EF-EMS

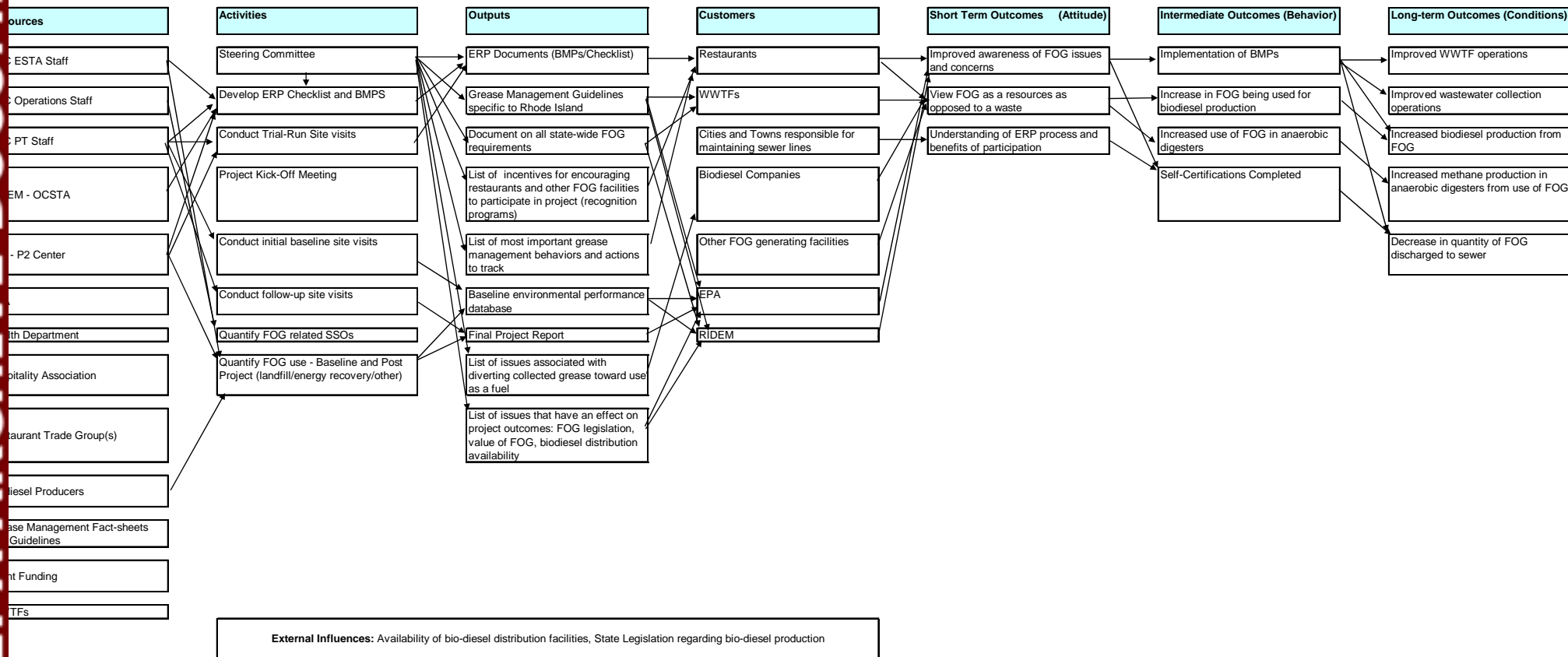
**Mission/Goal: Improve Energy Efficiency and Encourage/Increase use of Renewable Energy by Rhode Island Wastewater Treatment Facilities**



**External Influences:** Available project participation incentives, State Legislation regarding bio-diesel production

## ATTACHMENT II-B Logic Model – Waste FOG ERP

mission: Reduce the Discharge of Waste Oil and Grease to the Sewer System and Promote the Use of Waste Oil and Grease as a Source of Renewable Energy



### ATTACHMENT III *Key Project Personnel*

#### Thomas E. Armstrong

Thomas E. Armstrong is a Principal Environmental Planner with the Rhode Island Department of Environmental Management (RIDEM), Office of Technical & Customer Assistance. He has been involved with the implementation of RIDEM's Auto Body Repair Facilities Certification Program, and planning and design of RIDEM's Exterior Lead Paint Removal Certification Program now being prepared for implementation. His other responsibilities in the office's Pollution Prevention Program include providing pollution prevention information and compliance assistance, assistance related to the Rhode Island Environmental Compliance Assistance Incentive Policy Act, managing the Department's Used Oil & Used Oil Filter Collection & Recycling program, and participation in organizational activities such as NEWMOA's Pollution Prevention Roundtable. Tom previously managed the Department's Household Hazardous Waste Program from 1995 through 2001. He worked on environmental planning and policy issues in the Office of Strategic Planning & Policy from 1996 through 2003. He has been an employee of RIDEM in various capacities since 1976. He received a Bachelor of Science degree in Forestry from the University of New Hampshire in 1975.

#### Richard Enander, PhD

Richard Enander, PhD is a Supervising Scientist and Pollution Prevention Manager with the Rhode Island Department of Environmental Management in Providence. Prior to his 17 years with the Department, Richard worked in environmental compliance for the Specialty Chemicals Group of Hoechst Celanese Corporation, a subsidiary of Hoechst AG, West Germany. His current work includes the delivery of technical and compliance assistance to industry, review of quantitative human health risk assessments, and the design and implementation of sector-wide initiatives for a number of industries. Richard is the author of a book and book chapter (CRC Press/McGraw-Hill) on hazardous waste tracking for generators and has published a number of articles on pollution prevention and human health risks in the peer-reviewed literature. He is on the editorial board of the Journal of Occupational and Environmental Hygiene (an international peer-reviewed journal of the American Industrial Hygiene Association and the American Conference of Governmental Industrial Hygienists). Richard received his PhD in Environmental Health from Tufts University.

#### Ronald Gagnon, PE, MBA

Ronald Gagnon currently serves as the Chief of the Office of Technical and Customer Assistance (OTCA) at the Rhode Island Department of Environmental Management. OTCA is a non-regulatory program that provides permitting assistance and coordination, pollution prevention assistance and small business assistance. Ron is a Professional Engineer with over 20 years of experience that includes both private practice and public sector employment. Previous positions over the last 17 years at DEM include Supervisor of the Solid Waste Program and Chief of the Waste Management Division. Ron received a Bachelor's Degree in Civil Engineering from the University of Notre Dame and a Master's Degree in Business Administration from the University of Rhode Island.

#### Eugene Park, PhD

Eugene Park, PhD is an Associate Research Professor in the Chemical Engineering Department at the University of Rhode Island. He has also been Co-Director of the URI Center for Pollution Prevention since 1993. With undergraduate and Master's degrees from Dartmouth College, Park received his PhD from URI in 1993. Research interests include membrane separation and biological trickling filtration. He has been involved in many new environmental initiatives like ERP for auto body, lead paint removal contractors, and dry cleaners. The URI Center has provided technical assistance to over 400 RI businesses since 1989. Park received the EPA Individual Environment Merit Award in 1998. Since 1997, he has also been involved in international collaboration projects with Korea, Thailand, and Central America.

#### Dave Aucoin

Dave Aucoin is an Environmental Compliance Technical Assistant within the Narragansett Bay Commission's (NBC) Environmental, Safety & Technical Assistance (ESTA) program. After obtaining his B.A. in Marine Affairs from the University of RI in 2002, Dave began his career in wastewater as an Operator at the NBC Field's Point WWTF in Providence, RI, where he obtained an Operator II certification level through the RI DEM. Dave also has Industrial Hygiene experience specifically pertaining to Indoor Air Quality (IAQ), in addition to academic

experience in Geology and Oceanography. He has worked within the ESTA program since March of 2005 and has contributed to many technical assistance activities, the production of project fact sheets for NBC employees and the public, and also the success of an award-winning in-house Environmental Health & Safety Training Program. Dave also tracks NBC's solid waste generation and recycling efforts on a monthly basis and keeps employees involved with respect to emergency preparedness/response procedures and the appropriate handling of Universal Waste. Dave most recently achieved certification as an Environmental Professional Intern (EPI) through the Institute for Professional Environmental Practice (IPEP) out of Duquesne University, PA. He has also served as Secretary for the last 2 ½ years on the Local Emergency Planning Committee #5, encompassing the City of Providence.

James McCaughey, P.E., BCEE

James McCaughey has been the Environmental, Safety and Technical Assistance Program (formerly Pollution Prevention Program) Manager for the Narragansett Bay Commission since 1992. In this role Mr. McCaughey is responsible for administrating NBC's Pollution Prevention Technical Assistance Program, overseeing all aspects of NBC's Environmental Health and Safety Program activities and managing NBC's Renewable Energy Program efforts. Mr. McCaughey has B.S and M.S. degrees in Chemical Engineering, he is a licensed Professional Engineer in the State of Rhode Island and he is board certified in Hazardous Waste Management by the American Academy of Environmental Engineers

James Brum

James Brum, Project Manager at RIMES, has worked as a Facilities manager for several Rhode Island manufacturing companies over the past 37 years. Among his accomplishments are the development of a "safety one" program that helped reduce workman's comp insurance by \$80,000, and the implementation of various environmental regulatory compliance programs—one of which included a soil remediation project that resulted in a no further action required. Jim's core responsibilities have included machine reliability studies (which have increased uptime 30-50% by using preventative, predictive and total productive maintenance methods) and leading problem solving teams to help reduce maintenance costs. Jim is an experienced facilitator who led a work improvement team to national quality competition. As an instructor of lean manufacturing and problem solving skills at major Rhode Island companies, Jim has been involved with quality systems as an ISO 9001 auditor and has brought one company into ISO 14001 compliance. Jim has also helped develop sustainability and green manufacturing programs and has led many projects that resulted in hundreds of thousands of dollars in savings with less than a 2 yr payback. He is a magna cum laude graduate in mechanical engineering from Roger Williams College.

John Gilheeny

John Gilheeny, Project Manager at RIMES, has over 35 years of experience working with various organizations throughout North America and has helped them to improve operations, productivity, quality, customer service and environmental, health and safety performance. He has 8 years experience working for DNV (Det Norske Veritas) Certification, Inc. as a Senior Lead Assessor auditing quality, environmental, health, safety and security management systems against the ISO 9001, ISO 14001, OHSAS 18001, National Bio-solids Partnership (U.S. Environmental Protection Agency) and Responsible Care® Standards and Technical Specifications (Chemical Manufacturers Association). Some of the organizations John has worked with include: Toyota, General Motors, Rohm and Haas, Alcoa, NASA, General Dynamics, Tyco Electronics, BP, Marathon Oil Company, Lucent Technologies, Caterpillar, City of Fort Worth and Rhode Island School of Design. In addition, John has 24 years of experience with Hoechst North America in Coventry, RI as an Operations Manager, Quality/Senior HR Representative, Quality/SPC Coordinator, Quality Team Facilitator and Operator. John has a BA in Labor Studies from Rhode Island College and an MS in Total Quality Management from Anna Maria College, MA. He is Past President of the Rhode Island Chapter of the Association for Quality and Participation, and a co-founder of the Rhode Island ISO 9000 and ISO 14000 Roundtables.

Stanley M. Barnett, Ph.D.

Stanley M. Barnett, Ph.D., is a Professor of Chemical Engineering and Director of the Center for Pollution Prevention. Barnett founded the Center in 1989 with support from the Rhode Island Department of Environmental Management. He holds undergraduate degrees from Columbia University and graduate degrees from Lehigh and University of Pennsylvania. The URI Center for Pollution Prevention has worked closely with US EPA, DEM, and over 300 RI businesses to find cost-effective solutions to a wide range of environmental problems. Faculty and students collaborate with government and industry to reduce waste and improve economic competitiveness. While

based out of the Chemical Engineering Department, the Center utilizes an interdisciplinary approach when investigating industry-related environmental issues; past projects have included working with the departments of Textiles, Mechanical/Manufacturing Engineering, Chemistry, Food Science and the Business School. With a long track of separations research, Barnett has been involved in many projects to solve a wide array of environmental problems. Barnett has also expanded his activities and research focus areas to include important energy topics. He sits on URI President's Council of Sustainability and is heading up a research project to compare emissions from diesel fuel with emissions from bio-diesel fuel. In addition, an ongoing research interest is the development of bio-diesel fuel cells. Under his direction, the Center has received awards from RI Save the Bay and U.S. Senator Lincoln Chafee.



**ATTACHMENT IV**  
***Environmental Results Past Performance and***  
**Programmatic Capabilities**

The following is a list of federally funded grant projects/programs performed by the various project partners (NBC, RIDEM and URI):

Project	Lead Agency	EPA Support	Results
Auto Body Sector Environmental Results Program	RIDEM with URI	No	Training for approximately 20% of the regulated universe; 50% participation rate with the voluntary program; Significant reductions in exposure to auto sanding dust and methylene chloride; statistically significant improved compliance with 24 EBPIs; a paper authored by OTCA staff has been accepted for publication in the <i>American Journal for Public Health</i> .
Underground Storage Tank Environmental Results Program	RIDEM with URI	Yes – approximately \$70,000 in Contractor Services provided by EPA Region 1	Conducted 6 training sessions with approximately 125 facilities represented (approximately 18% of regulated universe); 91% participation rate with mandatory program; average 74% baseline compliance with 16 selected EBPIs; developed and implementing mobile inspection program using Tablet PCs; Computation of statistically significant improvement rates underway
Lead Paint Removal Contractor Environmental Results Program	RIDEM with URI	Yes - \$35,000 Grant from EPA Region 1	Developed industry work book and check list; Issued 44 Certificates of Participation, Posted informative web site; planning inspection program to measure compliance
Amalgam Separator Environmental Results Program	RIDEM with NBC	No	Developed electronic check list with Program Partner (Narragansett Bay Commission) <a href="http://RI.gov: Survey: Survey #47: DEM Dental Amalgam Mercury Recycling Certification Form">RI.gov: Survey: Survey #47: DEM Dental Amalgam Mercury Recycling Certification Form</a> ; program is underway with approximately 30% of dental facilities participating at this time.
Auto Salvage Sector Environmental Results Program	RIDEM with NBC and URI	Yes -\$200,000 EPA State Innovations Grant	Developed industry work book and check list, completed 30 random baseline, inspections, stakeholder meetings being scheduled
States Common Measures Project	RIDEM	Yes - \$250,000 EPA State Innovations Grant	RI is a full participating state, completed training on statistical analysis using CADMUS tools, selecting sectors and EBPIs.
Stormwater Management Pollution Prevention	NBC	\$35,000 PPIS Grant	Developed stormwater pollution prevention checklist, conducted more than 35 industrial stormwater management assessments, and organized and sponsored two stormwater management workshops.
Renewable Energy Opportunities for POTWs	NBC	\$25,000 PPIS Grant – project is ongoing	Conducted energy use assessments of all NBC facilities, and initiated two renewable energy projects. NBC is currently planning workshop on renewable energy opportunities for regional POTWs for the Summer of 2008.
MS4 Construction Site Runoff ERP	RIDEM with URI	Yes -\$200,000 EPA State Innovations Grant	New project to develop a self-certification program using ERP tools for the use of BMPs to control erosion and sedimentation from construction sites greater than one acre.

## **Programmatic Capabilities**

### Underground Storage Tanks Environmental Results Program

EPA Support: approximately \$70,000 in contractor assistance

DEM was technically able to successfully manage and carry out the agreement by:

- ✓ Convening a stake holder process with industry representatives to develop a work book based on the federal model and a check list. The check list was substantially organized by the industry stake holder group to meet their needs.
- ✓ Implement a training program with the assistance of the EPA contractor. DEM and the contractor held six training sessions over a two month period at various locations in Rhode Island.
- ✓ Conduct random and targeted inspections to establish base line conditions and ensure program compliance.
- ✓ Develop and implement a statistical analysis of check list questions to measure compliance.

DEM met the reporting requirements for this project by producing the work book and check list on time, conducting the stake holder meetings, and implementing the program in a timely manner. Rhode Island is the first state to use ERP in the UST sector.

### Auto Salvage Yard Environmental Results Program

EPA Support: \$200,000 State Innovation Grant

DEM continues to be technically able to successfully manage and carry out the agreement by:

- ✓ Developing a multi-media work book and check list for compliance with Air, Water and Waste compliance requirements.
- ✓ Conducting more than 30 base line inspections
- ✓ Beginning the stake holder process – the first meeting will be held on January 25, 2007.

DEM is meeting the reporting requirements for this project through the submission of timely quarterly reports. This project is on schedule and has met or exceeded all grant commitments.

### Underground Storage Tanks – Alternative Inspection Programs and the U.S. Energy Policy Act of 2005

EPA Support: \$250,000 State Innovation Grant

The project period began on January 1, 2007. A kick off meeting was held with project partners on January 5, 2007.

URI and NBC have both completed a number of EPA PPIS grant projects.