

**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS  
PUBLIC UTILITIES COMMISSION**

**NARRAGANSETT BAY COMMISSION:**

**DOCKET NO. 4602**

**THE NARRAGANSETT BAY COMMISSION'S RESPONSE TO THE  
RHODE ISLAND PUBLIC UTILITIES COMMISSION'S  
FIRST SET OF DATA REQUESTS**

COMM-1-1 Referring to WEE-4 in the initial filing please explain in detail the Green House Gas Study and the status of such study.

RESPONSE: NBC, like many other wastewater treatment facilities throughout the US, is concerned with both the environmental impacts of greenhouse gas (GHG) emissions from its wastewater treatment operations and the future implementation of costly federal and state regulations regarding GHG emissions and Global Warming. NBC's Greenhouse Gas Study is being undertaken to help NBC better understand its overall carbon footprint, reduce GHG emissions where feasible, and avoid costly future regulatory impacts.

NBC's Greenhouse Gas Study is being conducted proactively in collaboration with the University of Rhode Island (URI) to measure and quantify GHG emissions from NBC's wastewater treatment process operations. The three GHGs being investigated are: carbon dioxide, methane, and nitrous oxide – all by-products of the biological oxidation/reduction of the organic matter and nitrogen compounds present in raw wastewater. The results of this study will allow NBC to identify and quantify sources of these GHGs and identify methods of reducing these emissions.

The study is being conducted in three interrelated phases. The first phase conducted between June 2014 through June 2015 focused on developing the methodologies for collecting and analyzing GHG emission data. During this time URI conducted GHG emission measurements twice per month by connecting a floating gas collection chamber to a spectrometer that measures the accumulated concentration of the three GHGs within the chamber. A typical GHG measurement event would start at about 9:00 AM and conclude around 4:00 PM. This is the first such study, to NBC and URI's knowledge that is measuring real time GHG emissions from wastewater treatment operations over multiple operating seasons.

Preliminary results have shown that GHG emissions from Field's Point treatment tanks vary significantly based on the season and wastewater loadings and that a significant portion of the Field's Point WWTF's overall carbon footprint can be attributed to the emissions from these treatment tanks. In the second phase of the study NBC will begin conducting GHG emission measurements of other wastewater treatment operations

including primary and final clarifiers at both Field's Point and testing treatment tanks at Bucklin Point. Phase two will start in the summer months of 2016 and should conclude by the spring of 2017. The third phase of the study, to be conducted concurrently with the second phase will take place at URI and consist of operating a laboratory model of the Field's Point treatment system. Here URI will vary wastewater treatment operating parameters under controlled conditions and study the effect on GHG generation and emission rates. Activities associated with phase three may take two years to complete.

By identifying and quantifying GHG emissions NBC will be better prepared to address future regulatory requirements in an efficient and cost effective manner ultimately minimizing costs to rate payers.

Prepared by: James McCaughey, P.E.

COMM-1-2 In WEE-4 there are two project numbers for Wind Turbine Construction, 12000D and 12100C. Please describe these projects and explain why they are not also listed in NBC's Capital Project Compliance Reporting in Tab 8 of the filing.

RESPONSE: This question prompted a review of schedule WEE-4 and it appears that the restricted activity from 4/1/15-6/30/15 provided by NBC had some errors. A corrected schedule WEE-4 is attached to my response. The correct project title for project 12000D is the design of the BPWWTF Biogas Reuse Project.

Projects that are essentially complete (retainage, staff time, etc. only remaining) are not included in the Compliance Report. Accordingly, NBC included the construction phase of 12000C – BPWWTF Biogas Reuse Construction and not 12000D as design was essentially complete by 12/31/15. Similarly, 12100C - Wind Turbine Construction is not included in Tab 8 because it was completed. The projects are described as follows:

### **Field's Point Wind Turbines**

In October 2012, the Commission began operation of three 1.5 MW wind turbines that convert wind energy into electricity. The wind turbines will generate clean sustainable energy both for use on-site for wastewater treatment operations and sale back to the grid. In addition to reducing greenhouse gas emissions, the wind turbines offset utility use at the facilities. To date, the turbines have generated over 14 million kWh of clean renewable energy and omitted 4,600 tons of carbon dioxide.

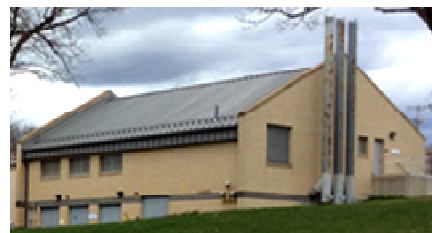


*Photo: Field's Point Wind Turbines*

### **Bucklin Point Biogas Reuse**

At Bucklin Point, NBC uses a process called anaerobic digestion to treat and stabilize biosolids from the wastewater treatment process. The biosolids are placed in large heated digester tanks and biologically decompose in the absence of oxygen, generating a methane rich biogas byproduct. NBC currently uses about 50% of this biogas in an on-site heat exchanger to supply heat to the anaerobic digestion tanks, while the remaining biogas is flared as waste.

NBC will install a combined heat and power system and burn all the biogas in a reciprocating engine to generate approximately 4.5 million kWh of electricity and heat for reuse in the treatment facility. This process will reduce NBC's dependency on fossil fuel generated electricity and reduce NBC's carbon footprint through the efficient use of this readily available renewable fuel. The estimated construction cost for the Biogas Reuse Project (120) is \$8.1 million. This project has qualified for \$512 thousand in "principal loan forgiveness", administered through the RICWFA.



*Photo: Bucklin Point Digester building*

Prepared By: Walter Edge and Thomas Brueckner

**Narragansett Bay Commission**  
**Detail of Capital Project Expenses Disbursed From**  
**Restricted Account**

CORRECTED WEE-4

Restricted Activity 4/1/15-6/30/15			Restricted Activity 7/1/15-12/31/15		
Project Number	Project Name	Amount	Project Number	Project Name	Amount
10901C	FPWWTF NITROGEN REMOVAL CONST.	9,089	10901C	FPWWTF NITROGEN REMOVAL CONST.	82,491
10907C	FP - BLOWER IMPROVEMENTS	423,812	10907C	FP - BLOWER IMPROVEMENTS	1,419,982
10908D	FPWWTF BLOWER IMPROV. PHASE II - D	7,796	10908D	FPWWTF BLOWER IMPROV. PHASE II - D	97,110
1140100	RIVER MODEL DEVELOPMENT	227	1100000	SITE SPECIFIC STUDY	35,570
1140300	GREEN HOUSE GAS STUDY	4,300	1140100	RIVER MODEL DEVELOPMENT	31,765
11602D	FPWWTF - TUNNEL PUMP STATION IMPROV - D	10,604	1140300	GREEN HOUSE GAS STUDY	7,024
12000D	BP WWTF - BIOGAS REUSE - D	340	1140400	EVALUATION OF NBC FACILITIES FOR CLIMATE RESILIENCY	2,335
12000C	BP WWTF - BIOGAS REUSE	69,452	11602D	FPWWTF - TUNNEL PUMP STATION IMPROV - D	3,528
12100C	FP WWTF WIND TURBINE PROJECT CONSTRUCTION	103,686	11602C	FPWWTF - TUNNEL PUMP STATION IMPROV. - C	478
12400D	NEW IM FACILITIES -DESIGN	132	12000D	BP WWTF - BIOGAS REUSE - D	170
12700D	FP ELECTRICAL SUBSTATION - DESIGN	77	12000C	BP WWTF - BIOGAS REUSE	11,242
12700C	FP WWTF ELECTRICAL SUBSTATION NO. 1	14,658	12100C	FP WWTF WIND TURBINE PROJECT CONSTRUCTION	2,500
12900P	FP WWTF OP AND LAB BLDG REUSE	1,482	12500C	UTILITY RELIABILITY IMPROVEMENT AT FP	73,149
30301D	PHASE II CSO FACILITIES-DESIGN	356,669	12600C	FPWWTF LAND ACQUISITION/SITE DEMO	26,630
30303C	PHASE II CSO WCSOI MAIN	51,577	12700D	FP ELECR SUBSTATION - DESIGN	264
30307C	PHASE II CSO FACILITIES - OF 037 SOUTH	26,240	12700C	FP WWTF ELECTICAL SUBSTATION NO. 1	108,327
30310C	Phase II CSO WCSOI NORTH	85,237	12900P	FP WWTF OP AND LAB BLDG REUSE	1,127
30311C	Phase II CSO WCSOI WEST	61,626	13000D	FP WWTF FINAL CLARIFIER IMPROV. - D	17,589
30312C	Phase II CSO SCSOI REGULATOR	14,213	13000C	FP WWTF FINAL CLARIFIER IMPROV. - C	2,813
30444D	MOSHASSUCK VALLEY INT. DESIGN	7,007	30221D	HYDRAULIC SYSTEMS MODELING - DESIGN	138
30455C	IMPROV TO INTERCEPTORS	328	30301D	PHASE II CSO FACILITIES-DESIGN	30,658
30456C	BUTLER HOSPITAL INTERCEPTOR LINING	2,063	30303C	PHASE II CSO WCSOI MAIN	8,000
30457P	PROVIDENCE RIVER SIPHON REHAB - P	28,209	30304C	PHASE II CSO SCSOI MAIN	7,324
30458P	DOUGLAS/BRANCH AVE. INT. RELIEF - P	971	30305C	PHASE II CSO OF 027	205,410
30459C	IMPROV. TO INTERCEPTORS FY 2015	25,732	30438D	INTERCEPTOR EASEMENTS - DESIGN	37,674
30471M	78" INTERCEPTOR OFF ALLENS AVE.	4,202	30444D	MOSHASSUCK VALLEY INT. DESIGN	34,415
30472M	PROVIDENCE AND LINCOLN IIC	8,079	30456C	BUTLER HOSPITAL INTERCEPTOR LINING	355
30501D	INTERCEPTOR EASEMENTS - NBC BVI	1,245	30457P	PROVIDENCE RIVER SIPHON REHAB - P	47,595
30600D	FLOATABLES CONTROL FACILITIES - DESIGN	1,550	30457D	PROV RIVER SIPHON REHAB	24,268
30600C	FLOATABLES CONTROL FACILITIES	59,112	30458P	DOUGLAS/BRANCH AVE. INT. RELIEF - P	4,237
70800C	OMEGA PUMP STATION IMPROVEMENT - CONSTRUCTION	255	30459C	IMPROV. TO INTERCEPTORS FY 2015	50,346
80900D	BPWWTF NITROGEN REMOVAL DESIGN	501	30470M	NORTH PROVIDENCE INT. INSP.	1,102
81000P	BPWWTF UV DISINFECTION IMPROVEMENT	12,542	30471M	78" INTERCEPTOR OFF ALLENS AVE.	3,072
81100C	BPWWTF EFFLUENT PUMPS REHAB.	163,785	30472M	PROVIDENCE AND LINCOLN IIC	144,007
		1,556,796	30473M	LOCKBRIDGE EASEMENT & VALLEY ST. CLEANING & INSP.	1,826
	Balance per schedule WEE-3	(1,556,796)	30501D	INTERCEPTOR EASEMENTS - NBC BVI	3,832
	Variance	\$ (0)	30600D	FLOATABLES CONTROL FACILITIES - DESIGN	101
			30600C	FLOATABLES CONTROL FACILITIES	102,860
			70800P	OMEGA PUMP STATION IMPROVEMENT - P	1,250
			70800C	OMEGA PUMP STATION IMPROVEMENT - C	25,188
			80900D	BPWWTF NITROGEN REMOVAL DESIGN	879
			80900C	BPWWTF NITROGEN REMOVAL CONST.	1,500
			81000P	BPWWTF UV DISINFECTION IMPROV.	8,992
			81300C	BPWWTF FLOOD PROTECTION	6,422
					2,675,547
				Balance per schedule WEE-3	(2,675,547)
				Variance	\$ (0)

COMM-1-3 What is a site specific study identified by project number 1100000?

RESPONSE: The current NBC Rhode Island Pollution Discharge Elimination System (RIPDES) Permits for Field's Point and Bucklin Point specify discharge limits for toxic pollutants such as heavy metals and cyanide. These limits are imposed to enable the receiving waters to meet federal water quality standards for these parameters. The existing discharges from the NBC treatment plants are not able to comply with all the low level permit limits for some pollutants, so the Rhode Island Department of Environmental Management (RIDEM or DEM) issued interim limits as part of a Consent Agreement entered between the NBC and DEM. The interim limits are not as low, so the treatment plants are able to be in compliance with these standards. Bucklin Point has interim limits for Total Copper, Total Mercury, Total Nickel, Total Silver, Total Zinc, and Available Cyanide, and Field's Point has interim limits for Total Copper and Available Cyanide. Each of these interim limits is specified in Consent Agreement RIA-330. However, DEM may require compliance with the lower water quality standards at any time.

RIDEM is currently preparing to reissue revised RIPDES permits which may require NBC to meet these strict water quality standards and NBC has only two options available to achieve compliance. Since the sanitary treatment facilities are not designed to remove these toxic pollutants, the first option is to require businesses to remove them prior to discharge into the NBC sewer system. This would require the NBC to lower the existing metals and cyanide discharge limits imposed on businesses but businesses may not be able to afford to comply and/or there may not be technology that would enable dischargers to actually achieve compliance. In addition, this option may not assure NBC compliance with the much lower RIPDES permit limits which are based on water quality standards.

The second option is to perform a Site Specific Study of the NBC receiving waters and use the data to establish less stringent permit toxic pollutant standards in the NBC RIPDES permits. A site specific study is used to develop numeric criteria based on local data that reflects the natural background conditions or properties of the water body or effluent. In certain cases, the properties of the receiving waters or effluent can cause the pollutant to be less bioavailable or less toxic, resulting in higher permit limits which still protect the health of the water body. Another way of calculating site specific criteria is to base the criteria on the specific resident species found in the receiving waters, unlike national standards which are based on the most sensitive of species. There are few methods for developing site specific criteria that are approved by the EPA, but all must be scientifically defensible and reproducible. The site specific study is the only way to get the discharge limits relaxed, allowing NBC to achieve compliance with these parameters without financially burdening businesses. This study may also be mandated by RIDEM as an element of a Metals Compliance Plan or specified by the RIPDES Permits. Therefore it is prudent, forward thinking and critical that the NBC plan for this project so that it will be ready to proceed should RIDEM require compliance with these strict limits.

Prepared by: Thomas Uva

COMM-1-4 Describe the River Model Development, project number 1140100.

RESPONSE: The existing RIPDES permits required NBC to expend nearly \$100 million to upgrade the two wastewater treatment facilities to meet seasonal total nitrogen discharge limits of 5 mg/L. DEM has taken a phased nitrogen reduction approach in its regulation of wastewater treatment plants and has indicated that additional nitrogen reductions to 3 mg/L may be necessary to achieve water quality standards for Dissolved Oxygen (DO). NBC estimates that the additional facility upgrades necessary to meet possible lower nitrogen limits could cost an additional \$100 million.

NBC strongly objects to the expenditure of additional funds to further reduce nitrogen loadings and does not believe that it will result in water quality standards for DO being achieved. To protect NBC ratepayers from unnecessarily mandated capital expenditures, the NBC has proactively undertaken the NBC River Model Development project to provide the scientific justification necessary to demonstrate if the capital project is truly necessary and will result in water quality improvement. The sound science developed from this project is expected to support an NBC legal challenge, if necessary, to future DEM mandates.

This project consists of a sophisticated computer model called the Regional Ocean Modeling System (ROMS) which was modified from the public domain ROMS model for use in Narragansett Bay by Dr. Kincaid and his students at the University of Rhode Island-Graduate School of Oceanography. This NBC ROMS model can predict the path of flow of water currents and pollutants throughout Narragansett Bay. The Narragansett Bay ROMS is calibrated with an unequaled amount of data and has the ability to track nutrients and other pollutants being discharged from various sources in the Bay and determine where the pollutants end up or accumulate. The project has focused on the effect of nutrient discharges on water quality, specifically nitrogen, but it can be used to model other pollutants. Ongoing and future work includes adding the modeling of biological uptake of nutrients, which can better predict future changes in DO levels.

Using this model, the NBC can evaluate the effect proposed facility upgrades will have on water quality, enabling NBC to challenge costly permit requirements that may not yield water quality improvements. Additional information regarding this project is provided on the NBC website at

<http://snapshot.narrabay.com/app/LearnMore/ModelingProject>

Prepared by: Thomas Uva

COMM-1-5 Please describe the New IM Facilities Design and Construction, project numbers, 12400D and 12400C.

RESPONSE: Legislation was introduced in the General Assembly in the 2012 legislative session that would require NBC to evaluate the feasibility of taking ownership of sewers currently owned and maintained by communities within the district. This legislation did not pass but may be reintroduced in this legislative session. This project consists of preparing the feasibility study and, if feasible, the design and construction of a new building to house the additional equipment and staff needed to maintain the additional sewers.

Prepared by: Thomas Brueckner

COMM-1-6 Please explain why some of the projects listed in WEE-4 are not also listed in the Capital Project Compliance Reporting in Tab 8 of the filing.

RESPONSE: See response to COMM-1-2.

Prepared by: Walter Edge

COMM-1-7 On page 6 of Mr. Brueckner testimony, he states that “NBC is also exploring a net metering wind energy project and has other studies programmed related to anticipated regulatory requirements.” Please describe the wind energy project and detail the other studies NBC is currently engaged in.

RESPONSE: The NBC has benefitted from renewable energy with the operation of three 1.5 MW wind turbines at the Field’s Point Wastewater Treatment Facility in Providence. Utilizing local sources of renewable energy can help stabilize power costs, lessen NBC’s carbon foot print, and reduce the dependency on fossil fuels. Also, as part of Executive Order 15-17 Rhode Island Governor Raimondo has directed state agencies, among other objectives, to: cut their energy consumption by at least 10% from fiscal year 2014 levels by 2019 and procure 100% of their electrical energy from renewable resources by 2025. For these reasons, NBC’s Board of Commissioners has supported staff efforts to evaluate obtaining all of NBC’s power from local renewable resources in the near future.

Large renewable energy systems such as wind farms and solar farms require large footprints of land which are not available at any of NBC’s existing facilities. In order to secure additional renewable energy resources, NBC initiated an exploration of off-site generation utilizing Rhode Island’s new net metering legislation. Specifically, Rhode Island General Law (RIGL) 39-26.4 addresses allowable net metering of renewable energy in the State of Rhode Island and allows a “public entity”, defined by RIGL 39-26.4 (12), to net meter from remote renewable energy resources. In August 2015, NBC issued a Request for Qualifications and Proposals (RFQP) from qualified firms to develop large (1 MW-5 MW) renewable energy generating system(s) that will, in accordance with the public entity net metering financing arrangements defined in RIGL 39-26.4 (7), net meter to existing NBC electric accounts. On the submittal due date of September 17, 2015 four proposals were received and a summary of the proposals is shown in the following table:

Project Type	Nameplate kW	Production kWh/yr
Solar	4,968	8,213,894
Solar	1,994	3,841,730
Solar	10,000	18,212,040
Wind	4,500	9,289,980

At their November 10, 2015 meeting, NBC’s Board of Commissioners voted to further investigate the 10,000 kW Solar Energy and the 4,500 Wind Energy proposals. Discussions are ongoing with these two firms with key factors NBC is addressing before moving forward on either of these projects include evaluating project cost on a \$/kWh basis. The project must be able to supply electricity to NBC at cost less than that available from fossil fuel derived energy and the project must be supply energy in an efficient and reliable manner in compliance with all Rhode Island net metering requirements.

Maximizing use of available renewable energy resources through net metering opportunities is both environmentally beneficial and cost effective. Although fossil fuel costs have dropped recently, this pricing is likely to be temporary and other costs associated with using these fuels may actually increase. For example, in January 2016, the Energize RI Coalition submitted a bill to create a Clean Energy and Jobs Fund that would be financed through a fee of \$15 per ton of carbon sold in the State of Rhode Island. Also noteworthy is a federal carbon tax bill introduced by Rhode Island Senator Whitehouse.

Prepared by: James McCaughey, P.E.

## CERTIFICATION

I hereby certify that on March 16, 2016, I sent a copy of the within to all parties set forth on the attached Service List by electronic mail and copies to Luly Massaro, Commission Clerk, by electronic mail and regular mail.

Parties/Address	E-mail Distribution	Phone
Joseph A. Keough, Jr., Esq. Keough & Sweeney 41 Mendon Ave. Pawtucket, RI 02861	<a href="mailto:jkeoughjr@keoughsweeney.com">jkeoughjr@keoughsweeney.com</a> ;	401-724-3600
Karen L. Giebink, Director of A&F Narragansett Bay Commission One Service Road Providence, RI 02905	<a href="mailto:Kgiebink@narrabay.com">Kgiebink@narrabay.com</a> ;	401-461-8848
	<a href="mailto:gdegnan@narrabay.com">gdegnan@narrabay.com</a> ;	
	<a href="mailto:Sherri.arnold@narrabay.com">Sherri.arnold@narrabay.com</a> ;	
	<a href="mailto:wedge@beconsulting.biz">wedge@beconsulting.biz</a> ;	
Christy Hetherington, Esq. Dept. of Attorney General 150 South Main St. Providence, RI 02903	<a href="mailto:chetherington@riag.ri.gov">chetherington@riag.ri.gov</a> ;	401-222-2424
	<a href="mailto:Steve.scialabba@dpuc.ri.gov">Steve.scialabba@dpuc.ri.gov</a> ;	
	<a href="mailto:dmacrae@riag.ri.gov">dmacrae@riag.ri.gov</a> ;	
	<a href="mailto:jmunoz@riag.ri.gov">jmunoz@riag.ri.gov</a> ;	
	<a href="mailto:pat.smith@dpuc.ri.gov">pat.smith@dpuc.ri.gov</a> ;	
	<a href="mailto:al.mancini@dpuc.ri.gov">al.mancini@dpuc.ri.gov</a> ;	
Thomas S. Catlin Exeter Associates, Inc. 10480 Little Patuxent Parkway Suite 300 Columbia, MD 21044	<a href="mailto:tcatlin@exeterassociates.com">tcatlin@exeterassociates.com</a> ;	410-992-7500
File original and 9 copies w/: Luly E. Massaro, Commission Clerk Public Utilities Commission 89 Jefferson Blvd. Warwick, RI 02888	<a href="mailto:Luly.massaro@puc.ri.gov">Luly.massaro@puc.ri.gov</a> ;	401-780-2107
	<a href="mailto:Patricia.lucarelli@puc.ri.gov">Patricia.lucarelli@puc.ri.gov</a> ;	
	<a href="mailto:Sharon.ColbyCamara@puc.ri.gov">Sharon.ColbyCamara@puc.ri.gov</a> ;	




---

Joseph A. Keough, Jr., Esquire # 4925  
KEOUGH & SWEENEY, LTD.  
41 Mendon Avenue  
Pawtucket, RI 02861  
(401) 724-3600 (phone)  
(401) 724-9909 (fax)  
[jkeoughjr@keoughsweeney.com](mailto:jkeoughjr@keoughsweeney.com)