PRETREATMENT PROGRAM

ANNUAL REPORT

JANUARY 1, 2016 – DECEMBER 31, 2016

The Narragansett Bay Commission

FIELD'S POINT AND BUCKLIN POINT DISTRICTS

MARCH 15, 2017

The Narragansett Bay Commission
One Service Road
Providence, Rhode Island 02905

401 • 461 • 8848
401 • 461 • 6540 FAX
TTY (RI RELAY OPERATOR) 711

http://www.narrabay.com

Vincent J. Mesolella
Chairman

Raymond J. Marshall, P.E.
Executive Director

March 15, 2017

Dear Friends:

I am pleased to present the 2016 Narragansett Bay Commission (NBC) Pretreatment Program Annual Report for the period from January 1, 2016 through December 31, 2016. This annual report is a detailed summary of the many accomplishments associated with the NBC source reduction and control programs utilized in the two sewage districts.

The educational and regulatory source reduction and control programs of the NBC Pretreatment and Environmental Safety & Technical Assistance Sections, coupled with the monitoring, analytical and enforcement work done by the Environmental Monitoring & Data Analysis, Laboratory, and Legal Sections, have been instrumental at ensuring that toxics are not discharged into the NBC sewer system. The NBC is committed to protecting Rhode Island's greatest resource, Narragansett Bay.

Since the NBC acquired the Field's Point Wastewater Treatment Facility in 1981, the total metal loadings to the Field's Point facility have been reduced by 929,694 pounds, which equates to 97.4%. In addition, the cyanide loadings were reduced by 79,308 pounds, a 98.6% reduction from 1981 levels.

The NBC takes its responsibility to protect the receiving waters of Narragansett Bay very seriously. During 2016, the NBC issued 1,878 Notice of Violation letters and two Administrative Orders against violators assessing $26,000 in administrative penalties for various violations of the NBC Rules and Regulations. Funds collected are deposited in the Environmental Enforcement Fund and used to further protect the environment.

The NBC continues to be a national leader in the field of wastewater treatment and environmental protection. The outstanding work done by the NBC staff members in environmental education, enforcement, monitoring and analysis will ensure a cleaner Narragansett Bay for all to enjoy. I trust you will find this report to be thoroughly detailed and informative.

Sincerely,

Raymond J. Marshall, P.E.
Executive Director

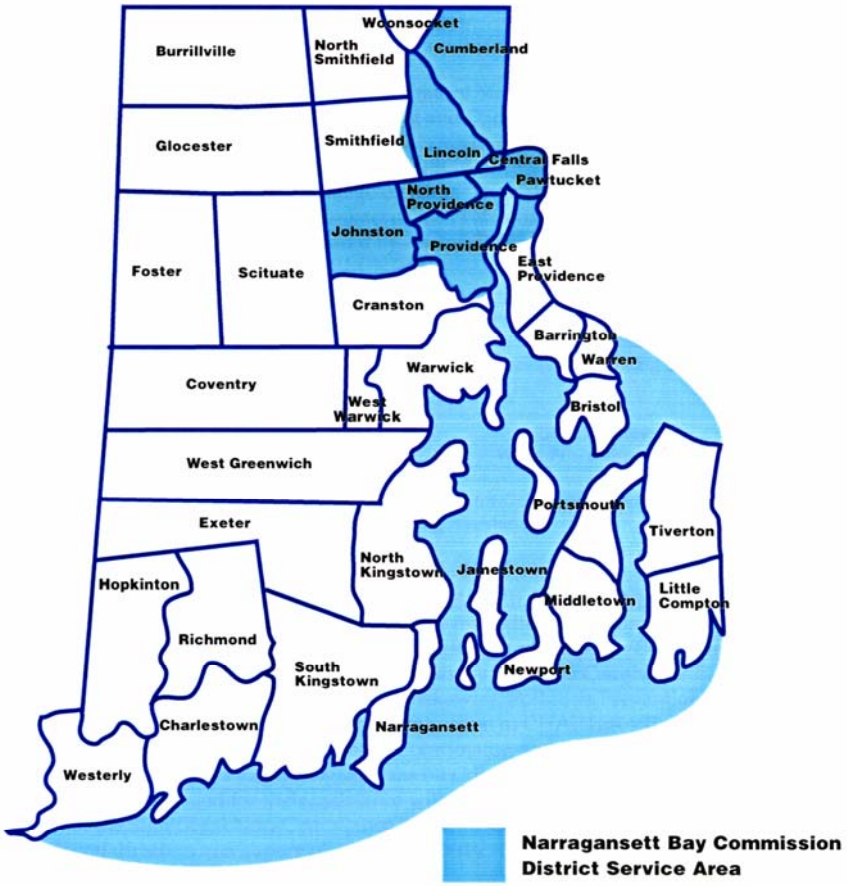
Narragansett Bay Commission
Mission Statement:

To maintain a leadership role in the protection and enhancement of water quality in Narragansett Bay and its tributaries by providing safe and reliable wastewater collection and treatment services to its customers at a reasonable cost.

Narragansett Bay Commission

Service Area

The Narragansett Bay Commission is Rhode Island's largest wastewater authority dedicated to providing reliable, cost-effective wastewater collection and treatment services to over 360,000 residents and 8,000 businesses in ten Rhode Island communities in the metropolitan Providence and Blackstone Valley areas. These communities include: Providence, North Providence, Johnston, Pawtucket, Central Falls, Cumberland, Lincoln, the northern portion of East Providence and small sections of Cranston and Smithfield.



ACKNOWLEDGMENTS

This report was written by Kerry M. Britt, Pretreatment Manager, with the assistance of the staff of the Pretreatment Program:

Nathan J. Dean
Assistant Pretreatment Manager

Abigail K. Bernier
Principal Pretreatment Engineer

Nathan Daggett and Katelyn Ludemann
Pretreatment Engineers

Travis H. Costa
Senior Pretreatment Technician

Kyle Gannon, Brian Steere, Jared Urban, Michael McBurney and Brandi-Lyn Colacone
Pretreatment Technicians

Sulema Martinez, Sandra Brown and Andrea DiCicco
Pretreatment Clerks

A special acknowledgment to Walter Palm, Laboratory Manager, the entire NBC Laboratory Staff and the staff of the Environmental Monitoring & Data Analysis (EMDA) Section. Their hard work allowed the NBC to successfully complete wastewater sampling and analysis of all significant industrial users discharging within the NBC districts and to conduct surveillance manhole monitoring of industrial and sanitary drainage districts. The data analysis presentation provided in CHAPTER V of this report, Impact of the Pretreatment Program on the Control of Toxics and Incompatible Waste, was prepared by John E. Motta, EMDA Manager, and the EMDA staff:

James H. Kelly III
Assistant EMDA Manager

Christine Comeau and Eliza Moore
Environmental Scientists

Karen Cortes
Environmental Data Analyst

Sara Nadeau, Rebecca Songolo and Jeffrey Tortorella
Monitoring Field Supervisors

Stephen DePasquale, Michael Golenia, David Thacker, Fern Johnson
Michael Giammarco, Joseph Caranci, and Amanda Kezirian
Environmental Monitors

Ashley Petteruto
EMDA Clerk

Laurie Horridge, Esq., Director of Executive Affairs, Jennifer Harrington, Esq., Chief Legal Counsel and Chloe Davis, Legal Counsel are to be credited for their effective Enforcement Program and their preparation of the Enforcement section, CHAPTER VI, of this report. The Environmental, Safety & Technical Assistance (ESTA) sections of this report were written by James McCaughey, P.E., ESTA Manager, with the assistance of Barry Wenskowicz, Pollution Prevention Engineer. Sewer Connection Program and Storm Water Mitigation sections of CHAPTER VII of this report were written by John Zuba, Permits & Planning Manager, with the assistance of Stephen Lallo, Permits Coordinator and Kimberly Kirwan, Planning, Policy and Regulation Administrative Assistant. Jamie Samons, the NBC Public Affairs Manager, is to be acknowledged for her assistance with various sections of this report, including development of the Significant Non-Compliance Public Notice. This assignment was completed under the direction and supervision of Thomas P. Uva, Director of Planning, Policy and Regulation.

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I. EXECUTIVE SUMMARY

The Narragansett Bay Commission

The Narragansett Bay Commission (NBC) was created in 1980 by the R.I. General Assembly. Shortly thereafter voters approved an $87.7 million bond referendum to reduce the amount of pollutants the Field's Point Wastewater Treatment Facility in Providence was discharging into Narragansett Bay and its tributaries. At that time, nearly 45 million gallons of untreated sewage flowed into Rhode Island waterways daily, resulting in temporary and permanent closures of shellfishing beds in Upper Narragansett Bay, violating federal laws, and most importantly, threatening public health and the region's environmental and economic well-being.

The NBC owns and operates the state's two largest wastewater treatment facilities and provides quality wastewater collection and treatment services to about 360,000 people and 8,197 commercial and industrial customers located in Providence, North Providence, Johnston, Pawtucket, Central Falls, Cumberland, Lincoln, the northern portion of East Providence, and small sections of Cranston and Smithfield. The Pretreatment Program is charged with protecting these treatment facilities and Narragansett Bay from the discharge of toxic and nuisance pollutants.

Field's Point Wastewater Treatment Facility

In 1982 the NBC took over the operation of the Field's Point Wastewater Treatment Facility (FP). Prior to the NBC taking over the operation, FP was discharging untreated wastewater to the receiving waters of Rhode Island. At that time, the treatment plant was receiving approximately one million pounds of metals per year in the plant's influent.

Field's Point Wastewater Treatment Facility

Since the NBC took over the ownership and operation, the plant has been transformed into a highly sophisticated, award winning facility. As the largest secondary wastewater treatment facility in Rhode Island and the second largest in New England, the Field's Point Wastewater Treatment Facility provides preliminary and primary treatment for up to 200 million gallons per day (MGD) of wastewater, secondary treatment for up to 91 MGD and in 2016 had an average daily flow to the facility of 38.1 MGD.

Three 1.5 megawatt (MW) industrial grade wind turbines were installed on the property in 2012. Each turbine is 365 feet high and combined can generate up to 4.5 MW of power. The NBC projected a 40% savings in energy costs per year. In fact, the NBC realized a 47.0% energy savings in 2016. Due to the success of these three wind turbines, the NBC purchased three additional 1.5 MW wind turbines that are remotely located in Coventry, Rhode Island. Additional information on the NBC energy programs can be found in CHAPTER VII.

Field's Point Wind Turbine and IFAS Tank

In addition to the wind turbine project, the NBC upgraded the Field's Point plant with Biological Nutrient Removal (BNR) technology to comply with Consent Agreement requirements to meet the new RIPDES nitrogen limitation of 5 ppm. The ten existing secondary treatment aeration tanks were converted to Integrated Fixed Film for Activated Sludge (IFAS) tanks, an advanced treatment technology and this project made Field's Point the largest IFAS treatment plant in the world. These tanks have five zones, both aerobic and anoxic, that wastewater travels through in order to remove nitrogen. Media is added to each IFAS tank to provide a substrate where a film of nitrifying bacteria can grow and be retained in the treatment tank. All of the tanks have been converted and nitrogen concentrations have decreased dramatically in the plant effluent. The seasonal 2016 nitrogen load to the Providence River decreased by 86.9% from 2003 loading levels, the year of the Greenwich Bay fish kill. The NBC was required to comply with the seasonal total nitrogen permit limit of 5.0 ppm beginning in May of 2014. Throughout the 2016 permit season, Field's Point met the total nitrogen permit limits of 5.0 ppm and 2,711 pounds per day, averaging a seasonal discharge concentration of 3.46 ppm and 1,026 pounds per day. The annual average total nitrogen discharged from Field's Point was 4.94 ppm and 1,676 pounds per day in 2016.

IFAS Media

Bucklin Point Wastewater Treatment Plant

In 1992, the R.I. General Assembly expanded the NBC mission by placing it in charge of the Bucklin Point Wastewater Treatment Facility in East Providence. This facility is designed to provide secondary treatment of 46 million gallons per day, and the average daily flow was 16.3 MGD in 2016. During 1999, supervisory management of this plant was privatized and United Water was the management contractor of the Bucklin Point plant through June 2015. In July 2015, the NBC resumed the supervisory management of Bucklin Point.

During 2006 the Bucklin Point plant completed a series of facility upgrades. A wet weather treatment facility was built that significantly reduced weather by-pass events by allowing the plant to process up to 116 MGD during wet weather. The facility upgrades included biological nitrogen removal treatment (BNR) and replaced chlorine disinfection by the use of ultraviolet light (UV). An enhanced BNR treatment system went on-line in 2014. The plant was upgraded to a four stage nitrification/denitrification process from a two stage process. Also, a building on site was converted to hold a carbon source for the BNR process. Bucklin Point was to comply with the seasonal total nitrogen limitation of 5.0 ppm beginning in May 2014. The 2016 seasonal nitrogen loading from this facility to Narragansett Bay was reduced by 82.5% from 2003 loading levels, the year of the Greenwich Bay fish kill.

Bucklin Point Wastewater Treatment

Throughout the 2016 permit season, Bucklin Point did well to meet the total nitrogen limits of 5.0 ppm and 1,293 pounds per day. However, in June there were disruptions to the BNR process. These disruptions led to a monthly average nitrogen concentration of 5.31 ppm. The disruptions were attributed to an instrument that had been installed to reduce struvite build-up in the plant. Once the instrument was removed in late June, the nitrogen concentrations were within permit limits. The average total nitrogen discharged from May through October was 3.18 ppm and 388 pounds per day. The annual average total nitrogen discharged from Bucklin Point was 4.03 ppm and 571 pounds per day in 2016.

Pretreatment Annual Report Overview

CHAPTER I of this report provides an overview of the NBC, its unique and innovative approaches to source reduction and control and provides a summary of each chapter of the annual report. Also contained in this chapter is a section regarding firms that have had their user classification changed during 2016, including a list of new significant industrial users and a section regarding firms that experienced major changes in water usage in 2016. A summary of the work done over the past year by the Pretreatment, Environmental Monitoring, and Enforcement Sections of the NBC is provided at the end of this chapter in TABLES 3, 4, 5, and 6, the Pretreatment Performance Summary Sheets for both districts.

CHAPTER II describes the administration of the NBC Pretreatment Program including the status of Pretreatment, Environmental Monitoring & Data Analysis (EMDA), Environmental, Safety & Technical Assistance (ESTA), Permits & Planning, and Laboratory staff, a summary of the budgets for these sections, staff training, the Pretreatment information management system and public information and education methods used by the NBC.

CHAPTER III details the industrial and commercial user base of the NBC and includes the NBC permit classification system, user inspections and emergency and special investigations. During 2016, Pretreatment staff issued 388 permits to users located in the Field's Point and Bucklin Point Districts, conducted 2,032 facility inspections, held 50 regulatory compliance meetings with users and responded to 21 emergency or special investigations.

CHAPTER IV details the compliance monitoring protocols and provides a review of all types of monitoring results including user self-monitoring, NBC monitoring of users, and surveillance manhole sampling results. During 2016, the NBC conducted 188 sampling inspections, performed 336 manhole sampling events, and reviewed 2,660 analytical reports of users located in the Field's Point and Bucklin Point Districts.

CHAPTER V of this report provides an analysis of the toxic pollutant loadings contained in the wastewater influent, effluent, and sludge for the Field's Point and Bucklin Point Wastewater Treatment Facilities. This analysis shows that the total metals loading to Field’s Point slightly decreased during 2016 by 1,958.4 pounds, or 7.4% when compared to 2015. Similarly, the total metals loading to Bucklin Point decreased by 1,962.5 pounds, or 14.6% when compared to 2015. The cyanide loading to Field’s Point increased slightly by 5.2 pounds, or 0.5% in 2016, and the cyanide loading to Bucklin Point decreased by 68.5 pounds or 19.5%. Loadings to both facilities were well within the Maximum Allowable Headworks Loadings (MAHL) established for each plant.

CHAPTER VI details the types of enforcement actions used by the NBC and reviews the enforcement actions initiated by the NBC over the past year. During 2016, the NBC issued 1,878 Notice of Violation letters. The NBC issues some type of enforcement action against 100% of the violators of the NBC Rules and Regulations.

CHAPTER VII of this report details projects and programs underway and those already completed by the Planning, Policy & Regulation Division of the Narragansett Bay Commission.

CHAPTER VIII reviews the status of the goals established by the Pretreatment, EMDA, ESTA, Laboratory, and Permits & Planning Sections for 2016 and describes the ambitious goals established by these sections for 2017.

Unique Program Elements, Activities, Awards And Accomplishments

The NBC uses innovative and unique activities, projects, and programs to control and reduce the discharge of toxic and nuisance pollutants into the sewer system. The following is a short summary of these innovations and unique programmatic elements, along with a summary of NBC awards and accomplishments for the past year. Details about each of these innovations, accomplishments, and awards can be found within the chapters of this report.

User Education, Training and Outreach

- Workshops and public presentations regarding Pollution Prevention, Pretreatment, Storm Water Management, Sewer Connection, Water Quality, and Monitoring topics
- Periodic informational mailings to permitted users
- Press releases and public notices
- Development and distribution of fact sheets, Best Management Practice (BMP) documents, and case studies summary sheets
- NBC informational websites (http://www.narrabay.com and http://snapshot.narrabay.com)
- Phase III CSO Stakeholders Process
- Citizens Advisory Committee

Special Projects, Programs, and Studies

- Environmental Merit Award Programs, include:
  - ~ Pollution Prevention Award
  - ~ Perfect Compliance Award
  - ~ Storm Water Management Award
- Grease Control Program, which has greatly reduced sewage backups and overflows attributable to grease accumulations in sewer lines
- Silver and Mercury loading reduction and evaluation program
- River Water Quality Monitoring Program
- Residential Septage Hauler Discharge Control Permitting Program
- Wet Weather CSO Monitoring Program
- Regional Ocean Modeling Systems Hydrodynamic Model Development Project
- Evaluation of bacteria sources to receiving waters

- Fixed Site Monitoring Network Project to monitor Narragansett Bay water quality and provide on-line monitoring data to the public
- Computerization of Sewer System Mapping
- Woon River Environmental Education Program
- River Restoration Initiative
- Energy Management Program including alternative energy evaluations
- Sustainable Energy Management of Wastewater Treatment Facilities Program

Permitting

- Prompt and standardized user plan reviews through weekly internal plan review meetings
- Permitting of all users with process wastewater discharges to the sewer system
- Unique and equitable rate structure with varying rates dependent upon hydraulic/pollutant loadings, which covers the cost to operate the Pretreatment Program
- Permitting of facilities recycling and/or disposing process wastewater off site as they have the potential to discharge to the sewer system via sanitary connections
- Aggressive program of permitting all users that greatly exceeds EPA permitting requirements
- Sewer connection permitting referral program with cities and towns

NBC Monitoring Program

- Aggressive program of sampling permitted users
- NBC internal goal to sample every Significant Industrial User (SIU) twice per twelve month period, exceeding EPA requirements
- Clean sampling programs utilized by the EMDA Section
- Extensive use and documentation of all standard operating procedures to ensure quality assurance and quality control that greatly exceeds EPA requirements
- Extensive receiving water and POTW sampling programs
- Sanitary and industrial surveillance manhole monitoring conducted weekly to monitor compliance and loadings to the treatment facilities
- Septage monitoring program to scan for toxic, industrial and non-residential quality waste

NBC Inspection Program

- NBC internal goal to inspect every SIU at least twice per twelve month period, exceeding EPA requirements
- Development and use of SIU annual inspection form ensures thorough and standardized inspections of each SIU
- Zero discharge firms are inspected at least twice per year to ensure compliance with permit requirements
- Extensive inspections of non-significant industrial and commercial users performed annually

- Monthly inspections of industrial areas/mill complexes are conducted to ensure all sources of non-sanitary wastewater are permitted in accordance with the NBC Rules and Regulations
- Intensive restaurant inspection program to verify grease trap maintenance
- All NBC inspections stress user education regarding EPA Significant Non-Compliance (SNC) criteria, NBC mission statement, and available compliance programs, in addition to addressing regulatory compliance issues. This has contributed to the decreased rates of SIU Significant Non-Compliance
- Response to 100% of reports regarding chemical spills, unusual influents, odors, etc.

User Self-Monitoring

- Permitted users are required to conduct regularly scheduled self-monitoring of their final effluent as well as batch discharges. The frequency of self-monitoring ranges from bi-annually to monthly and is dependent on the category and hydraulic loading from the facility
- Four consecutive weeks of resampling indicating full compliance is required for any effluent violation recorded. Benefits include: users are brought back into compliance quickly, SNC is reduced due to increased monitoring, reduced loadings to sewer, escalated enforcement due to additional evidence, etc.
- SIU permit required monitoring greatly exceeds that required by EPA regulations

Computerized Compliance and Data Tracking System

- Networked computer database consisting of all company, permit and compliance information which is available via desktop and tablet connections to all Pretreatment, ESTA, EMDA, and Enforcement staff
- Pretreatment system software has been upgraded to increase functionality and is expandable
- System automatically generates violation letters for any non-compliance event and tracks all user requirements
- System calculates SNC and enables flagging of any user approaching SNC, allowing staff to implement corrective actions

Pollution Prevention Program

- Free technical compliance assistance program
- On site consultations and pilot testing
- Routine referrals for pollution prevention assistance by regulatory staff in all Notices of Violation (NOV) and other user correspondence and communications
- Solicitations for pollution prevention assistance by ESTA staff directly to industries
- Extensive educational efforts
- Free water audits conducted of businesses, large residential buildings and industries

Staff Training

- NBC provides extensive training to its employees, including safety and procedural training
- Pretreatment, EMDA and ESTA staff receive 40-hour HAZWOPER and annual 8-hour HAZWOPER refresher training
- NBC has a tuition reimbursement program to assist employees to further their education and enhance their performance
- Intrasectional Training
- Interagency Training

Enforcement

- Some type of enforcement action issued against 100% of violators
- Cost of SNC Public Notice billed to firms published
- Use of innovative settlement agreements, which may include:
  - ~ Community based environmental projects
  - ~ Development of public service announcements
  - ~ Purchase of Pollution Prevention and Monitoring Equipment
  - ~ Use of Supplemental Environmental Projects
- Environmental Enforcement Fund - Penalties assessed are deposited into this NBC fund, from which special environmental projects and/or enforcement equipment and resources are funded. NBC received EPA Environmental Merit Award in 1995 and AMSA Public Service Award in 1995 and 2000 for this fund
- In-house legal staff available for quick enforcement response
- Work with state and federal criminal investigators regarding criminal pollution violations

2016 Accomplishments

~ ***Permitting:***

- 388 Permits issued
- 138 New permits issued to previously unpermitted firms
- 250 Revised permits issued

~ ***Inspections and Sampling:***

- 2,032 Non-sampling inspections conducted
- 268 Non-sampling inspections of SIUs
- 187 Non-sampling inspections of categorical users
- 81 Non-sampling inspections of significant non-categorical users
- 1,764 Non-sampling inspections of non-significant users
- 50 Regulatory Compliance meetings held with users
- Pretreatment staff reviewed 2,660 User Monitoring Reports
- 21 Emergency/Special Investigations Conducted
- 194 User Monitoring Reports generated by NBC
- 188 NBC Sampling Inspections of Industry

- 69 Different Facilities Sampled by NBC
- 175 Monitoring Reports of SIUs generated
- 108 Monitoring Reports of Categorical Users generated
- 67 Monitoring Reports of significant non-categorical users generated
- 13 Monitoring Reports of non-significant users generated
- 336 Manhole Sampling Events conducted
- 290 Industrial Surveillance Manhole Sampling Events conducted
- 46 Sanitary Manhole Sampling Events conducted

~ ***Enforcement:***

- 1,878 NOV Letters Issued
- 11 Firms listed in the February 23, 2017 Public Notice in the Providence Journal as being in Significant Non-Compliance (SNC)
- All but three of the 11 firms listed in SNC achieved full compliance with cited violations prior to publication of the Public Notice

~ ***User Compliance:***

- 5.4% Rate of SIU Significant Non-Compliance (SNC) in Field's Point District for 2016, a reduction from 39% in 1992
- Rate of SIU SNC reduced in Bucklin Point from 44.8% in 1994 to 8.8% for 2016
- Overall rate of SIU SNC is 7.0% in 2016
- 94.2% Overall Rate of Compliance for All Significant Users
- 96.9% Overall Rate of Compliance for All Categorical Users
- 94.5% Overall Rate of Compliance for All Non-Significant Users
- 94.4% Overall Rate of Compliance for All Users
- 71.1% of EPA categorically regulated users had perfect effluent compliance records with all effluent parameters excluding pH
- 71.4% of Significant Users AND 90.8% of all users had perfect effluent compliance records with effluent pollutants excluding pH
- Rate of SNC has been significantly reduced in both sewage districts over the past decade through Pretreatment's User Education Methods

Notification of Changes in User Status

During 2016, two users were reclassified from significant to non-significant. One of the two users that were reclassified was a categorical user. The other user was non-categorical. Both of the users were reclassified to non-significant because they went out of business. One of the two users was located in the Field's Point district and eliminated 1,204 gallons per day of industrial flow to the Field's Point facility. The remaining user that was reclassified was located in the Bucklin Point district and eliminated 30,646 gallons per day of industrial flow to the Bucklin Point facility.

In 2016, there were two new SIUs, one is located in the Bucklin Point district and contributes 9,621 gallons per day of industrial flow to the plant. This new Bucklin Point SIU conducts polyvinyl chloride and rubber compounding operations. The other new SIU is located in the Field's Point district and will contribute 74,000 gallons per day of industrial flow to the plant. The new Field's Point SIU will conduct waste food to energy operations.

A review of the baseline monitoring reports submitted by the newly classified SIUs indicates that the discharge from these facilities had no adverse effect on the quantity or quality of effluent discharged from either the Field's Point or Bucklin Point Wastewater Treatment Facilities. The SIUs which were reclassified during 2016 and the reason for each reclassification are detailed in TABLE 1.

TABLE 1

2016 Significant Industrial Users Classification Changes

Firms Reclassified to Non-Significant

Field's Point Firms	*Reason for Reclassification*
R.E. Sturdy Company, Inc.	Firm is out of business.

Bucklin Point Firms	*Reason for Reclassification*
Microfibres, Inc.	Firm is out of business.

Newly Classified Significant Users

Field's Point Firms	*Reason for Reclassification*
Orbit Energy Rhode Island, LLC	Firm discharges greater than 5,000 gallons per day.

Bucklin Point Firms	*Reason for Reclassification*
Teknor Apex Co.	Firm discharges greater than 5,000 gallons per day.

There were no SIUs with name changes in 2016.

During 2016, 20 Field's Point SIUs had changes in water usage that is noted in this section. Twelve of the 20 firms increased their water usage by a combined total of 65,907 gallons per day. The remaining eight of the 20 firms decreased their water usage by a combined total of 23,598 gallons per day. The net change to the Field's Point facility is an increase of 42,309 gallons per day of industrial flow. This increase in industrial flow did not have an adverse effect on the quality of wastewater discharged from the Field's Point treatment facility.

Twenty Bucklin Point SIUs experienced notable changes in water usage during 2016. Eleven of the 20 SIUs increased their water usage by a combined total of 27,680 gallons per day. None of the 20 SIUs decreased their water usage by a combined total of 89,637 gallons per day. The net change in flow to Bucklin Point is a decrease of 61,957 gallons per day of industrial flow. This decrease in industrial flow did not have an adverse effect on the quality of wastewater discharged from the Bucklin Point treatment facility.

The SIUs with significant changes in water usage during 2016 are detailed in TABLE 2.

TABLE 2

2016 Significant Industrial User Changes in Water Usage

Firms with Increased Flow

Field's Point

Company	*Change in Flow (gpd)*	*% Change*
Contract Specialties, Inc.	1,203	25.5%
DiFruscia Industries, Inc.	4,489	22.0%
Induplate, LLC	17,851	62.5%
International Chromium Plating Co., Inc.	252	25.5%
Mahr Federal, Inc.	170	13.0%
Monarch Metal Finishing Co. - Aurora Street	1,849	134.4%
Narragansett Jewelry d/b/a C&J Jewelry Co.	1,508	45.6%
Providence Journal Company - Production Facility	20,321	104.5%
Technodic, Inc.	482	14.3%
Umicore USA, Inc.	7,098	33.3%
Univar USA, Inc.	10,583	169.2%
Universal Plating Co., Inc.	101	14.4%

Bucklin Point

Company	*Change in Flow (gpd)*	*% Change*
Accent Plating Company	1,785	111.6%
Cintas Corporation	5,957	8.7%
Darlene Group	208	114.3%
Eaton Corporation	62	17.9%
John H. Collins Sons, Inc.	1,976	101.8%
Liquid Blue	3,908	36.9%
Materion Technical Materials, Inc.	5,810	13.0%
Pawtucket Power Associates	7,400	64.0%
Stackbin Corporation	225	86.5%
Tedor Pharma, Inc.	62	62.6%
Teknicote, Inc.	287	25.1%

TABLE 2
(continued)

2016 Significant Industrial User Changes in Water Usage

Firms with Decreased Flow

Field's Point

Company	*Change in Flow (gpd)*	*% Change*
Armbrust International, Ltd.	-2,376	-18.2%
E&M Enterprises, Ltd.	-2,315	-25.7%
Eastern Color & Chemical Company	-136	-11.4%
G. Tanury Plating Company	-14,700	-28.8%
Ideal Plating & Polishing Co., Inc.	-814	-18.9%
International Insignia Corporation	-1,511	-27.5%
Pilgrim Screw Corporation	-105	-78.4%
Tri-Jay Company	-1,641	-13.3%

Bucklin Point

Company	*Change in Flow (gpd)*	*% Change*
Angelica Textile Services, Inc.	-28,224	-33.2%
Aspen Aerogels Rhode Island, LLC	-45,073	-74.5%
Ecological Fibers, Inc.	-1,743	-34.5%
Godfrey & Wing, Inc.	-628	-20.9%
Hord Crystal Corporation	-125	-52.1%
Interplex Engineered Products, Inc.	-5,932	-10.3%
Lincoln Fine Ingredients	-319	-35.8%
Providence Metallizing Company, Inc.	-7,235	-24.6%
Tiffany and Company	-358	-30.0%

Pretreatment Program Performance Evaluation

Nationally, the EPA assesses the effectiveness of a pretreatment program by reviewing specific data submitted by each program. This data is reported on a standard EPA form entitled the Pretreatment Performance Summary Sheet. The Pretreatment Performance Summary Sheet contains general information about the sewage agency, the permitting and compliance status of significant industrial users, and the enforcement actions issued.

The NBC believes that the Pretreatment Program has achieved its stated goals and has been quite effective at reducing and controlling the discharge of toxics into the sewage system. This is evidenced by the fact that user compliance rates are excellent, no incidents of pass through or interference occurred, and treatment plant influent loading goals are being met. As a result, the NBC Pretreatment Program has been recognized twice by the U.S. EPA as being the *"Best Pretreatment Program in the Nation"*, receiving these awards in 1990 and 1998. In addition to the two national awards, the NBC Pretreatment Program received the 2009 EPA Region 1 Excellence Award.

Various factors are reviewed to properly evaluate and measure the effectiveness of a Pretreatment Program. These factors include the following:

- Industrial User Rate of Significant Non-Compliance;
- Effectiveness of Enforcement Response Program;
- Sufficiency of Program Funding and Staffing Levels;
- Application of Local Limits;
- Sufficiency of Statutory Authority and Rules and Regulations;
- Evaluation of recent and proposed program modifications;
- Pretreatment Performance Summary Sheet "Bean Counts".

The NBC routinely reviews all the aforementioned criteria to ensure that the Pretreatment Program satisfies and exceeds all EPA and DEM Pretreatment Program requirements. The following paragraphs detail the NBC efforts with regard to each criteria, as required by RIPDES permit requirements C(7)(i) and C(7)(j).

~ Evaluation of Significant Non-Compliance

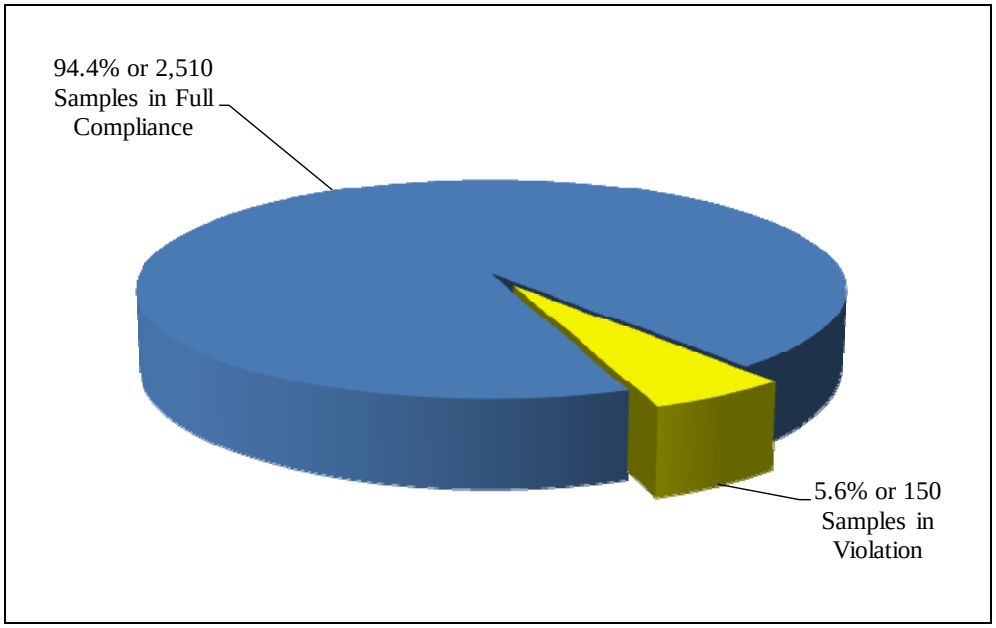
Through extensive user education efforts, quick enforcement response to user violations and regular monthly reminder telephone calls to users, the Pretreatment Section has over the years reduced its SIU rate of significant non-compliance substantially in both districts. The combined rate of SNC for significant industrial users located in the two NBC sewage districts for 2016 was 7.0%, a decrease from the SNC rate of 8.2% observed in 2015.

The SIU rate of SNC was dramatically reduced in Field's Point from a high of 39.0% in 1992 to 5.4% for 2016, while the SIU rate of SNC for Bucklin Point was reduced from a high of 44.8% in 1994 to 8.8% in 2016. These impressive reductions in the rate of SIU SNC are directly attributed to increased user education efforts made by the Pretreatment staff and by stringent regulatory requirements to promptly identify and correct user violations.

These Pretreatment educational efforts include informing users about the EPA SNC violation criteria during all inspections and by sending annual informational letters to remind users about permit requirements and SNC ramifications. Regulatory efforts to reduce SNC include imposing stringent resampling requirements over four consecutive weeks for any effluent monitoring violation, and by the implementation of a procedure to call users prior to a monitoring report being thirty (30) days late past the due date. In addition, Pretreatment runs monthly reports to identify companies with the potential to be in SNC. Staff contacts these companies and informs them of the steps necessary to avoid SNC.

As a result of these efforts, the NBC has been able to maintain overall SIU rates of SNC to 10% or below. As can be seen from FIGURE 1, 94.4% of the 2,660 analytical reports reviewed by the Pretreatment staff during 2015 were in full compliance with effluent discharge limitations, standards which are more stringent than EPA categorical standards.

FIGURE 1
USER COMPLIANCE RATE
FOR ALL EFFLUENT ANALYSES



2,660 Total Analyses Reviewed

In addition, as shown in CHAPTER IV of this report, the 2016 rate of compliance of categorical users in the two districts was 96.9%, while the compliance rate for significant users was 94.2%. These excellent rates of user compliance with effluent limits are reflected in the long term reductions in toxic loadings to the Field's Point and Bucklin Point treatment facilities, as shown in CHAPTER V of this report.

Eleven firms located in the Field's Point and Bucklin Point districts were listed in a Public Notice in the Providence Journal on February 23, 2017 as being in SNC for the period from October 1, 2015 through December 31, 2016. Of the eleven firms published for being in SNC, six users are located in Field's Point and five users are located in Bucklin Point.

The names of two categorical and three non-categorical significant users were published for being in SNC, two are located in Field’s Point and three are located in Bucklin Point. Six non-categorical industrial users were listed in the Public Notice, four from Field’s Point and two from Bucklin Point. Six of the eleven firms, or 54.5%, were listed as being in SNC solely for administrative violations such as submitting a report late. Four firms

listed in the notice were cited as being in SNC solely due to violations of effluent limitations. One firm was listed as being in SNC for violations of effluent limitations and failing to submit a report on time. At the time of publication of this report, all but three of the facilities cited as being in SNC were back in full compliance with NBC regulations.

~ Effectiveness of NBC Enforcement Response Program

The NBC has a very aggressive and effective enforcement program. The Pretreatment Program issues some type of enforcement action for 100% of all violations observed, in accordance with the NBC approved Enforcement Response Plan (ERP). Pretreatment staff works very closely with the Legal Section and has the capability to issue an Administrative Order or Cease and Desist Order immediately, if necessary, to halt illicit discharges as detailed in the approved ERP.

During 2016, the NBC issued 1,878 Notice of Violation letters and one Administrative Order. The NBC Enforcement Program is efficient and clearly effective at ensuring users comply with NBC regulations and requirements. Additional information regarding the Enforcement Program is provided in CHAPTER VI.

~ Sufficiency of Program Funding and Staffing Levels

The NBC has provided continual support and funding to the Pretreatment, EMDA, ESTA, Permits & Planning, and Laboratory Sections, the teams responsible for controlling and reducing toxic loadings to the NBC treatment facilities and Narragansett Bay. This funding commitment has ensured adequate staffing levels necessary to get the job done in an exemplary manner. Additional information regarding the budgets and staffing of these sections is provided in CHAPTER II.

~ Application of Local Limits

The two NBC Wastewater Treatment Facilities have separate and distinct local limits designed to protect each wastewater treatment facility from pass-through and interference, ensuring the proper operation of the facility, to protect the receiving waters of the state, to protect the sludge quality and to protect the health and safety of NBC workers and the general public. The local limits are rigidly enforced by the NBC Pretreatment staff. The NBC routinely reviews influent, effluent, sludge, and receiving water analytical data to ensure that the NBC local limits are appropriate for each treatment facility. Based upon this review and on-going studies being conducted by the NBC, the existing local limits are appropriate and enforceable. A review of the local limits and loading evaluations for each NBC plant is provided in CHAPTER V of this report.

During 2004, the NBC was required to submit a final metals compliance report as required by a Consent Agreement with the DEM (RIA-330). This report included a re-evaluation of local limits for both Field's Point and Bucklin Point using the July 2004 EPA Local Limits Development Guidance. Plant data, background loadings, and site-specific metal translators were developed for both facilities to determine local limits that protect plant operations and infrastructure, human health, and the NBC receiving waters, while allowing for the safe disposal of solids extracted from the collection system. The findings of this report indicate that the current local limits are both appropriate and enforceable. In addition, this report details analytical data indicating that the NBC receiving waters are meeting EPA Water Quality Criteria for toxic pollutants, clearly proving that the local limits are adequate for protecting the receiving waters of Narragansett Bay.

~ Sufficiency of Statutory Authority and Rules and Regulations

The NBC has statutory authority detailed in the State of Rhode Island General Laws, Title 46, Chapter 25 et seq. This legislation permits the NBC to develop, adopt, and enforce Rules and Regulations for use of the sewage system. In 2006, the NBC petitioned the DEM to revise the Rules and Regulations. The NBC requested revisions to the Significant Non-Compliance definitions as required by the EPA Pretreatment Streamlining rules as well as voluntary changes outlined by the Streamlining rules. These Revisions can be found in Article 2 of the Rules and Regulations. Other revisions concerning the Pretreatment Program were made to clarify existing regulations. In addition, the NBC made minor revisions to the Rules and Regulations regarding sewer connections. The revised Rules and Regulations were approved by the DEM and became effective on December 20, 2006. The NBC Rules and Regulations satisfy all EPA and DEM requirements and are fully enforceable. The NBC Rules and Regulations are available on-line at www.narrabay.com.

~ Evaluation of Recent and Proposed Program Modifications

The NBC has an approved Enforcement Response Plan (ERP). The initial ERP was approved by the DEM and adopted by the NBC in 1994. This ERP outlined the actions the NBC would take to escalate enforcement against companies violating the NBC Rules and Regulations and the terms of their Wastewater Discharge Permits. Escalated enforcement actions may include the issuance of Administrative Orders, Compliance Orders or Cease and Desist Orders.

The NBC re-evaluated its approach to user compliance after the ERP was originally adopted in 1994. The revised approach is proactive and educational in nature. Many educational programs have been developed and implemented. These programs educate users on the NBC Rules and Regulations, their permit requirements, and assist them to achieve and maintain compliance. Pretreatment and ESTA staff work together with the implementation of these programs. These programs have been very successful at bringing non-compliant users into compliance and have contributed to the reduction in the number of users in significant non-compliance with NBC and EPA regulations.

Even with the implementation of these proactive, educational programs, the NBC takes non-compliance with its Rules and Regulations very seriously. Therefore, Notices of Violation (NOV) are issued for every violation of the NBC Rules and Regulations and permit requirements. The issuance of escalated enforcement action in the form of an Administrative Order may be necessary to protect the NBC's treatment facilities and subsequently Narragansett Bay. In cases where there is not imminent endangerment to NBC facilities or the health of Narragansett Bay, there may be a deferment in the time before the issuance of an Administrative Order to allow ESTA staff the opportunity to work with industry to address compliance issues. The NBC revised the ERP to accurately reflect the proactive, educational approach. The revision was required by the RIPDES permits issued by the DEM to the NBC in December 2001. The NBC revised the ERP in 2002 to accurately reflect the enforcement protocols followed by the NBC. The final ERP was approved by the DEM in September 2003.

In 2004, the NBC implemented a non-substantial change in the allowable pH limitations for both treatment facilities. The change standardized the pH limitations at both treatment facilities to 5.0 standard units (s.u.) - 11.0 s.u. at all times. Previously the pH limitations were 5.0 s.u. - 10.0 s.u. in Field's Point and 5.5 s.u. - 9.5 s.u. in Bucklin Point. The NBC requested this modification in a request to revise the Rules and Regulations. The DEM determined the modification to be a non-substantial program modification and these changes became effective on December 13, 2004. There were no Pretreatment Program modifications in 2016.

~ Pretreatment Performance Summary Sheets

The U.S. EPA measures the effectiveness of a Pretreatment Program by tracking routine activities performed by the program. These include the number of users of each type, number of violations cited, number of inspections conducted, number of permits issued, number of sampling events conducted, amount of penalties assessed, etc. This information is provided in the Pretreatment Performance Summary Sheets. The Pretreatment Performance Summary Sheets, one for each NBC sewage district, are provided in TABLES 3 and 5 and detail the 2016 accomplishments of the NBC Pretreatment, Environmental Monitoring, and Enforcement Programs. In early 2008, the EPA revised the Pretreatment Performance Summary Sheet. The revised summary sheets can be found in TABLES 4
and 6.

TABLE 3

NARRAGANSETT BAY COMMISSION

FIELD'S POINT DISTRICT

PRETREATMENT PERFORMANCE SUMMARY SHEET

1. General Information

Control Authority Name	Narragansett Bay Commission
Address (treatment facility)	2 Ernest Street, Providence, RI 02905
(main office)	1 Service Road, Providence, RI 02905
(pretreatment office)	2 Ernest Street, Providence, RI 02905
Contact Persons	Raymond Marshall, P.E. , Executive Director
	Thomas P. Uva, PP&R Director
	Kerry M. Britt, Pretreatment Manager
Contact Telephone	(401) 461-8848
RIPDES Number	RI 0100315
Reporting Period	January 1, 2016 - December 31, 2016
Total Categorical Industrial Users as of the date of this report (throughout the reporting period)	25 (26) (See Note 1)
Total Significant Non-Categorical IUs as of the date of this report (throughout the reporting period)	11
Total # Significant Industrial Users (SIUs)	36 (37) (See Note 1)

2. Significant Industrial User (SIU) Compliance

	Significant Industrial Users	
	Categorical	**Non-Categorical**
1. # Of SIUs Submitting BMRs/# Required	4/4	2/2
2. # Of SIUs Submitting 90-Day Compliance Reports/# Required	0/0	0/0
3. # Of SIUs in SNC with Pretreatment Compliance Schedule/ # Required To Meet Schedule	0/0	0/0
4. # Of SIUs In Significant Noncompliance With Self Monitoring Reporting Requirements and have not returned to compliance	0	0
5. # Of SIUs in SNC for Violating Effluent or Reporting Requirements and have Not had Adequate Enforcement Action by POTW	0	0
6. # Of SIUs in SNC with Reporting Requirements At End of Report Period	0	0
7. # Of SIUs in SNC With Effluent Requirements At End of Report Period	0	0

TABLE 3

(continued)

NARRAGANSETT BAY COMMISSION

FIELD'S POINT DISTRICT

PRETREATMENT PERFORMANCE SUMMARY SHEET

3. Compliance Monitoring Program

	Significant Industrial Users	
	Categorical	**Non-Categorical**
1. # Of Control Documents Issued/# Required	4/4	2/2
2. # Of SIUs Without Active (Expired) Permits	0	0
3. # Of SIUs With Permits Expired For 180 Days Or More	0	0
4. # Of Non-Sampling Inspections Conducted	97	39
5. # Of Sampling Visits Conducted	63	36
6. # Of Facilities Inspected (Nonsampling)	26	11
7. # Of Facilities Sampled	26	10 (See Note 2)
8. # Of SIUs (Both) Not Inspected And Not Sampled By POTW In Past 12 Months	0	0
9. # Of SIUs Not Sampled/Not Inspected By POTW In Past 12 Months	0/0	1/0 (See Note 2)
10. # Of SIUs in SNC with Self Monitoring and Not Inspected and Not Sampled in the Past 12 Months	0	0

TABLE 3
(continued)
NARRAGANSETT BAY COMMISSION
FIELD'S POINT DISTRICT
PRETREATMENT PERFORMANCE SUMMARY SHEET

4. Enforcement Actions

	Significant Users			
	Categorical	**Non-Categorical**	**Non-Significant**	**Total All Users**
1. Compliance Schedules Issued	0	0	0	0
2. Notices Of Violation Issued	165	57	1,063	1,285
3. Admin. Orders Issued	1	0	0	1
4. Combined Total Of Administrative Orders and Notices of Violation	166	57	1,063	1,286
5. Civil Suits Filed	0	0	0	0
6. Criminal Suits Filed	0	0	0	0
7. Combined Total of Civil and Criminal Suits	0	0	0	0
8a. Published IUs in SNC (See Newspaper Notice in Enforcement Chapter)	1	1	4	6
8b. Rate of IUs in SNC	1/26 = 3.8%	1/11 = 9.1%	N/A	N/A
9a. Amount Of Penalties Collected (Total Dollars/IUs Assessed)	$4,000/1	$0/0	$0/0	$4,000/1
9b. Amount Of Penalties Assessed (Total Dollars/IUs Assessed)	$23,500/1	$0/0	$0/0	$23,500/1
10. # of IUs Subject to Any Enforcement Action	21	6	425	452
11. Other Actions (Permit Suspensions, Sewer Bans, Etc.)	0	0	0	0

I certify that the information contained in the Pretreatment Performance Summary Sheet is complete and accurate to the best of my knowledge.

Kevin McBee — March 15, 2017

AUTHORIZED REPRESENTATIVE **DATE**

TABLE 3
(continued)
NARRAGANSETT BAY COMMISSION

FIELD'S POINT DISTRICT

PRETREATMENT PERFORMANCE SUMMARY SHEET

Notes Regarding the Pretreatment Performance Summary Sheets

Note 1: Numbers in parentheses () reflect totals for users classified as significant for some time during the reporting period. Some of these companies are no longer classified as SIUs since they may have changed process operations eliminating discharges to the sewer.

Note 2: The non-categorical SIU not sampled by the NBC in 2016 was under construction throughout 2016 and did not discharge process wastewater in 2016.

TABLE 4

NARRAGANSETT BAY COMMISSION

FIELD'S POINT DISTRICT

REVISED PRETREATMENT REPORT SUMMARY SHEET

January 1, 2016 through December 31, 2016

POTW Name:	Narragansett Bay Commission (NBC)
NPDES Permit #:	RI0100315
Pretreatment Report Period Start Date:	January 1, 2016
Pretreatment Report Period End Date:	December 31, 2016
# of Significant Industrial Users (SIUs):	33 (34) (See Note 1)
# of SIUs Without Control Mechanisms:	0
# of SIUs not Inspected:	0
# of SIUs not Sampled:	1 (See Note 2)
# of SIUs in Significant Noncompliance (SNC) with Pretreatment Standards:	2
# of SIUs in SNC with Reporting Requirements:	1
# of SIUs in SNC with Pretreatment Compliance Schedule:	0
# of SIUs in SNC Published in Newspaper:	2
# of SIUs with Compliance Schedules:	0
# of Violation Notices Issued to SIUs:	222
# of Administrative Orders Issued to SIUs:	1
# of Civil Suits Filed Against SIUs:	0
# of Criminal Suits Filed Against SIUs:	0
# of Categorical Industrial Users (CIUs):	25 (26) (See Note 1)
# of CIUs in SNC:	1
Penalties Total Dollar Amount of Penalties Collected:	$4,000
# of IUs from which Penalties have been collected:	1

TABLE 4
(continued)
NARRAGANSETT BAY COMMISSION

FIELD'S POINT DISTRICT

REVISED PRETREATMENT REPORT SUMMARY SHEET

January 1, 2016 through December 31, 2016

Local Limits Date of Most Recent Technical Evaluation of Local Limits:	September 30, 2004
Date of Most Recent Adoption of Technically Based Local Limits:	1987

Pollutant	**Limit (mg/l)**	**MAHL (lb/day)** (See Note 3)
Cadmium	0.11	6.1
Chromium	2.77	102.2
Copper	1.20	46.3
Lead	0.60	23.4
Mercury	0.005	0.5
Nickel	1.62	57.9
Silver	0.43	10.8
Zinc	2.61	137.0
Cyanide	0.58	2.4
Selenium	-	436.5
Arsenic	-	2.5

Note 1: Numbers in parentheses () reflect totals for users classified as significant for some time during the reporting period. Some of these companies are no longer classified as SIUs since they may have changed process operations eliminating discharges to the sewer.

Note 2: The non-categorical SIU not sampled by the NBC in 2016 was under construction throughout 2016 and did not discharge process wastewater in 2016.

Note 3: MAHL values were recalculated as a part of the Local Limits Re-evaluation that was submitted to the Rhode Island Department of Environmental Management in September 2004.

TABLE 5

NARRAGANSETT BAY COMMISSION

BUCKLIN POINT DISTRICT

PRETREATMENT PERFORMANCE SUMMARY SHEET

1. General Information

Control Authority Name	Narragansett Bay Commission
Address (treatment facility)	102 Campbell Avenue, East Providence, RI 02916
(main office)	1 Service Road, Providence, RI 02905
(pretreatment office)	2 Ernest Street, Providence, RI 02905
Contact Persons	Raymond Marshall, P.E. , Executive Director
	Thomas P. Uva, PP&R Director
	Kerry M. Britt, Pretreatment Manager
Contact Telephone	(401) 461-8848
RIPDES Number	RI 0100072
Reporting Period	January 1, 2016 - December 31, 2016
Total Categorical Industrial Users as of the date of this report (throughout the reporting period)	20
Total Significant Non-Categorical IUs as of the date of this report (throughout the reporting period)	13 (14)
Total # Significant Industrial Users (**SIUs**)	33 (34) (See Note 1)

2. Significant Industrial User (SIU) Compliance

	Significant Industrial Users	
	Categorical	**Non-Categorical**
1. # Of SIUs Submitting BMRs/# Required	3/3	4/4
2. # Of SIUs Submitting 90-Day Compliance Reports/# Required	0/0	0/0
3. # Of SIUs in SNC with Pretreatment Compliance Schedule/ # Required To Meet Schedule	0/0	0/0
4. # Of SIUs In Significant Noncompliance With Self Monitoring Reporting Requirements and have not returned to compliance	0	0
5. # Of SIUs in SNC for Violating Effluent or Reporting Requirements and have Not had Adequate Enforcement Action by POTW	0	0
6. # Of SIUs in SNC with Reporting Requirements At End of Report Period	0	0
7. # Of SIUs in SNC With Effluent Requirements At End of Report Period	0	0

TABLE 5
(continued)

NARRAGANSETT BAY COMMISSION

BUCKLIN POINT DISTRICT

PRETREATMENT PERFORMANCE SUMMARY SHEET

3. Compliance Monitoring Program

	Significant Industrial Users	
	Categorical	**Non-Categorical**
1. # Of Control Documents Issued/# Required	3/3	4/4
2. # Of SIUs Without Active (Expired) Permits	0	0
3. # Of SIUs With Permits Expired For 180 Days Or More	0	0
4. # Of Non-Sampling Inspections Conducted	85	54
5. # Of Sampling Visits Conducted	43	33
6. # Of Facilities Inspected (Nonsampling)	20	14
7. # Of Facilities Sampled	19 (See Note 2)	14 (See Note 2)
8. # Of SIUs (Both) Not Inspected And Not Sampled By POTW In Past 12 Months	0	0
9. # Of SIUs Not Sampled/Not Inspected By POTW In Past 12 Months	1/0 (See Note 2)	0/0
10. # Of SIUs in SNC with Self Monitoring and Not Inspected and Not Sampled in the Past 12 Months	0	0

TABLE 5
(continued)

NARRAGANSETT BAY COMMISSION

BUCKLIN POINT DISTRICT

PRETREATMENT PERFORMANCE SUMMARY SHEET

4. Enforcement Actions

	Significant Users			
	Categorical	**Non-Categorical**	**Non-Significant**	**Total All Users**
1. Compliance Schedules Issued	0	0	0	0
2. Notices Of Violation Issued	69	67	457	593
3. Admin. Orders Issued	0	0	1	1
4. Combined Total Of Administrative Orders and Notices of Violation	69	67	458	594
5. Civil Suits Filed	0	0	0	0
6. Criminal Suits Filed	0	0	0	0
7. Combined Total of Civil and Criminal Suits	0	0	0	0
8a. Published IUs in SNC (See Newspaper Notice in Enforcement Chapter)	1	2	2	5
8b. Rate of IUs in SNC	1/20 = 5.0%	2/14 = 14.3%	N/A	N/A
9a. Amount Of Penalties Collected (Total Dollars/IUs Assessed)	$0/0	$0/0	$2,500/1	$2,500/1
9b. Amount of Penalties Assessed (Total Dollars/IUs Assessed)	$0/0	$0/0	$2,500/1	$2,500/1
10. # of IUs Subject to Any Enforcement Action	14	12	213	239
11. Other Actions (Sewer Bans, Etc.)	0	0	0	0

I certify that the information contained in the Pretreatment Performance Summary Sheet is complete and accurate to the best of my knowledge.

AUTHORIZED REPRESENTATIVE

March 15, 2017
DATE

TABLE 5
(continued)

NARRAGANSETT BAY COMMISSION

BUCKLIN POINT DISTRICT

PRETREATMENT PERFORMANCE SUMMARY SHEET

Notes Regarding the Pretreatment Performance Summary Sheets

Note 1: Numbers in parentheses () reflect totals for users classified as significant for some time during the reporting period. Some of these companies are no longer classified as SIUs since they may have changed process operations eliminating discharges to the sewer.

Note 2: The categorical SIU that was not sampled by the NBC in 2016 discharges on a batch basis and decided to ship all process wastewater off-site for disposal in 2016. This was verified during inspections.

TABLE 6

NARRAGANSETT BAY COMMISSION

BUCKLIN POINT DISTRICT

REVISED PRETREATMENT REPORT SUMMARY SHEET

January 1, 2016 through December 31, 2016

POTW Name:	Narragansett Bay Commission (NBC)
NPDES Permit #:	RI0100072
Pretreatment Report Period Start Date:	January 1, 2016
Pretreatment Report Period End Date:	December 31, 2016
# of Significant Industrial Users (SIUs):	33 (34) (See Note 1)
# of SIUs Without Control Mechanisms:	0
# of SIUs not Inspected:	0
# of SIUs not Sampled:	1 (See Note 2)
# of SIUs in Significant Noncompliance (SNC) with Pretreatment Standards:	2
# of SIUs in SNC with Reporting Requirements:	1
# of SIUs in SNC with Pretreatment Compliance Schedule:	0
# of SIUs in SNC Published in Newspaper:	3
# of SIUs with Compliance Schedules:	0
# of Violation Notices Issued to SIUs:	136
# of Administrative Orders Issued to SIUs:	0
# of Civil Suits Filed Against SIUs:	0
# of Criminal Suits Filed Against SIUs:	0
# of Categorical Industrial Users (CIUs):	20
# of CIUs in SNC:	1
Penalties Total Dollar Amount of Penalties Collected:	$2,500
# of IUs from which Penalties have been collected:	1

TABLE 6

(continued)

NARRAGANSETT BAY COMMISSION

BUCKLIN POINT DISTRICT

REVISED PRETREATMENT REPORT SUMMARY SHEET

January 1, 2016 through December 31, 2016

Local Limits Date of Most Recent Technical Evaluation of Local Limits:	September 30, 2007
Date of Most Recent Adoption of Technically Based Local Limits:	1991

Pollutant	**Limit (mg/l)**	**MAHL (lb/day)** (See Note 3)
Cadmium	0.11	1.4
Chromium	2.77	28.6
Hexavalent Chromium	-	51.3
Copper	1.20	8.0
Lead	0.69	7.5
Mercury	0.06	0.03
Nickel	1.62	3.6
Silver	0.40	1.1
Zinc	1.67	45.2
Cyanide	0.50	0.3
Selenium	0.40	1.7
Arsenic	0.20	0.68

Note 1: Numbers in parentheses () reflect totals for users classified as significant for some time during the reporting period. Some of these companies are no longer classified as SIUs since they may have changed process operations eliminating discharges to the sewer.

Note 2: The categorical SIU that was not sampled by the NBC in 2016 discharges on a batch basis and decided to ship all process wastewater off-site for disposal in 2016. This was verified during inspections.

Note 3: MAHL values were recalculated as a part of the Local Limits Re-evaluation that was submitted to the Rhode Island Department of Environmental Management in September 2004.

II. PROGRAM ADMINISTRATION

RIPDES Permit Numbers

On December 31, 2001, the Rhode Island Department of Environmental Management, (DEM) Office of Water Resources issued new RIPDES permits to the Narragansett Bay Commission's two wastewater treatment facilities. The RIPDES permit number for the Field's Point Wastewater Treatment Facility is RI 0100315 and the RIPDES permit number for the Bucklin Point Wastewater Treatment Facility is RI 0100072. These RIPDES permits required nitrogen removal for the first time for the NBC plants, and due to this newly imposed requirement and several other issues, NBC appealed these permits. The NBC then worked with the DEM to resolve the issues of concern. A Consent Agreement, RIA-330, resolving the appealed conditions was signed by both parties and became effective in January 2004. The CA imposed more stringent nutrient limitations for both the Field's Point and Bucklin Point wastewater treatment facilities, but provided NBC time to install treatment and achieve compliance. The CA detailed requirements which the NBC need to satisfy to achieve compliance with the new limitations and require full compliance with interim limitations until such requirements are implemented. The RIPDES permits for both facilities have expired, however these permits remain in full effect until the DEM issues new permits to the NBC. The DEM issued draft RIPDES permits for both facilities on November 30, 2016. A public hearing on the permits was held on January 26, 2017. The public comment period was open until January 26, 2017. The public comment period was open until January 31, 2017 and extended until February 27, 2017 for comments on total nitrogen and $CBOD_5$ loading to the Field's Point facility. The permits are expected to be finalized in 2017.

Personnel

The control and reduction of toxic and nuisance discharges to the sewer falls under the Division of Planning, Policy & Regulation (PP&R) which works closely with and relies upon the resources of many other NBC sections to achieve its goal of protecting the two NBC treatment facilities and ultimately Narragansett Bay. From the wastewater operators that report unusual influents to the legal staff that issues escalated enforcement actions against violators, environmental protection is a team effort at the NBC. The organizational plan of the NBC is provided in FIGURE 2, while the organizational plan of the PP&R Division is provided in FIGURE 3.

The PP&R Division consists of five sections, the Pretreatment, Environmental, Safety & Technical Assistance (ESTA), Permits & Planning, Environmental Monitoring & Data Analysis (EMDA), and the Laboratory sections. PP&R is responsible for developing, implementing, and performing source reduction and control activities and programs for the NBC. The Pretreatment Section works to control the discharge of toxics through regulatory and user educational mechanisms, while the ESTA Section achieves pollutant reductions through user education efforts and by providing free technical assistance. Both sections rely upon the services and expertise of the EMDA and Laboratory Sections. The EMDA Section conducts user, river, treatment facility, and manhole monitoring activities and is responsible for logging and reviewing data reported on samples analyzed by the Laboratory Section.

FIGURE 2
Narragansett Bay Commission

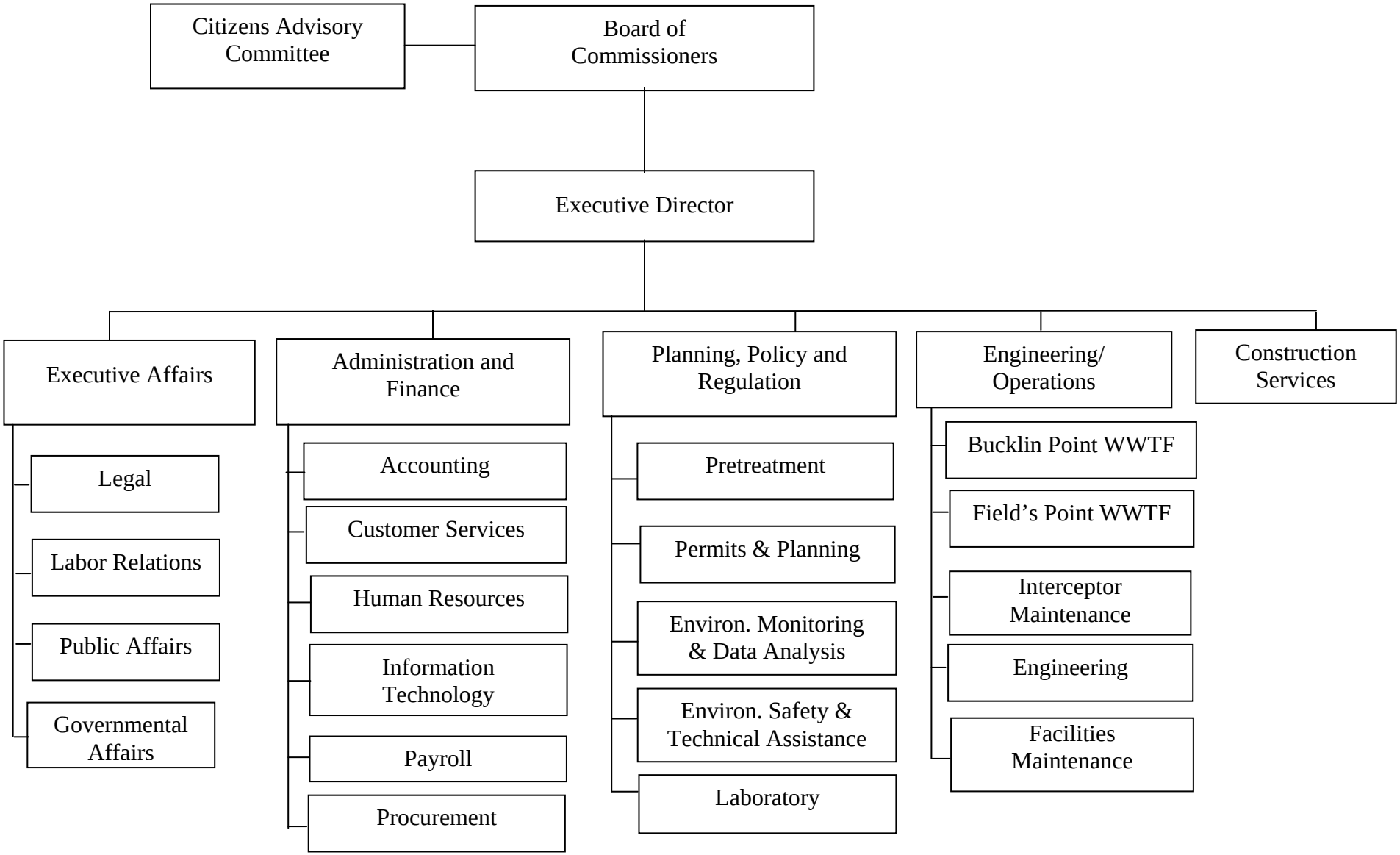
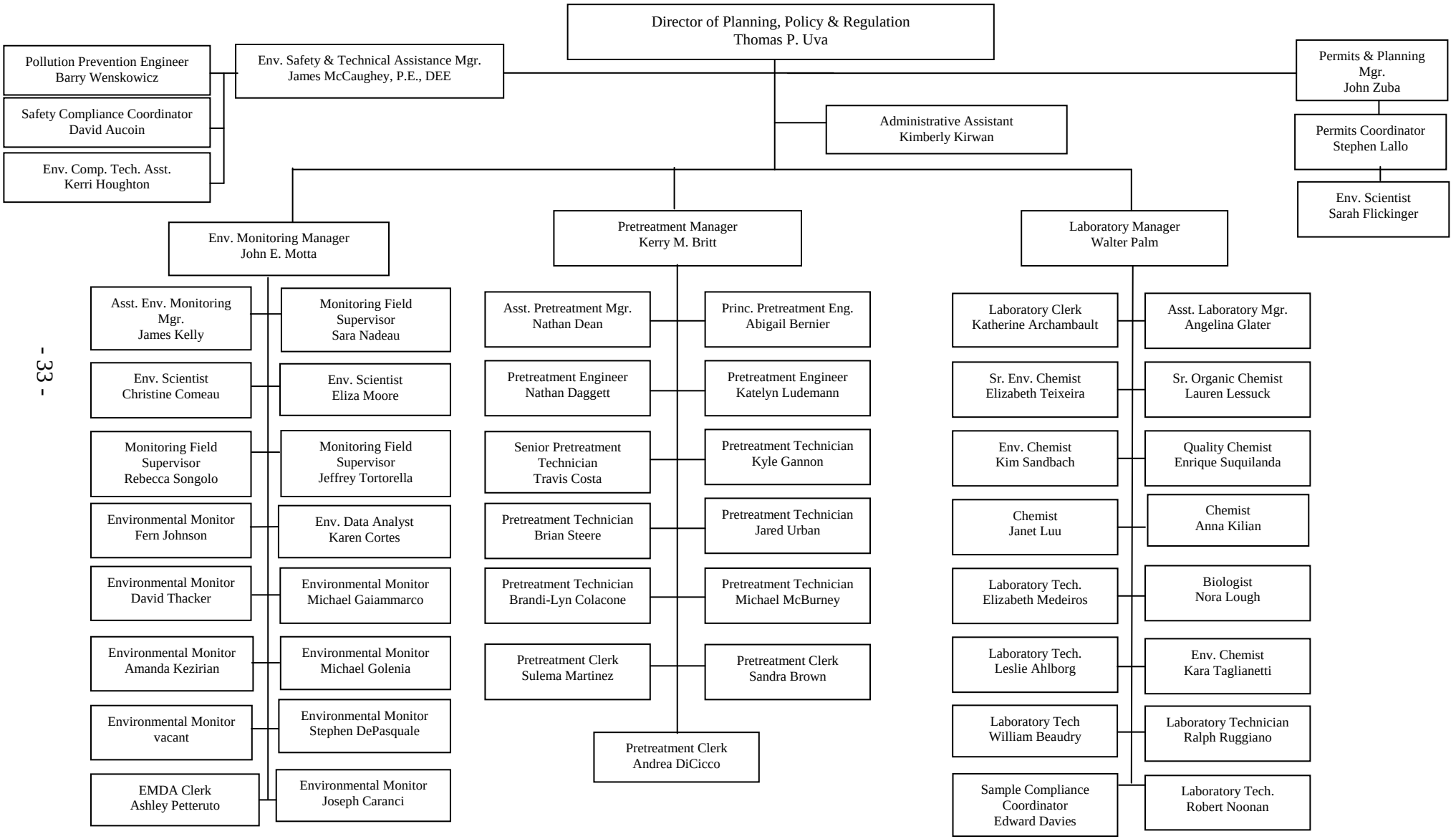


FIGURE 3
Narragansett Bay Commission
Division of Planning, Policy & Regulation
March 15, 2017



During 2016 there were three personnel changes in the Pretreatment Section. The first change occurred in January when Brandi-Lyn Colacone filled the Pretreatment Technician position vacated in late 2015. The second change occurred in March when Andrea DiCicco filled the Pretreatment Clerk position which was vacated in late 2015. The third change occurred in July when Ian Jardin vacated his Pretreatment Engineer position for a position in the private sector. The vacant Pretreatment Engineer position was filled by Katelyn Ludemann in October.

There were two personnel changes in the EMDA Section during 2016. In January Brandi-Lyn Colacone vacated her EMDA Data Assistant position to take a position in the Pretreatment Section. The Data Assistant position was reevaluated. The reevaluation determined the duties and responsibilities should be revised. This position was changed to incorporate additional training and responsibilities and the title was changed to Environmental Data Analyst. This position was filled by Terri Breeden in April. Terri Breeden vacated the Environmental Data Analyst position in June for a position in the private sector. Karen Cortes filled this vacant position in September.

There was one personnel change in the ESTA Section during 2016. Kerri Houghton vacated her Laboratory Technician position and filled the vacant Environmental Compliance Technical Assistant position in May.

There were two personal changes in the Laboratory Section in 2016. The first occurred in May when Kerri Houghton vacated her Laboratory Technician position for a position in the ESTA Section. This vacant Laboratory Technician position was filled by Elizabeth Medeiros in June. The second change occurred in June when Ryan Sullivan vacated his Quality Chemist position for a position in the private sector. Enrique Suquilanda filled this vacant Quality Chemist in October.

There was one personnel change in the Permits & Planning Section during 2016. Pamela Reitsma vacated her Environmental Scientist position in July. This vacant position was filled by Sarah Flickinger in October.

Staff Training

The NBC provides extensive training to its employees and has a tuition reimbursement program to assist employees in furthering their education. During 2016, staff received training by attending seminars, workshops and classes in many areas including safety, technical and office productivity.

The NBC places a high value on the safety of its employees. Therefore safety training is provided to all personnel and in many cases this training is mandatory for certain positions. The following lists the safety trainings provided in 2016:

- CPR/AED
- Environmental Health & Safety Awareness
- HazCom/Right-to-Know Training
- New Employee Safety Training
- Personal Protective Equipment
- Healthy Back, Slips, Trips and Falls
- Occupational Hearing Safety
- Permit Required Confined Space
- First Aid Training
- Man Overboard Training
- Work Zone Safety
- Emergency Preparedness Plans
- Air Monitor Equipment Training
- Voluntary Respirator Training
- Supervisor Safety Awareness Training

To ensure that staff can adequately perform their job functions, specialized technical training is provided. Staff often suggests topics for training. The following is a list of the technical trainings provided to Pretreatment, EMDA, ESTA and Laboratory personnel during 2016:

- 40-Hour HAZWOPER Training
- Enforcement Response Plan Training
- 8-Hour HAZWOPER Refresher Training
- Thermaco Grease Removal Equipment Training
- Basic Laboratory Training
- Spill Tracking Training
- Pretreatment System Data Entry
- Reading Sewer Maps
- Discussing Compliance Issues with Users
- Split Sample Data
- Issuing Notices of Violation for Non-Notification of Violations
- Photo Ionization Detector Training
- Dealing with Request to Discharge on an One Time Basis
- Industrial Flow for SIU Classification
- Pretreatment Software Training
- Impacts of Metal Finishing Wastewater on the Sewer System
- pH Neutralization System Training
- Four Gas Meter Training
- ICP-MS Training
- OSHA Respiratory Protection
- NBC Fish Kill Response Standard Operating Procedures

PP&R staff is encouraged to attend conferences and workshops to educate themselves on current and emerging issues in the wastewater and environmental fields. The technical conferences and workshops that were attended in 2016 are as follows:

- 2016 New England Regional Pretreatment Coordinators Conference
- 2016 National Association of Clean Water Agencies Pretreatment & Pollution Prevention Conference
- 2016 NEWEA Conference
- Protecting Wastewater Workers from Infectious Disease Risks
- RI Commerce – Statewide Action Team Training
- NEWEA Spring Conference
- Benthic Ecology Conference
- Biodiesel Seminar
- RI Bays Rivers & Watershed Coordination Team Workshop
- 2016 PITTCON Conference
- Hospital Hazard Vulnerability
- NEWEA Specialty Seminar on Engineering Technology
- Harmful Algae Bloom Seminar
- ACEEE Conference
- New England Estuarine Research Society Fall Meeting
- Annual Renewal Portfolio Standard Summit
- Put a Meter on it: The Why and How of Sub-Metering Energy Webinar
- Water Use in Buildings, Data Centers and Facilities Webinar
- California Renewable Portfolio Standard Webinar
- Materials Research Society Fall Exhibition
- National Summit on Renewable Portfolio Standards
- Upgrading Digester Biogas to Pipeline Quality Webinar
- New Hampshire Renewable Energy Standard Webinar
- Biodiesel Seminar
- RI Energy Forum
- Managing Risk and Resiliency Conference
- Principals of Ergonomics
- National Grid Workshop on Waste Heat Recovery
- National Grid Workshop on Variable Frequency Drivers

The NBC provides 40-Hour HAZWOPER training to all new Pretreatment, ESTA and EMDA personnel. The 40 hour training program is required by OSHA of all emergency response personnel that may be first responders to chemical spills or who may work at hazardous waste sites. This training includes hands-on use of Self-Contained Breathing Apparatus (SCBA) equipment, respirators, personal protective equipment, air and water monitoring equipment, etc. Staff members were instructed in First Aid, CPR, confined space entry, hazardous waste handling, toxicology and spill and hazardous waste site control and coordination.

An eight hour HAZWOPER recertification training session is provided annually to Pretreatment, EMDA, ESTA and Laboratory personnel that have previously completed the 40 hour HAZWOPER training program. The eight hour recertification training session is required by OSHA annually as a refresher class. The recertification program covers many topics, such as incident command, confined space entry, spill tracking, boom deployment, personal protective equipment, use of air monitoring equipment, CPR/AED and first aid.

In order to ensure productivity remains efficient and of high quality, staff participate in many administrative trainings. The trainings that staff participated in during 2016 are as follows:

- Excel
- Word
- Windows 7
- Managing Multiple Projects, Objectives & Deadlines
- Sexual Harassment
- Infotech-Training Central
- Communicating with Tact, Diplomacy & Professionalism
- Oracle Financial Systems Training
- Hanson Software Training
- Share Point 2010 Documents
- Service Desk
- Web and Internet Email
- Intercom Training
- Arc GIS Training
- Mistake Free Grammar and Proofreading

The NBC provides a tuition reimbursement program to encourage its employees to further their education. The college courses that staff attended during 2016 are as follows:

- Community Ecology
- Correlating the Effects of Weather and Catch
- Ecohydrology
- Ecological Statistics
- Environmental Law
- Fisheries Science
- HAZWOPER
- Introduction to Global Issues in Sustainability
- Masters Environmental Science and Management Seminar
- National Marine Monument in the Atlantic Ocean -credited paper

In addition to attending trainings, workshops and seminars, PP&R staff also provide technical training for other sections of the NBC as well as assist other agencies with developing and training on inspection skills. The following trainings were conducted by PP&R staff in 2016:

- Kerry Britt, Pretreatment Manager, and John Zuba, Permits & Planning Manager conducted the required annual Spill Prevention, Control & Countermeasures/Storm Water Management Plan training in May and December respectively to Bucklin Point and Field's Point treatment plant personnel.

- During 2016 the Pretreatment Section assisted in the training of the new Pretreatment Coordinator for the South Kingstown. She shadowed staff on inspections of industrial and commercial facilities.

Throughout 2016, PP&R staff mentored high school students from across the state. They were educated on the responsibilities of each section and were also assisted with science fair projects.

NBC Toxics Reduction, Control and Monitoring Program Budgets

The NBC is committed to protecting the two wastewater treatment facilities and Narragansett Bay from toxic discharges. This pledge to protect the environment is evidenced by NBC continued commitment to ensure adequate staffing and funding levels for the PP&R Division as necessary to ensure environmental protection. The PP&R Division budget for fiscal year 2017 (FY17) was $6,413,673. The FY17 PP&R Division budget allocated $5,079,106 or 79.2% to personnel costs.

The approved FY17 Pretreatment budget was $1,191,005, an increase of 6.6% from the FY16 budget of $1,116,861. The FY17 Pretreatment budget allocated 94.3%, or $1,122,685, to personnel costs.

The budget for the EMDA Section in FY17 was $1,748,357 of which 80.4% or $1,405,307 was attributed to personnel expenses. The FY17 EMDA budget increased by 2.7% from the previous year.

The ESTA budget for FY17 was $423,153, an increase of $31,623 from the FY16 budget of $391,530. The approved FY17 Laboratory budget was $2,375,800 an increase of 7.0% or $156,427 from the previous year. The approved FY17 Permits & Planning budget was $675,358. Personnel costs associated with the ESTA, Laboratory and Permits & Planning Sections budgets were 91.3%, 67.7% and 82.4% respectively.

In 1983, the R.I. General Assembly passed Public Law 1983, Chapter 235 which required that the NBC begin direct billing of sewer users effective July 1, 1985 and that all sewer use rates be subject to review and approval by the RI Public Utilities Commission (PUC). On July 1, 1995, a new permit fee rate structure approved by the PUC became effective to ensure recovery of Pretreatment costs. These rates were increased in 2003 in accordance with a PUC Rate hearing. This permit fee rate structure is provided in CHAPTER III.

Pretreatment Information Management Computer System

The Pretreatment software system that was completely developed in-house by the NBC Information Technology (IT) Section and was put on line during 2004. User Wastewater Discharge Permits and Zero Process-Sanitary Discharge Permits are uploaded to the Pretreatment System and can be viewed on all desktop computers. The software also allows entry of photographs of users sampling locations, pretreatment systems and surveillance manholes to be uploaded to the system. The Laboratory purchased and implemented a new Laboratory Information Management system (LIMS) in 2012. IT staff wrote a program to ensure LIMS would interface with the Pretreatment system to ensure there was no loss in data transfer. The Pretreatment System also interfaces with the Customer Service software which was also developed by NBC IT Staff.

During 2016 Pretreatment and IT staff worked on upgrading the Pretreatment software system. The upgrade improved the functionality and efficiency. The upgraded system can be fully accessed on the iPads. This allows staff to view user data and permits in the field. In addition staff can access mapping apps directly from the software. During 2017 Pretreatment staff will continue to work with IT to further enhance the system. These enhancements include pages to track manhole data, grease control program data and industrial area inspection data.

The Pretreatment software system was developed to track the requirements specified by the DEM in the RIPDES permits issued to the NBC. The Pretreatment software package has the following capabilities:

- Ability to track users in multiple drainage districts with different local limits and analyze the user data either separately or collectively.

- Ability to create a file for each user containing information pertinent to the user such as company name, address, permit number, company contacts, compliance status, solvents and chemicals used, user classification, user category, water usage, permit history, inspection history, the key manhole that the user discharges to, sample locations, monitoring requirements, reporting requirements, etc.

- Automatically generate form letters, based on data entered into the system, to notify users that are not meeting standards or have failed to submit monitoring results and certifications.

- Subroutines that summarize compliance monitoring and other user requirements and print the data in a format suitable for inclusion in the annual report.

- Maintain a user requirements file for tracking of user compliance with administrative orders, compliance schedules, submittal due dates, and other requirements that are issued to users to ensure that user requirements are met on time. Notices of Violation are generated automatically to notify the user of noncompliance with specified deadlines.

- Ability to maintain files of NBC and EPA pretreatment standards and compare monitoring results with these standards to automatically generate a Notice of Violation form letter notifying user of Failure to Meet Standards.

- Subroutines to review monitoring data to determine a user's compliance with standards for any time period specified. These subroutines are used to determine the "List of Firms in Significant Non-Compliance" for exceeding discharge standards 66% of the time or the EPA TRC value of 1.2 times the standard for metals and cyanide and 1.4 times the standard for oil and grease 33% of the time.

- Ability to send out mailings to specific users or various categories or classifications of users to notify them of changes in standards, requirements, etc.

- Subroutines that allow input, output, tracking and maintenance of a list of all inspections performed and the type of the inspection conducted for any specified reporting period.

- Ability to run an "EPA Counts" program that will review and analyze all user data for any specified time period and print out pertinent data that must be routinely reported to the EPA and the local control authority.

- Subroutines that track worker performance, such as number of inspections and meetings conducted, permits written, number of active assigned users, and the number of days required by the worker to process user submittals.

- Ability to enter industrial and sanitary manhole monitoring data and create reports based upon this data.

- Ability to track and print out any changes in user classification from significant to non-significant status or vice versa, the date of the change, and the engineer that made the change.

- Ability to print out a report of all companies with the number of batch, non-batch, and pH violations for any specified reporting period.

- Ability to print out a list of all companies indicating the number of months since the last sampling or non-sampling inspection.

- Subroutines that track the number of user parameter violations and analyze and track pollutant loadings for various classes of users.

In 2013 iPads were purchased for Pretreatment technical staff. The purpose of using this technology is to improve efficiency throughout the inspection process. Pretreatment staff continued to use inspection checklists developed for the iPad during 2016. These checklists are completed in the field and downloaded to SharePoint so that the documents can be efficiently processed at the office for inclusion in the user file. With the use of the iPad, staff can now take pictures in the field and email them to supervisors back in the office as well as being readily attached to the inspection reports.

Public Information and Education Methods

One of the most effective means of ensuring user compliance is through continued user education regarding environmental problems, NBC programs and ever-changing regulations. The NBC is committed to user education and public information. The NBC Public Affairs Office, in conjunction with the staffs of the ESTA and Pretreatment Sections continually inform users of various NBC activities. The NBC uses several means for providing public education about the goals, requirements, and accomplishments of the NBC source reduction and control programs. These include the following:

- Mailings to users informing them of pretreatment requirements;
- Newspaper and Magazine Articles, Public Notices, and various NBC newsletters;
- Development and distribution of educational fact sheets and technical bulletins;
- Public Meetings, Workshops, and Hearings;
- Displays at Public Events;
- Social Media outlets, such as Facebook, Twitter and YouTube;
- The NBC Citizens Advisory Committee.

During the past twelve months, the NBC used all of these means to keep users and the community informed of the requirements, activities and accomplishments of the NBC source reduction and control program. Activities in each of the above-listed categories are described in the following paragraphs.

Mailings

During 2016, the NBC sent ten informational letters to various categories of regulated users located in the two districts. TABLE 7 below describes each of these informational letters.

TABLE 7
2016 Informational Letters

Issue Date	Description
January 4, 2016	This letter was issued to all permitted septage haulers to transmit vehicle identification stickers and notify them discharges would not be permitted without a valid sticker.
February 22, 2016	This letter was sent to all permitted users announcing the 21th annual Environment Merit Awards and invited them to nominate themselves for an award.
March 3, 2016	This letter was issued to all SIUs congratulating the 19 companies that achieved perfect compliance for the 2015 review period.
March 8, 2016	This letter was issued to all SIUs notifying them they were classified as SIUs during 2015. This letter reminded these companies of the reporting requirements outlined in 40CFR§403.12.
March 11, 2016	This was issued to all users who were published in the Providence Journal on February 23, 2016 for being in Significant Non-Compliance (SNC) for the reporting period of October 1, 2014 through December 31, 2015. An invoice for their portion of the cost publish the notice was included with the letter.
March 17, 2015	This letter was issued to all industrial users and notified them of EPA SNC criteria used by the NBC and outlined permitting and reporting requirements.
June 6, 2016	This letter was sent to all industrial users notifying them prohibited substances should not be discharged to the sewer system during summer shut down and clean-up operations. The letter warned users that civil and criminal penalties would be strictly enforced against violators caught illegally dumping.
October 3, 2016	This letter was issued to facilities utilizing #4, #5, or #6 fuel oil. The letter recommended the companies to inspect their heating systems prior two seasonal start-up of their heating systems to prevent accidental releases of fuel oil to the sewer.
November 21, 2016	This letter was sent to all industrial users notifying them prohibited substances should not be discharged to the sewer system during the holiday shut down and clean-up operations. The letter warned users that civil and criminal penalties would be strictly enforced against violators caught illegally dumping.
December 28, 2016	This letter was issued to all permitted septage haulers to transmit vehicle identification stickers and notify them discharges would not be permitted without a valid sticker.

Newspaper and Magazine Articles, and Public Notices and the NBC Newsletter

The NBC routinely issues press releases on its activities and discusses events relating to pretreatment and other environmental matters with reporters. Articles pertaining to the NBC have appeared in newspapers and magazines over the past year relating to:

- Educational workshops, meetings and articles by the ESTA and Pretreatment Programs;
- Articles regarding NBC personnel;
- NBC Progress on Combined Sewer Overflow (CSO) project;
- Public and community outreach projects;
- Capital Improvements for NBC facilities;
- Water Quality;
- Permitting Issues;
- NBC Energy Projects.

Copies of each of the aforementioned newspaper and magazine articles are provided in ATTACHMENT VOLUME I, SECTION 1. The NBC also published numerous Public Notices regarding the following topics:

- Public Notice listing the names of firms in Significant Non-Compliance;
- Public Notice listing the names of Significant Industrial Users in Perfect Compliance;
- Public Notice announcing the NBC Environmental Merit and Regulatory Compliance Award winners;
- Public Notices of Rate Filing and Public Hearings regarding various NBC projects and informational meetings.

In addition to public notices, newspaper and magazine articles, the NBC also publishes notices requesting proposals and qualifications, issues press releases, publishes bill inserts which are sent to all permitted users, and develops educational brochures and fact sheets. The NBC bill inserts inform the users of various NBC activities including: improvements at the treatment facilities, billing activities, reductions in toxic loadings, water conservation, and pollution prevention. Copies of the 2016 public notices and NBC newsletters are included in ATTACHMENT VOLUME I, SECTION 1.

Public Relations & Outreach Events

Public participation and outreach has played an essential part of fulfilling the challenging goal of increasing public awareness and understanding of wastewater treatment. A summary of this year's highlights include:

- *Facility Tours* - In 2016, over 2,000 visitors took complimentary tours of the NBC wastewater treatment facilities. These visitors ranged from school children to university students to engineers. To make the tours even more accessible to area students, the NBC offered school bus scholarships to help defray transportation costs for schools in the NBC service district.

- *Maintaining a Presence on the World Wide Web (**www.narrabay.com**)* - To further improve communications with our customers, the NBC continued to enhance its website. Performance Statistics relating to the NBC Combined Sewer Overflow (CSO) and wind turbine projects are regularly updated on the site. Full documentation of the re-evaluation stakeholders process for Phase III of the CSO Project was published on the website as well. The NBC continued weekly updates of its award-winning water quality website "Snapshot of Upper Narragansett Bay". This website contains fact sheets, monitoring and data reports regarding water quality. The public is able to easily download all NBC receiving water monitoring data. The NBC also continued populating its Facebook page and Twitter and Instagram feeds and joined other organizations across the globe to "Imagine a Day Without Water" on September 15, 2016 with a web-based video on the importance of clean water infrastructure in our daily lives.

- *Advocacy for Clean Water* - In 2016, the NBC worked with over 1,600 wastewater treatment facilities nationwide to advocate for federal funding for clean water infrastructure. The NBC Executive Director assumed the role of President of the National Association of Clean Water Agencies (NACWA), giving the NBC a unique opportunity to communicate directly with the Rhode Island Congressional delegation, presenting the municipal perspective on infrastructure needs for the next two decades and the importance of an affordable and sustainable solution to our clean water requirements.

- *Teaching Children About Water Conservation and Wastewater Treatment* - During 2016, the NBC continued to work with area schools to educate children about the impacts of pollution on water quality. During the year the NBC worked with twelve schools and 700 students. The program named NBC Watershed Explorers Program, involved monthly classroom visits, journal writing and awarding student achievement badges. In 2007, the program won a national public education award from the NACWA.

- *Celebrating the Importance of Narragansett Bay* - For the twenty-second year, the NBC sponsored its annual poster contest for elementary school students in kindergarten through sixth grade. Over 600 students enthusiastically illustrated clean water themes with colorful, original depictions of the importance of our water resources. Winners received a prize and had their artwork showcased in a 2017 calendar. In addition, the winning posters were exhibited at the Fields Point WWTF Education Center.

- *Recognizing Students for Environmental Awareness* - For the twenty-fourth consecutive year, the NBC has participated in the Rhode Island State Science and Technology Fair and presented prizes to those junior and senior high school students who best demonstrate how to achieve a cleaner Narragansett Bay.

- *Student Internships* - The NBC continued its tradition of opening its doors to provide experiential education opportunities for local high school and college students. This year, students gained practical hands-on experience in areas as diverse as wastewater treatment operations, planning, and environmental monitoring and data analysis.

- *Career Opportunities Outreach* - Through the efforts of the NBC Affirmative Action Committee, the NBC delivered career day presentations to students in Cumberland and Providence. The NBC also held its first STEM Career Day for high school students to encourage careers in clean water science and engineering.

- *Supporting Community Programs* - Each year, the NBC solicits funding ideas from employees and the public for the monies collected from environmental violators. This year, 20 community organizations were awarded Earth Day clean-up grant funds to support local efforts.

- *Honoring Industrial and Commercial Users for Environmental Performance* - This year, the NBC recognized twenty companies in the service district with Environmental Merit Awards for Storm Water Management and Perfect Compliance Awards with regulatory requirements. In 2016, the NBC continued its program to recognize firms that implement storm water management plans and minimize storm flow to the sewer. The environmental strides made by these companies were honored at a special breakfast. Additional information regarding this program is provided in CHAPTER VII.

- *Keeping Our Stakeholders Informed* - The NBC Facebook page, Twitter feed and Instagram continue to offer up-to-the-minute information on construction, water quality monitoring, and public events. In addition, the NBC continued to make available its 22-minute DVD about the CSO Project, entitled *The Biggest Project You'll Never See* and the 30-minute DVD about the NBC *Environmentalism at Work.* The DVDs are available free to the public.

- *Celebrating the Connection Between Clean Water and Green Energy* – In 2016, the three NBC 1.5 megawatt wind turbines produced 47% of the power needed to operate the Field's Point Wastewater Treatment Facility. The 365-foot tall turbines serve as a visual reminder to all Rhode Islanders of the NBC leadership in sustainable energy and clean water. Also during 2016, the NBC purchased three additional 1.5 MV wind turbines. These turbines are remotely located off NBC property in Coventry, Rhode Island.

- *Bi-lingual Information* – During 2016, the NBC continued distributing Spanish language versions of its billing and collections information.

- *Casual Days* - Throughout the year, the NBC continued to participate in a casual day program. The proceeds benefited various local and state organizations, such as the Multiple Sclerosis Society of Rhode Island and The Red Cross.

- *State Employee Charitable Appeal* - NBC employees participated in the 2016 State Employees Charitable Appeal (SECA) and raised over $16,000 for a host of worthwhile, appreciative charitable organizations.

NBC Speakers Bureau

The NBC has a well-established Speakers Bureau to address the many requests received to speak at schools, workshops and meetings, both locally and nationally. During 2016, NBC personnel gave many presentations to educate public and professional organizations about the NBC and its many programs and accomplishments. The following paragraphs detail these activities:

Pretreatment Presentations

~National Association of Clean Water Agencies (NACWA) Pretreatment Pollution Prevention Conference

The 2016 NACWA Pretreatment and Pollution Conference was held in Long Beach, CA on May 17 through 20, 2016. On May 19, 2016 Kerry Britt, Pretreatment Manager, gave a presentation on the NBC Enforcement Response Plan and the Outcome of the 2015 Pretreatment Compliance Inspection. In addition, she served as a facilitator during a round table discussion on Enforcement and Awards Programs.

~DFI-EP, LLC

On October 25, 2016 Kerry Britt, Pretreatment Manager, gave a presentation to the employees of DFI-EP, LLC, located in North Providence, on the impacts of pollutants generated from metal finishing operations on the sewer system.

~New England Regional Pretreatment Coordinators Association (NERPCA) Conference

The 18th Annual NERPCA Conference was held on October 26 and 27, 2016 in Chelmsford, MA. During the conference Kerry Britt, Pretreatment Manager, she facilitated two roundtable discussions and led the NERPCA business meeting.

~Women is Science and Engineering (WISE) Workshop

On November 6, 2016 Kerry Britt Pretreatment Manager, participated in the 2016 Women in Science and Engineering (WISE) workshop held at St. Mary Academy-Bay View. Over 100 Middle School aged girls attended the workshop. The presentation included and overview of the NBC, the Pretreatment Program and what not to flush. An experiment showing the breakdown of toilet paper versus cleaning wipes and baby wipes was conducted. They were also shown how bacon grease can impact the sewer system. The girls conducted analyses on nitrogen, phosphate, dissolved oxygen and pH.

Bacon Grease Separating

Toilet Paper, Baby Wipe, Cleaning Wipe being agitated

Water Quality Presentations

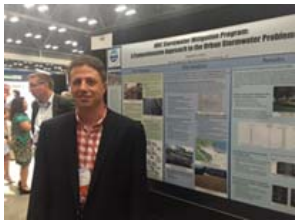
~Environmental Monitoring Stakeholders

On March 17, 2016 and April 13, 2016, Tom Uva, Director of PP&R gave presentations on NBC monitoring activities, NBC construction projects and the water quality improvements observed as a result of wastewater treatment plant upgrades at a meeting of environmental stakeholders.

~Benthic Ecology Conference

On March 17 and 18, 2016 Christine Comeau and Eliza Moore, Environmental Scientists, presented a poster on data and goals from the NBC benthic video monitoring program at the Benthic Ecology Conference.

~NEWEA Spring Conference



On June 7, 2016 Stephen Lallo, Permits Coordinator, gave a presentation on the NBC Storm Water Management Program at the NEWEA Annual Spring Conference.

~SmartCities Innovation Summit Conference

During the SmartCities Innovation Summit conference held on June 13, 2016 through June 15, 2016. Stephen Lallo, Permits Coordinator, presented a poster on the NBC Storm Water Management Program.

~Save the Bay

On August 9 2016 Christine Comeau, Environmental Scientist, discussed NBC monitoring programs and the water quality of Narragansett Bay with high school students attending a summer camp at Save the Bay.

~NACWA Utility of the Future Webinar

On September 15, 2016, Tom Uva, Director of PP&R gave a presentation on NBC initiatives addressing climate change during a NACWA Utility of the Future webinar.

~New England Estuarine Research society (NEERS)

On October 21, 2016 Christine Comeau and Eliza Moore, Environmental Scientists, gave presentations at the annual NEERS conference. The presentations were on the NBC Combine Sewer Overflow Abatement Project and the NBC Nitrogen Reduction Efforts and their Impacts of Nitrogen on the Bay.

Energy Presentations

~United States Department of Energy (USDOE)

On March 24, 2016 Barry Wenskowicz, Pollution Prevention Engineer, gave a presentation on the Bucklin Point UV Disinfection System during an USDOE Webinar.

~Rhode Island NPR

On June 29, 2016, Tom Uva, Director of PP&R was interviewed by Rhode Island NPR on the NBC energy initiatives.

~Water Conservation Education Programs

The NBC makes great efforts to educate its users about water conservation. The NBC has a Non-Regulatory Water Audit and Technical Assistance Program, which is available free to its commercial and industrial sewer users. Additional information about this program is provided in CHAPTER VII.

Due to the success of the pilot program, the NBC expanded the What's in Your River program in the fall of 2003 to accommodate the overwhelming school response. The NBC improves the program each year. In 2005, What's In Your River became the Woon Watershed Explorers Program, and an expanded version of the program continued throughout 2014. The program was re-branded in 2015 as the NBC Watershed Explorers and includes several new components including classroom visits once a month, student achievement badges and journal writing. Over seventeen schools and 6,000 students have participated. The most impressive characteristic of the program is the extreme diversity represented in each school. Some students have never taken a field trip to their local river, while others live adjacent to one.

The program encourages each school to take ownership of their local rivers and to pass on messages about clean water to their fellow students, families and neighbors. The Narragansett Bay Commission considers this program to be imperative to its success in its relentless pursuit of public outreach and education. Twelve schools and over 700 students participated in the program in 2016.

Citizen's Advisory Committee

The NBC has a permanent Citizens Advisory Committee (CAC) established as part of its organizational structure. The CAC meets monthly and is routinely informed of NBC activities by staff. The CAC serves to advise and assist the NBC in its dealings with the public. Its members consist of representatives of the industrial community, environmental advocacy groups, and concerned citizens. Pretreatment staff made the annual presentation to the Citizens Advisory Committee on April 20, 2016 to review the progress and achievements of the Pretreatment Program during the prior year.

Professional Affiliations

The NBC has affiliated itself with many professional groups and organizations, both locally and nationally, to learn from these groups and to educate them about the NBC. The NBC is a member of the Providence Chamber of Commerce, the Northern Rhode Island Private Industry Council, the National Association of Clean Water Agencies (NACWA), New England Water Environment Association (NEWEA), the Water Environment Federation, American Electroplaters & Surface Finishers Society, and the American Academy of Environmental Engineers, to name a few. Various NBC staff routinely attends association meetings and conferences and often are speakers at such events.

III. INDUSTRIAL AND COMMERCIAL USERS, PERMITS, AND INSPECTIONS

User Classification System

Since the inception of the Pretreatment Program, the NBC has identified and inspected 8,197 different industrial and commercial users located within the two NBC sewer districts. During 2016 the Pretreatment staff identified and entered information on 169 previously unknown users into the NBC Pretreatment database. Pretreatment users are categorized according to the classification system shown in TABLE 8. This classification system categorizes users in nine general categories. Each class of users is subdivided into more specific classes of users. Firms classified by the Pretreatment Section as industrial facilities may be listed in Categories 1 through 7, while commercial facilities can be classified in Categories 5 through 9. Users in Categories 1, 2 and 3 are of primary concern to the NBC Pretreatment Section as their discharges contain toxic and conventional pollutants that can have an impact on NBC facilities. Category 4 consists of users with the potential to discharge toxics. Category 5 users may have non-toxic discharges such as cooling water. Category 6 users have no discharges or potential for discharge to the sewer and Category 7 users have gone out of business or moved out of the district. Commercial users with the potential to discharge conventional pollutants are classified in Category 8, while commercial users with the potential to discharge toxic or prohibited pollutants are listed in Category 9.

Significant Industrial Users

In 1995, the NBC standardized its definition of Significant Industrial User (SIU) in both districts by modifying the NBC Rules and Regulations. This definition was essentially an adoption of the Field's Point SIU definition, and classifies a SIU as any industrial user that satisfies any one of the following criteria:

- Firm is subject to Federal EPA categorical standards;
- Firm discharges an average of 5,000 or more gallons per day of process waste water;
- Firm contributes a process waste stream which makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the NBC's Treatment Plant;
- Firm is designated as significant by the NBC on the basis that the user has reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement.

TABLE 8
NBC User Classification System
Industrial User Categories

Category 1: Industries subject to Federal EPA Categorical Standards.

10. Other Categorical Users
11. Electroplaters, Metal Finishers
12. Metal Molding and Casting
13. Organic/Inorganic Chemical Manufacturers
14. Pharmaceutical Manufacturers
15. Metal Formers
16. Steam Electric Power Generators
17. For Future Use
18. Centralized Waste Treatment Facilities
19. Transportation Equipment Cleaning

Category 2: Industries discharging toxic and/or prohibited pollutants, but who are not subject to Federal EPA Categorical Standards.

20. For Future Use
21. Tubbing/Vibratory/Mass Finishing
22. Chemical Transporters, Refiners, Recyclers, Manufacturers
23. Textile Firms
24. Printers
25. Industrial Laundries
26. Machine Shops/Machinery Rebuilding
27. Other Facilities discharging toxic and/or prohibited pollutants
28. Central Treatment Facilities - Hazardous Waste
29. Central Treatment Facilities - Non-Hazardous Waste

Category 3: Industries discharging or having the potential to discharge conventional pollutant (BOD, TSS, pH, oil and grease, fecal coliforms) loads in sufficient quantities to cause violation of RIPDES permit or local discharge limitations.

30. For Future Use
31. For Future Use
32. For Future Use
33. For Future Use
34. Manufacturers with high BOD/TSS waste
35. Other Facilities Discharging Conventional Pollutants
36. For Future Use
37. Automotive Maintenance/Service Facilities
38. For Future Use
39. For Future Use

TABLE 8
(Continued)
NBC User Classification System
Industrial User Categories

Category 4: Industries with sanitary or non-toxic discharges using solvents, toxic and/or hazardous chemicals that could potentially be discharged to the sewer.

40. Groundwater Remediation/Excavation Projects
41. Recycled or Disconnected Electroplating or Chemical Processes
42. Other Process Operations that are Disconnected or Recycled
43. Recycle Electroplating or Chemical Processes with Non-contact Cooling Water or Boiler Discharges
44. Other Recycled or Disconnected Processes with Cooling Water, Boiler, or other Discharges
45. For Future Use
46. Cooling Water Discharges with Solvents, Toxic and/or Hazardous Chemicals on site
47. For Future Use
48. For Future Use
49. Other Discharges with Solvents, Toxic and/or Hazardous Chemicals on site

Category 5: Industries discharging only sanitary wastes and/or non-toxic discharges.

50. For Future Use
51. Cooling Water
52. Boiler Blowdown/Condensate Discharges
53. Cooling Tower Discharges
54. For Future Use
55. For Future Use
56. For Future Use
57. For Future Use
58. For Future Use
59. Other Non-Toxic Industrial Discharges

Category 6: Dry industries with no wastewater discharges to the sewer using solvents, toxics and/or hazardous chemicals.

60. All users

TABLE 8
(Continued)
NBC User Classification System
Commercial User Categories

Category 7: Industries with no waste discharges to the sewer.

70. Septic System Discharger
71. Out of Business
72. Moved out of the District
73. Permit Expired/Not Renewed or Reissued
74. Proposed Discharges - Permit Not Issued
75. Accidental Discharges/Spills/Non-Permitted Discharge

Category 8: Commercial Users with the potential to discharge conventional pollutants (BOD, TSS, pH, oil and grease, fecal coliforms) loads in sufficient quantities to cause violation of RIPDES permit or local discharge limits.

80. Septage Haulers/Dischargers
81. Food/Fish/Meat Produce Processing (Wholesale)
82. Supermarkets (Retail Food Processing)
83. Parking Garages/Lots
84. Cooling Water/Groundwater/Boiler Discharges
85. Restaurants/Food Preparation Facilities
86. Commercial Buildings with Cafeteria and/or Laundry Operations
87. For Future Use
88. For Future Use
89. Other Commercial Facilities with Potential to Discharge Conventional Pollutants

Category 9: Commercial Users with the potential to discharge toxic substances, prohibited pollutants and/or conventional pollutants.

90. Hospitals
91. Cooling Water/Groundwater/Boiler Discharges
92. Laundromats/Dry Cleaners
93. Photo Processing
94. X-Ray Processing
95. Clinical, Medical, and Analytical Laboratories
96. Funeral Homes/Embalming
97. Motor Vehicle Service/Washing
98. For Future Use
99. Other Commercial Users with Potential to Discharge Toxic, Prohibited and/or Conventional Pollutants.

A list of the industrial and commercial users, separated by district, is provided in ATTACHMENT VOLUME II, SECTION 1. The users' category and designation as significant or non-significant is also provided in this listing. As of the date of submission of this report 8,197 industrial and commercial users have been identified through user surveys, 5,554 are still conducting business in the NBC service areas and 71 were classified as SIUs sometime during 2016. Of the 71 SIUs reported for 2016, there were 46 classified as categorical industries which are subject to both NBC and EPA regulations, and 25 significant non-categorical industrial users of the NBC sewer system. During this reporting period, two SIUs were reclassified to non-significant due to operational changes implemented within their facilities. These operational changes may range from installation of a wastewater recycle pretreatment system to the firm going out of business or moving out of the NBC district. Two firms were newly classified as significant during 2016. A listing of these firms, detailing the specific reason for reclassification, is provided in CHAPTER I.

Wastewater Discharge Permits

As of the date of this submission, the NBC has 1,725 Wastewater Discharge Permits in effect, which were issued to facilities located in the Field's Point and Bucklin Point drainage districts. Presently, 1,165 permits are in effect for users in the Field's Point district, while 560 permits are in effect in the Bucklin Point district. Discharge permits which are no longer in effect may have been terminated for one of the following reasons:

- The permit expired, was revised, and reissued.
- The firm has gone out of business (Category 71).
- The firm has moved out of the NBC District (Category 72).
- The firm's Wastewater Discharge Permit was terminated and reissued in a new classification to reflect operational changes.
- The firm has ceased process discharge to the sewer system (Categories 41, 42, 43, 44, 60 or 73).

TABLE 8 provides a summary of the number of permits issued and presently in effect by category of user for each district. Permits have been issued and are in effect for industries classified in 41 of the 77 categories listed in TABLE 8. During this reporting period, Pretreatment staff issued 388 permits to users located in the two districts. Of the 388 permits issued during 2016, there were 138 new permits issued to new commercial and industrial users and 250 permits were reissued to existing users because the old permit expired or the firm changed process operations. A listing of the permits issued in 2016 is provided in ATTACHMENT VOLUME II, SECTION 2.

TABLE 9
Narragansett Bay Commission
Summary of Wastewater Discharge Permits in Effect

Category	Company	Field's Point District	Bucklin Point District	Total Permits In Effect
11	Electroplaters, Metal Finishers	25	15	40
12	Metal Molding And Casting	0	0	0
13	Organic Chemical Manufacturer	0	0	0
14	Pharmaceuticals	0	2	2
15	Metal Formers	0	1	1
16	Steam Electric Power Generating	0	1	1
18	Centralized Waste Treatment Facilities	0	0	0
19	Transportation Equipment Cleaning	0	0	0
21	Tubbing/Vibratory/Mass Finishing	3	5	8
22	Chemical Transporters, Refiners, Recyclers, Manufacturers	3	2	5
23	Textile Firms	2	8	10
24	Printers	7	7	14
25	Industrial Laundries	1	3	4
26	Machine Shops/Machinery Rebuilding	2	2	4
27	Other Firms Discharging Toxics	9	11	20
28	Central Treatment Facilities, Hazardous	0	0	0
29	Central Treatment Facility, Non-Hazardous	0	0	0
34	Manufacturers With High BOD/TSS	3	1	4
35	Firms Discharging Conventional Pollutants	1	3	4
37	Automotive Maintenance/Service Facilities	15	4	19
40	Groundwater Remediation/Excavation Projects	1	2	3
41	Regulated Electroplating Or Chemical Processes Disconnected Or Recycled	10	2	12
42	Other Regulated Processes That Are Disconnected Or Recycled	19	23	42
43	Recycle Electroplating Or Chemical Processes With Cooling Water Or Boiler Discharges	9	0	9
44	Other Recycle Processes With Non-contact Cooling Water Or Boiler Discharges	3	6	9
46	Cooling Water With Solvents/Toxics On Site	5	2	7
49	Firms With Solvents, Toxics, Etc. On Site	1	2	3
51	Cooling Water	3	0	3
52	Boiler Blowdown/Condensate Discharges	9	2	11
53	Cooling Tower Discharges	6	5	11
59	Other Nontoxic Discharges	2	6	8
80	Septage Haulers/Dischargers	1	13	14
81	Food/Meat/Fish Produce Processing (Wholesale)	49	29	78
82	Supermarkets (Retail Food Processing)	23	11	34
83	Parking Garages/Lots	1	0	1

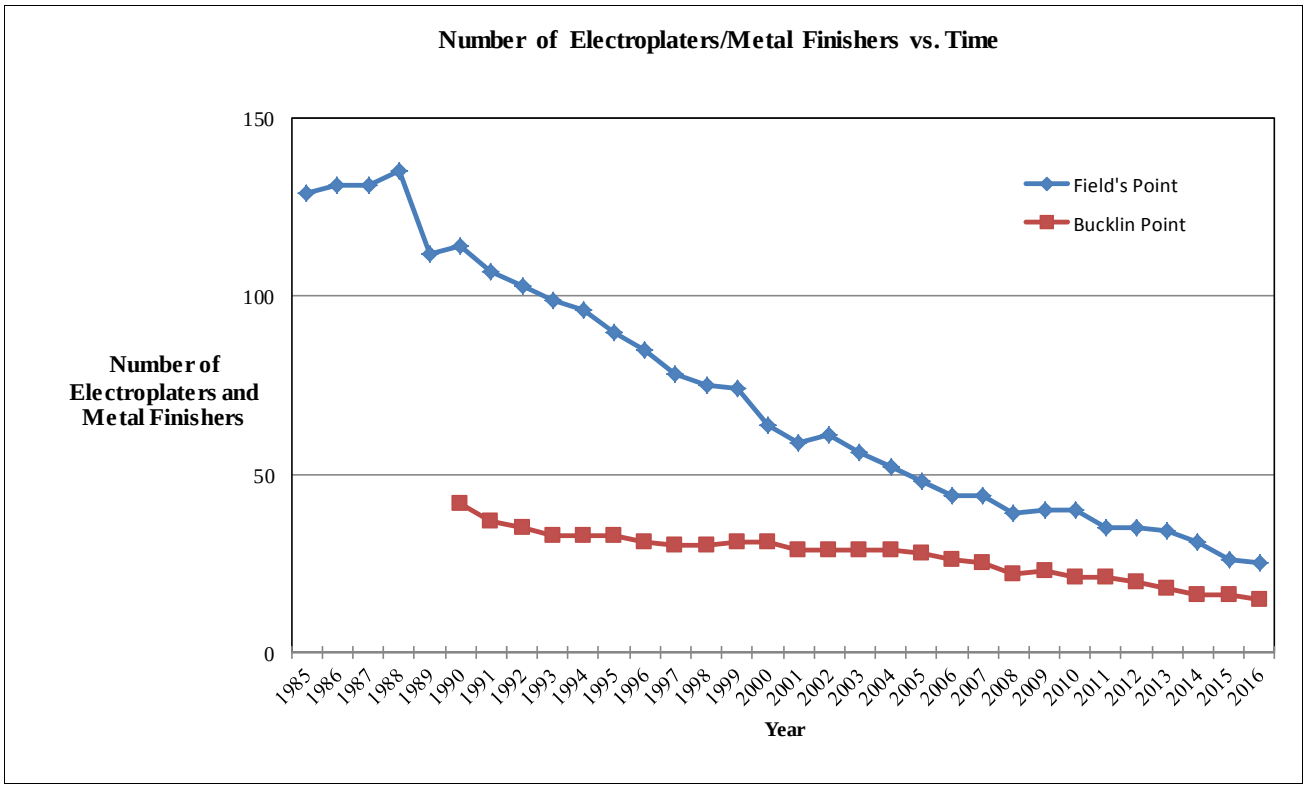
TABLE 9
(Continued)
Narragansett Bay Commission
Summary of Wastewater Discharge Permits in Effect

Category	Company	Field's Point District	Bucklin Point District	Total Permits In Effect
84	Cooling Water/Groundwater/Boiler Discharges	10	0	10
85	Restaurants/Food Preparation Facilities	550	236	786
86	Comm. Buildings With Cafeteria/Laundry	154	42	196
89	Other Commercial Users With Potential to Discharge - Conventional Pollutants	14	8	22
90	Hospitals	11	1	12
91	Cooling Water/Ground Water/Boiler Discharges	0	0	0
92	Laundromats/Dry Cleaners	49	27	76
93	Photo Processing	4	1	5
94	X-Ray Processing	55	34	89
95	Clinical, Medical, And Analytical Laboratories	29	4	33
96	Funeral Homes/Embalming	13	9	22
97	Motor Vehicle Service/Washing	38	15	53
99	Other Commercial Users With Potential To Discharge Toxic Or Conventional Pollutants	25	15	40
	Total Permits in Effect	**1,165**	**560**	**1,725**

There were 12 permits revised and reissued to SIUs in the two districts during 2016, while one new permit was issued to this class of users. Seven of the 12 revised permits were issued to categorical users during 2016, while the five remaining revised permits were issued to significant non-categorical users.

As can be seen from TABLE 9, the largest number of permits in effect are issued to the commercial restaurant and food preparation facilities classified in Category 85, followed by Category 86 permits which are issued to commercial buildings with cafeterias and/or laundry facilities. The next largest category of permitted users are the x-ray processing facilities in Category 94. Facilities classified in Category 11 are the industrial users that contribute the majority of the toxic metal and cyanide loadings to the NBC treatment facilities due to the nature of the electroplating operations they conduct. The dramatic decline of electroplaters and metal finishers in the Field's Point district since 1984 and in Bucklin Point since 1990 is clearly detailed in FIGURE 4. During 2016 the number of electroplaters and metal finishers in both districts decreased by 4.8%, a reduction of two firms from 2015.

FIGURE 4



The NBC issues Wastewater Discharge Permits to all sewer users that discharge non-domestic wastewater into the NBC system and is presently in the process of permitting the remaining non-significant commercial users located throughout the two NBC drainage districts. Copies of the various typical Wastewater Discharge Permits issued by the NBC are provided in ATTACHMENT VOLUME I, SECTION 2.

Permits issued by the NBC typically include the following conditions and requirements:

- A requirement that the user meet local and federal discharge standards at all times.
- Maintenance of a logbook requiring record keeping regarding the operation and maintenance of the pretreatment system, quantity of sludge generated, completed manifest forms, a list of all batch discharges, quantity of chemicals used to provide pretreatment, etc.
- Self-monitoring requirements regarding monitoring and reporting of effluent characteristics and concentrations.
- Reporting requirements for accidental discharges to the sewer system. The user is required to immediately notify the NBC of a spill into the sewer system and is required to file a written report within five (5) days of the incident.

- Submission of a Spill and Slug Prevention Control Plan and a Toxic Organic/Solvent Management Plan. The user is required to contain all spills within the facility as part of the Spill and Slug Control Plan. The Toxic Organic/Solvent Management Plan requires the user to detail process operations, perform a mass balance on the quantity of solvents used in the facility, to sample the waste stream to verify that no solvents are being discharged to the sewer system, and to provide containment of all solvents in case of a spill. Copies of these documents are provided in ATTACHMENT VOLUME I, SECTION 3.

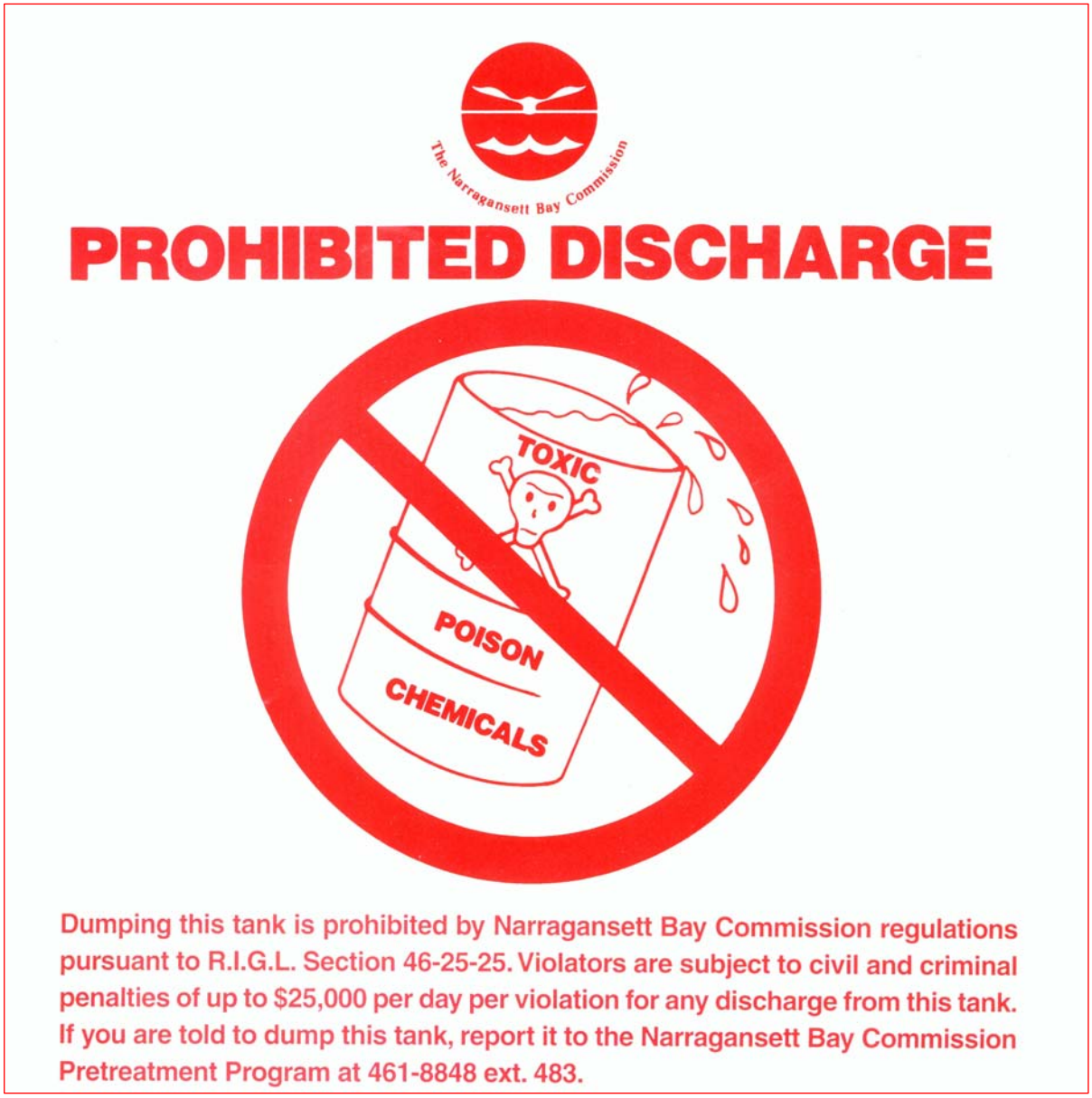
- A prohibition against batch discharges without prior written approval from the NBC to prevent the discharge of concentrated solutions to the sewer system. The NBC developed the prohibited discharge sticker shown in FIGURE 5. This sticker is affixed to all tanks which the industrial user is prohibited from discharging.

- Administrative provisions regarding inspection powers, retention of records, civil and criminal liability and associated penalties, selling the facility, revocation and transferability of the permit, etc.

Tanks at a shutdown plating shop are stickered "PROHIBITED DISCHARGE"

FIGURE 5

PROHIBITED DISCHARGE STICKER



Most permits are issued for a five-year period, but may be issued for shorter periods of time. Permits may be revoked, after notice and hearing, for violations of the NBC Rules and Regulations. On June 30, 2003, the Public Utilities Commission approved a rate structure for NBC wastewater discharge permit fees. Permit fees range from $217 to $14,492 per year. Rates are standardized in both NBC districts and many categories are also flow dependent to encourage water conservation. The existing NBC wastewater discharge permit fee rate structure is provided in TABLE 10.

TABLE 10
Narragansett Bay Commission
Pretreatment Permit Fee Rate Structure

User Category Number	User Classification	Permit Fee
10	**Other Categorical Users**	$1,087.00
11	**Electroplater/Metal Finisher**	
	Flow < 2,500 GPD	$1,811.00
	2,500 ≤ Flow < 10,000 GPD	$3,623.00
	10,000 ≤ Flow < 50,000 GPD	$7,246.00
	50,000 ≤ Flow < 100,000 GPD	$10,144.00
	Flow ≥ 100,000 GPD	$10,869.00
12	**Metal Molding and Casting**	$1,087.00
13	**Organic Chemical Manufacturers**	$7,246.00
14	**Pharmaceuticals**	$1,087.00
15	**Metal Formers**	$5,797.00
16	**Steam Electric Power Generating**	$1,087.00
18	**Centralized Waste Treatment Facilities**	
19	**Transportation Equipment Cleaning**	$1,087.00
21	**Tubbing/Vibratory/Mass Finishing**	
	Flow < 5,000 GPD	$725.00
	Flow ≥ 5,000 GPD	$1,449.00
22	**Chemical Transporters, Refiners, Recyclers, Manufacturers**	$2,898.00
23	**Textile Processing Firms**	
	Flow < 2,500 GPD	$1,449.00
	2,500 ≤ Flow < 10,000 GPD	$3,768.00
	10,000 ≤ Flow < 50,000 GPD	$5,072.00
	Flow ≥ 50,000 GPD	$7,246.00
24	**Printers**	
	Gravure	$3,623.00
	Other Flow ≥ 2,500 GPD	$1,087.00
	Other Flow < 2,500 GPD	$725.00

TABLE 10
(Continued)
Narragansett Bay Commission
Pretreatment Permit Fee Rate Structure

User Category Number	User Classification	Permit Fee
25	**Industrial Laundries**	$3,623.00
26	**Machine Shops/Machinery Rebuilders**	$1,449.00
27	**Other firms discharging toxics and/or prohibited pollutants**	
	Flow ≥ 10,000 GPD	$2,898.00
	2,500 ≤ Flow < 10,000 GPD	$1,449.00
	Flow < 2,500 GPD	$725.00
28	**Central Treatment Facilities - Hazardous Waste**	$14,492.00
29	**Central Treatment Facilities - Non-Hazardous Waste**	$4,348.00
34	**Manufacturers with high BOD/TSS wastestreams**	
	Flow ≥ 100,000 GPD	$5,797.00
	50,000 GPD ≤ Flow < 100,000 GPD	$3,623.00
	10,000 GPD ≤ Flow < 50,000 GPD	$1,811.00
	Flow < 10,000 GPD	$1,087.00
35	**Other facilities discharging conventional pollutants**	
	Flow ≥ 10,000 GPD	$1,449.00
	Flow < 10,000 GPD	$725.00
37	**Automotive Maintenance/Service Facilities**	
	Small ≤ 2 Bays	$435.00
	Large ≥ 3 Bays	$1,449.00
40	**Groundwater Remediation/Excavation Projects**	
	Flow ≥ 10,000 GPD	$1,449.00
	Flow < 10,000 GPD	$725.00
41	**Recycle or Disconnected Electroplating or Chemical Processes**	$725.00
42	**Other Process Operations Disconnected or Recycled**	$290.00
43	**Recycle or Disconnected Electroplating or Chemical Processes with Cooling Water or Boiler Discharges**	$870.00
44	**Other Recycled or Disconnected Process Operations with Cooling Water or Boiler Discharges**	$362.00
46	**Cooling Water with Solvent, Toxic and/or Hazardous Chemicals on Site**	$362.00
49	**Other Discharges with Solvents, Toxics and/or Hazardous Chemicals on Site**	
	Flow ≥ 10,000 GPD	$1,087.00
	Flow < 10,000 GPD	$725.00

TABLE 10
(Continued)
Narragansett Bay Commission
Pretreatment Permit Fee Rate Structure

User Category Number	User Classification	Permit Fee
51	**Cooling Water with No Solvents, Toxic or Hazardous Chemicals on Site**	$362.00
52	**Boiler Blowdown/Condensate Discharges**	$362.00
53	**Cooling Tower Discharges**	$362.00
59	**Other Non-Toxic Industrial Discharges**	
	Flow ≥ 5,000 GPD	$725.00
	Flow < 5,000 GPD	$362.00
80	**Septage Haulers/Dischargers**	$435.00
81	**Food/Fish/Meat/Produce Processing (wholesale)**	
	Flow < 1,000 GPD	$362.00
	1,000 GPD ≤ Flow < 10,000 GPD	$725.00
	Flow ≥ 10,000 GPD	$1,449.00
82	**Supermarkets (Retail Food Processing)**	$725.00
83	**Parking Garages/Lots**	$725.00
84	**Cooling Water/Groundwater/Boiler Discharges with Potential to Discharge Conventional Pollutants**	$362.00
85	**Restaurants**	
	< 50 seats	$217.00
	≥ 50 seats < 100 seats	$435.00
	≥ 100 seats of fast food (2 or more fryolators and/or drive through window)	$580.00
86	**Commercial Buildings with Cafeteria and/or laundry operations**	$725.00
89	**Other Commercial Facilities with Potential to Discharge Conventional Pollutants**	
	Flow < 2,500 GPD	$362.00
	Flow ≥ 2,500 GPD	$725.00
90	**Hospitals**	$3,623.00
91	**Cooling Water/Groundwater/ Boiler Discharges with Potential to Discharge Toxic, Prohibited and/or Conventional Pollutants**	$362.00
92	**Laundries/Dry Cleaners**	
	Laundromats	$725.00
	Dry Cleaners with 1 washer or less	$362.00
	Dry Cleaners with ≥ 2 washers	$725.00
93	**Photo Processing**	
	Flow < 1,000 GPD	$362.00
	1,000 GPD ≤ Flow < 2,500 GPD	$725.00
	2,500 GPD ≤ Flow < 5,000 GPD	$1,087.00
	Flow ≥ 5,000 GPD	$1,449.00

TABLE 10
(Continued)
Narragansett Bay Commission
Pretreatment Permit Fee Rate Structure

User Category Number	User Classification	Permit Fee
94	**X-Ray Processing**	
	≤ 2 processors	$362.00
	3 - 4 processors	$725.00
	5 - 9 processors	$1,087.00
	≥ 10 processors	$1449.00
95	**Clinical, Medical and Analytical Laboratories**	$725.00
96	**Funeral Homes/Embalming Operations**	$362.00
97	**Motor Vehicle Service/Washing Operations**	
	rate per tunnel	$725.00
	rate per bay	$217.00
	maximum rate per facility	$1,449.00
99	**Other Commercial Users with Potential to Discharge Toxic, Prohibited and/or Conventional Pollutants**	
	Flow < 2,500 GPD	$362.00
	Flow ≥ 2,500 GPD	$725.00

Zero Process Discharge Wastewater Systems

During 2016, there were 72 users in the two NBC districts operating facilities which have eliminated or significantly reduced their process discharges to the sewer system through the installation of closed loop or zero discharge systems. Although still conducting operations which generate wastewater containing toxic materials, this wastewater is treated and reused in the process operation, resulting in no discharge of industrial process wastewater, or in some cases, insignificant discharges to the sewer system consisting primarily of boiler condensate or non-contact cooling wastestreams. Once Pretreatment staff has verified that the process wastewater discharge has been eliminated or significantly reduced, the user is reclassified into Category 41 through 44 depending upon the type of recycle process operations conducted.

Part of an Ion Exchange System at a Permitted Zero Discharge Facility

Although an industrial user may cease discharging process wastewater into the sewer system by installing a wastewater recycle system, the firm will still be permitted and inspected by Pretreatment staff. Since the facility has sanitary sewer connections, it could still be a potential source of pollutant discharges into the NBC sewer system which could potentially contribute to a plant upset or a pass-through situation. For this reason, the Pretreatment Section routinely issues Zero Process Wastewater-Sanitary Discharge Permits to category 41 and 42 industries. Fifty-four facilities are presently classified in categories 41 and 42 and do not discharge process wastewater to the sewer system. Users with recycle process operations but still discharge condensate, boiler or cooling water wastestreams are issued discharge permits. There are 18 of these users which are classified in categories 43 and 44. Of the 72 users classified in categories 41 through 44, 41 facilities are permitted to operate zero process discharge wastewater recycle systems in the Field's Point district, while 31 users in the Bucklin Point district are permitted to perform zero discharge recycle operations. Prior to the issuance of a Zero Process Wastewater-Sanitary Discharge Permit, the NBC thoroughly notifies the industrial users of all DEM and RCRA requirements and the user must satisfy the following NBC requirements:

- Submit a Zero Discharge Permit Application.
- Submit a Facility Sewer Access Site Plan showing all sewer connections.
- Submit Process Operation Plans.
- Submit Pretreatment System Plans.

- Submit a Spill and Slug Prevention Control Plan.

- Seal all floor drains and cap off all process sewer access locations.

- Install prohibited dumping signs at all sanitary sewer connections.

Once all the aforementioned tasks have been completed by the user, the facility is inspected, and the Zero Process Wastewater-Sanitary Discharge Permit is issued. The Zero Discharge Permit requires the user to submit a written certification either monthly or biannually, depending upon facility process operations, listing water meter readings and certifying that no process discharges have occurred. Pretreatment staff use this water meter data to routinely calculate daily water usage. Deviations from the expected zero discharge water usage are promptly investigated by pretreatment staff. In addition, unannounced inspections of every zero discharge firm are conducted at least twice annually. A copy of the Zero Process Wastewater-Sanitary Discharge Permit can be found in ATTACHMENT VOLUME I, SECTION 2.

User Survey Methods

The Pretreatment Program utilizes many methods to identify and locate new and previously unknown users of the sewer system. These NBC methods have been very successful at maintaining an accurate inventory of non-domestic regulated users and at ensuring that modifications to existing user facilities are quickly discovered. The following is a summary of the survey methods:

- *Newspaper Reviews* - The local newspapers are routinely reviewed to identify and locate new or previously unknown and unpermitted users. Review of the classified, business and new corporation sections of the local newspapers have allowed the NBC to successfully identify many new sewer users over the years. Form letters are issued to new corporations to alert them to NBC Rules and Regulations and permitting requirements. Routine reviews of the bankruptcy and auction sections of the newspaper alert Pretreatment staff to firms which may be in financial trouble or ceasing operations. This allows Pretreatment staff to be proactive at preventing illegal discharges from financially troubled firms. Such firms are promptly inspected, inventoried and required to comply with a rigid facility shutdown procedure. The NBC will often seal the sewer connections at these firms once operations have ceased to ensure that hazardous waste and chemicals are not illegally discharged into the sewer system.

- *Business Listing Website Reviews* - Pretreatment staff reviews business listing websites such as www.whitepages.com and www.yellowpages.com to identify new industrial and commercial users that may require regulation. Particular attention is given to reviewing categorically regulated user categories such as electroplaters, metal finishers, metal formers, etc.

- *Social Media Reviews* – Pretreatment staff routinely reviews social media websites such as Facebook to identify any previously unknown industrial and commercial users. This survey method is particularly useful in identifying new food service establishments.

- *Intra-Governmental Agency, Building and Sewer Connection Permit Referrals* - The Pretreatment Section becomes aware of many new facilities through the building permit issuance process. New facilities under construction in the NBC districts must obtain a sewer connection permit and a discharge permit, if necessary, prior to beginning construction and/or process operations. Firms performing construction modifications to their buildings are referred to the NBC by the local building inspectors and must obtain NBC approval in order to obtain the necessary city or town building permit or certificate of occupancy. Local building inspectors, plumbing inspectors and inspectors from the Department of Health, DEM and EPA New England refer information to the Pretreatment staff regarding new or unpermitted users. This cooperative work effort has resulted in the permitting of many users over the years.

- *Mill Complex and Industrial Park Inspection Program* - Regular inspections of industrial mill complexes within the NBC service district are performed to identify new and possibly transient users of the NBC facilities. Each staff member is assigned several mill complexes and industrial areas located throughout the NBC districts. Staff members are required to inspect at least one mill complex or industrial area per month to identify potential new nondomestic users of the NBC sewer system. During the mill complex and industrial area inspections, staff members compile a listing of all unpermitted facilities located within the mill or area, and systematically inspect each unpermitted facility to determine whether a wastewater discharge permit is necessary based upon the operations performed, wastewater generated and discharged to the sewer system. A listing of each facility, the type of operations performed, and whether or not a wastewater discharge permit is necessary is maintained for each mill complex and industrial area and filed by the mill complex street address or by the streets forming the boundaries of the industrial area. This procedure enables the NBC to track changes within individual mills and prevents duplication of efforts by ensuring that this information is continually updated. Industrial areas are routinely driven through and all industrial facilities in the area are cross-checked against the NBC Pretreatment database. Unknown or unpermitted users are promptly inspected and permitted, if necessary.

- *Public Information Programs* - Over the years, the NBC has routinely published public notices to alert NBC users of the need to obtain a wastewater discharge permit if specific operations are conducted. The NBC has participated in the annual "We Mean Business" Expo sponsored by the RI Secretary of State to assist prospective business owners understand the NBC Rules and Regulations.

The NBC has also met with various user groups and held workshops that focused on educating any new class of users required to obtain a discharge permit. In 2016 NBC met with state and local Economic Development agencies to assist with drawing new business to the State. These public education programs have been very effective at identifying new and previously unknown users of the sewer systems.

NBC User Inspection Programs

One of the main objectives of the Pretreatment Program is to protect the NBC wastewater treatment plants from toxic discharges which could result in pass through to the receiving waters or interference with their proper operation, as outlined in 40CFR§403.5. In addition, Pretreatment staff ensure that federal, state and local pretreatment regulations pertaining to the Clean Water Act are met. The strategy the NBC adopted and implemented to satisfy these objectives includes developing local discharge limitations to protect the treatment facilities and public health, permitting of industrial and commercial facilities to control the discharge of toxics, inspecting and sampling nondomestic facilities to ensure user compliance, and the development and implementation of extensive user education programs. The extensive user education efforts implemented by the NBC as part of routine inspections have been very effective at improving user compliance rates. ESTA staff educates users of the many pollution prevention alternatives available instead of discharging toxics into the sewer system, while Pretreatment staff incorporates user education into every regulatory inspection.

- **Innovative and Effective Inspection Techniques** - Pretreatment staff employs many effective and innovative inspection techniques to aid in achieving the objectives of the NBC to control and reduce pollutant loadings to the treatment plants and hence Narragansett Bay. These techniques range from implementing simple internal procedures to standardize inspection activities to forming partnerships with the regulated industrial community. The following is a summary of these highly effective and innovative techniques and programs:

    ~ *Standardization of User Inspection Activities and Documents* - The Pretreatment Section has made great efforts to thoroughly standardize all aspects of the inspection process from inspection scheduling to writing the inspection report and letter. Annual inspection checklists have been standardized and customized for various classes of users, including for SIUs, non-significant industrial users, restaurants, dental facilities, septage haulers, etc. Pretreatment has also developed form letters to schedule the annual SIU inspection and to summarize and transmit the results of facility inspections for various user classes. The various inspection checklists ensure Pretreatment staff inspect and review all items of importance at a particular type of facility in a uniform, clear, and concise manner consistent with NBC and EPA protocols. The annual inspection checklist for SIUs has been developed to ensure full NBC compliance with all

EPA regulations and to ensure uniform inspections of all SIUs, irrespective of the inspector conducting the facility inspection. The inspection summary form letters may be a Notice of Violation (NOV) or a "Job Well Done" letter. The NOV has all routine deficiencies clearly listed. The inspector can then quickly check off the violations observed, add any special facility requirements and the letter can be promptly prepared and issued. In addition to citing the deficiency, the letter explains in an educational manner the reason for the regulation and the importance for ensuring compliance. The standardization of inspection documents has resulted in speedy completion and issuance of uniform inspection reports and summary letters to the user. An inspection report and summary letter are issued for each and every user inspection, typically within fourteen (14) days from the site visit.

Throughout 2016 Pretreatment staff continued to utilize additional inspection checklists that were developed to be used on iPads. These checklists allow staff to begin filling in checklists electronically in the office, complete it in the field, then download and print it back in the office. The iPads also allow staff to take pictures in the field and attach them directly to the inspection memo.

~ *Specialized and Innovative Inspector Training Programs* – The NBC provides extensive training to new employees and continued training to existing staff. Pretreatment, EMDA, and ESTA staff receive training in all aspects of their positions. On an annual basis, the NBC conducts its own training or contracts outside vendors for the training in the following areas:

- Confined Space Entry Training
- 40 Hour OSHA HAZWOPER Training
- 8 Hour OSHA HAZWOPER Recertification Training
- OSHA Right to Know Training
- CPR/AED Training
- First Aid Training
- Spill Tracking Training
- Emergency Response Training
- Boom Deployment

The NBC stresses consistency to Pretreatment staff in regulating industrial and commercial users. Pretreatment staff are continually being trained to be consistent. The following is a list of the methods used to ensure consistency:

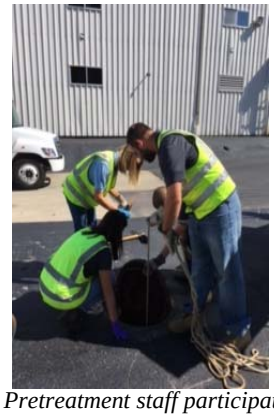
- In-box reviews of staff
- Weekly Plan Review Meetings consisting of all technical staff
- Supervisors accompany staff members on inspections
- Supervisors review staff letters, memos, and permits

In addition to the forementioned methods used to ensure consistency, Senior Pretreatment staff conduct training sessions on Pretreatment procedures. The training includes the following topics:

- Rules & Regulations
- Permit Writing
- Letter and Memo Writing
- Process Operations
- Pretreatment Technologies
- Spill Response and Tracking
- Map Reading
- Permitted User Flow Data

Pretreatment staff also routinely attend technical seminars to further their knowledge and productivity. The Pretreatment Section has developed several innovative employee-training programs which resulted in more efficient inspection procedures. Supervisory staff work very closely with the engineers and technicians charged with performing the daily user inspections. New staff members are closely supervised by senior staff members to ensure that they properly learn the standard operating procedures.

In-box reviews are conducted of staff to ensure that they understand user requests and what response is required and monthly in-box reviews are conducted of all staff members to ensure standardization of methods and conformance with work schedules. Senior staff members accompany new staff members on their inspections to help them become familiar with NBC user education presentations, process operations, pretreatment systems, and permit requirements. In addition, senior staff routinely conduct inspections with veteran inspectors to ensure continued conformity with NBC inspection policies and protocols.



Pretreatment staff participate in the annual Spill Response and Tracking Drill

Feedback, detailing what aspects of the inspection were done well and what aspects need improvement, is provided to the inspector verbally as well as in writing. The Pretreatment Inspector Feedback Form was developed for this purpose. The feedback form consists of several sections which cover all aspects of the facility inspection process, including pre-inspection preparation, inspection interaction with the user, user education, facility inspection observational abilities, inspection documentation, professionalism, self-confidence, etc. New employees are not permitted to conduct inspections alone until all aspects of a good inspection, as noted on the feedback form, are satisfactory.

Another innovative training program implemented the annual Spill Response and Tracking Drill. Staff participate in a classroom presentation which includes tabletop exercises simulating unusual discharges to the treatment plant and spills occurring in the sewer system. In addition, staff participate in training exercises in the field. Senior staff establish a source of "illegal discharge" and identify key manholes for the staff to follow. Senior staff assign a team leader to head the mock investigation to track the "illegal discharge" to the source. For the training drill, a newer employee is typically chosen to be the team leader.

The mock spill is tracked through the sewer system in an attempt to identify the source, where a thorough facility inspection is conducted. Inspectors are trained to collect evidentiary samples necessary for a good enforcement action. This annual tracking, evidence gathering and inspection drill has greatly improved the awareness and inspection abilities of all NBC Pretreatment staff.

~ *Pollution Prevention Referral Program* – During all Pretreatment regulatory inspections, Pretreatment staff routinely refer the user to the ESTA Section for free technical assistance. All NOVs also advise users to obtain the free expertise of the ESTA Section. These referrals have resulted in improved compliance rates and non-compliant users achieving compliance more quickly.

~ *Inspection Educational Efforts* – User education is by far the single most important aspect of any user inspection. During the annual inspection, industrial users are educated regarding all aspects of the NBC including the NBC Mission Statement, the purpose and types of all NBC inspections, and SNC criteria. The inspector clearly explains what constitutes SNC, the importance of maintaining full compliance and all permit requirements are explained to the user in detail. NBC inspection summary letters are also very educational in nature. Instead of simply requiring a user to perform a task, the letter educates the user regarding the reason for the imposed requirement. This often results in quick user compliance with the imposed requirements. These extensive user education efforts have been very effective at encouraging user compliance. The SIU rate of SNC was impressively reduced in the Field's Point District from a high of 39.0% in 1992 to 5.4% in 2016, while the SIU Rate of SNC for Bucklin Point was reduced from a high of 44.8% in 1994 to 8.8% in 2016. The overall rate of SNC for all NBC SIUs for 2016 was 7.0%, a slight decrease from 8.2% observed in 2015. This is well within the EPA level of 10% recommended for EPA Pretreatment Program Excellence recognition. These impressive reductions in the Rate of SIU SNC are clearly attributable to improved user education, prompt resampling requirements for any effluent violation and proactive communication with users to encourage correcting the violation before being in SNC.

- **Types of Pretreatment Inspections -** The NBC conducts six types of inspections of industrial and commercial users. The following is a summary of the inspection types utilized by the NBC:

  ~ *Initial Inspection* – The initial inspection can be an announced or unannounced inspection and is performed to determine if the user is regulated under pretreatment regulations and to inform the user of pretreatment requirements.

  ~ *Annual Inspection* – An annual inspection is a thorough, announced inspection of the facility and the user's records to determine if the firm is complying with all NBC and permit requirements. This inspection is done once per 12 month period for SIUs and covers all the items shown in the Annual Inspection Checklist which is provided in ATTACHMENT VOLUME I, SECTION 3. The annual inspection consists of an extensive review of paperwork, processes, pretreatment systems, treatment procedures, sampling procedures, spill containment measures, and chemical/waste storage areas.

  ~ *Follow-up Inspection* – This inspection may be an announced or unannounced inspection to determine if specific items noted in an annual inspection were completed as required. Follow-up inspections may be conducted to view work in progress, work completed, or discuss problems that the firm may be having in complying with or understanding NBC or Pretreatment Program requirements.

  ~ *Sampling Inspection* – The sampling inspection is an unannounced inspection which must be conducted of every SIU at least once every 12 months, as required by EPA regulations. The NBC typically conducts sampling of each SIU twice every 12 months.

  ~ *Emergency Response or Special Investigation Inspection* – This is an immediate unannounced inspection initiated in response to a complaint or spill to determine the source of problems occurring in the sewer system. These problems or complaints are typically reported by NBC employees, local authorities or by district residents.

  ~ *Facility Shutdown Inspection* – This is typically an announced inspection to conduct an inventory of all chemicals and solutions on-site, to observe facility decontamination procedures, to seal sewer connections to prevent illegal discharges to the sewer, and to install prohibited discharge stickers on all tanks.

Facility Shutdown Inspection of an electroplating facility that is no longer in operation.

Follow-up inspection of the same facility to verify that the firm has disposed of all solutions and complied with NBC Shutdown Procedures.

From January 1, 2016 through December 31, 2016, Pretreatment staff conducted 2,032 inspections of users, not including sampling visits. Of the 2,032 non-sampling inspections conducted by the Pretreatment staff, 275 were inspections of SIUs and 1,757 were inspections of non-significant users. Pretreatment staff conducted 182 facility inspections of categorical users and 93 inspections of significant non-categorical industrial users in both districts, excluding sampling visits. Pretreatment staff conducted 50 regulatory compliance meetings with users during 2016.

Pretreatment staff inspected all companies but two classified as SIUs at least twice during the 12 month review period. One SIU that was only inspected once in 2016, Microfibres, Inc., filed bankruptcy and abruptly went out of business in mid-January. Pretreatment staff was only able to inspect the facility once before the building was vacated. The second SIU that was only inspected once in 2016, Orbit Energy Rhode Island, LLC, will conduct food waste to energy operations. This facility was under construction throughout 2016. The company will begin operations in early 2017. An inspection of the site was conducted in late 2016. The Pretreatment Section satisfied and exceeded EPA requirements to inspect every SIU at least once every twelve month period.

During 2016, EMDA staff conducted 188 industrial user sampling inspections of 76 industrial user facilities resulting in the collection of 1,761 composite and grab samples. These 1,761 samples translated to 194 user monitoring reports. Of the 194 monitoring reports, 184 were issued to significant users and 10 were issued to non-significant users. There were 106 sampling inspections of 45 categorical industries and 69 sampling inspections of 24 significant non-categorical users.

All facilities classified as SIUs were sampled by EMDA at least twice in 2016 with the exception of three. One of these companies, Microfibres, Inc. filed for bankruptcy and abruptly went out of business in mid-January. EMDA staff was able to collect one sample before the company vacated the building. One of the SIUs that was unable to be sampled, Tanury Industries PVD, Inc. discharges on a batch basis. During 2016, the company collected all process wastewater and shipped it off-site for disposal. This was verified by Pretreatment staff during inspections. EMDA staff regularly contacted the company to inquire if a batch was to be discharged to the sewer. The final SIU that was unable to be sampled in 2016, Orbit Energy Rhode Island, LLC, was under construction throughout 2016. The company did not discharge process wastewater to the sewer.

TABLE 11 summarizes the status of each company that was inspected or sampled by the NBC at least twice in 2016.

TABLE 11
Summary of SIUs Inspected or Sampled Less than Twice in 2016

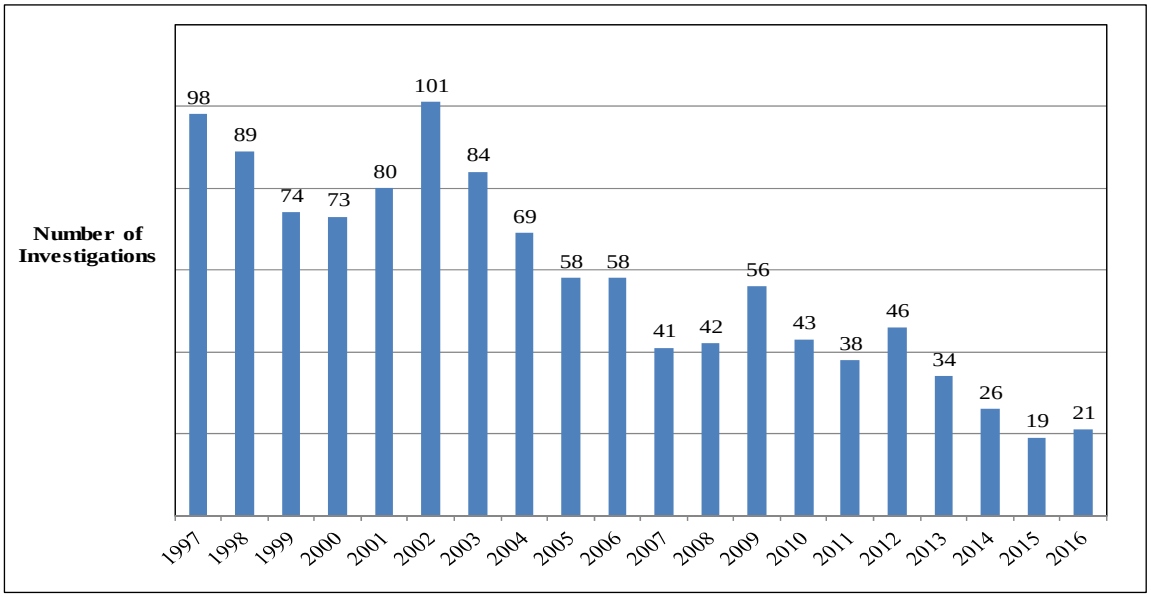
Company Name	2016 Inspection Sample Summary	Explanation
	Field's Point	
Orbit Energy Rhode Island, LLC	1 Inspection only No Samples	Facility under construction – no process wastewater discharged
	Bucklin Point	
Microfibres, Inc.	1 inspection only 1 sample only	Firm ceased operations in January 2016
Tanury Industries PVD, Inc.	No Samples	Firm shipped all process wastewater off-site

A summary of the number of types of inspections performed by the NBC this reporting period is provided in TABLES 3 and 5, the Pretreatment Performance Summary Sheets, which are contained in CHAPTER I of this report. A list of each NBC sampling and nonsampling user inspection and the inspection date is provided in ATTACHMENT VOLUME II, SECTION 2.

Emergency or Special Investigations

During 2016, Pretreatment staff investigated 21 reports of spills, odors, blockages, unusual plant influents, and illegal discharges to the sewer system within the Field's Point and Bucklin Point service areas. A listing of 2016 emergency or special investigations is provided in ATTACHMENT VOLUME II, SECTION 4. FIGURE 6 is a graphical trend analysis detailing the number of pretreatment investigations conducted annually since 1995.

FIGURE 6
Number of Special Investigations per Year

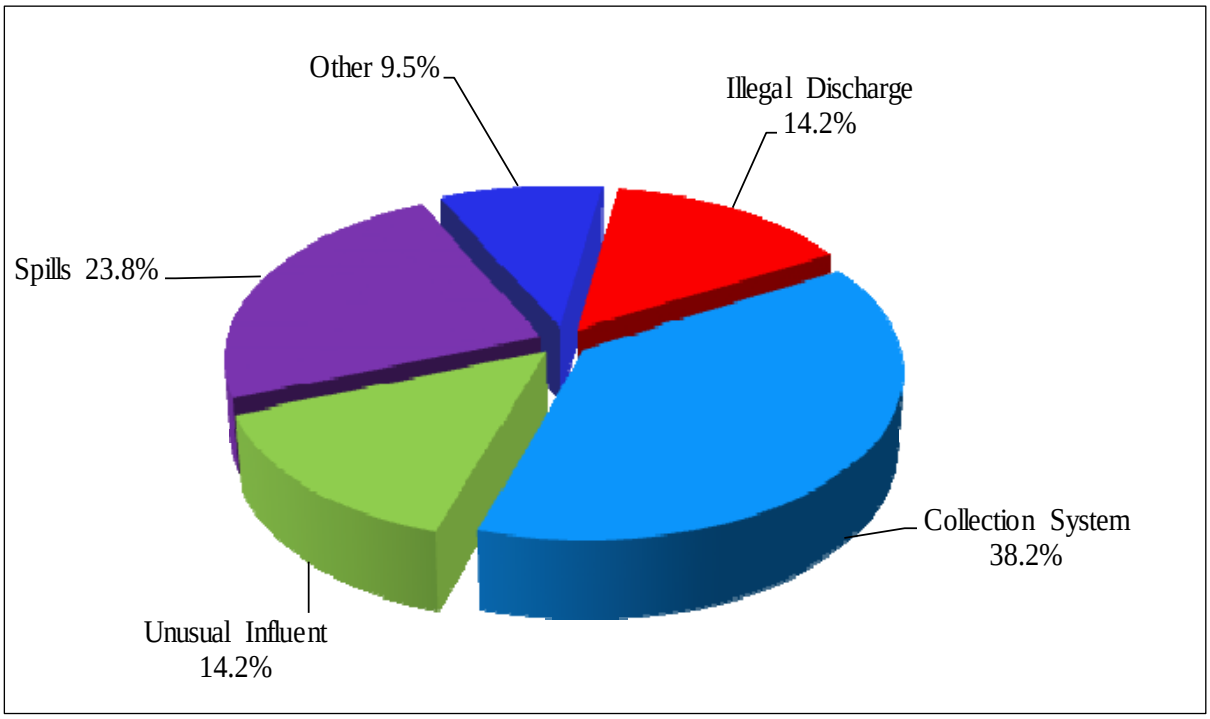


As can be seen from FIGURE 6, the number of investigations and spill response activities fluctuates from year to year, but has been significantly reduced from the number of investigations conducted in the late 1990s. The number of emergency and special investigations conducted in 2016, 21, is the second lowest number on record. This is attributed to better education of users regarding spill prevention practices, overall environmental awareness by industry and the decline of SIU manufacturing facilities in the district.

FIGURE 7 graphically depicts the breakdown of the types of investigations that occurred in 2016. As can be seen from the chart, the majority of the investigations resulted primarily from problems in the collection system, which accounted for eight investigations. The breakdown of the remaining investigations is as follows: spills accounted for five investigations, illegal discharges accounted for three investigations and reports of unusual influent, including color accounted for three investigations responded to by staff.

These investigations often require frequent follow-up activities, subsequent inspections and clean-up activities, and may result in the initiation of enforcement actions by the NBC. Numerous follow-up inspections were required as a result of these initial 21 investigations. Those NBC investigations of major concern and interest to the NBC over the past year are described in the following paragraphs.

FIGURE 7
Breakdown of 2016 Investigations



Spill Investigations

During 2016, Pretreatment staff conducted five investigations in response to reports of spills. Three of the spills occurred in the Field's Point district and two occurred in the Bucklin Point district.

Primary Sludge Spill at Field's Point

Two of the Field's Point spills occurred at the treatment plant. The first spill occurred when Maintenance staff was repairing a primary sludge line. A clean-out cover on the primary sludge line was inadvertently removed. This caused approximately 21,000 gallons of primary sludge to be released to the ground. There are catch basins that are directly connected to the plant storm water system in the area of the release. Plant staff was able to isolate these drains. However, approximately 930 gallons of sludge discharged into the storm water system. The storm line was plugged. The sludge was collected and properly treated. The area and storm line were flushed and treated with hypochlorite. The water and hypochlorite used for cleaning were also collected and disposed of properly. The treatment plant and Providence River were not adversely impacted.

The second spill at the treatment plant occurred when a vendor testing the fire suppression system in the carbon feed building accidently set off the system. Fire suppression foam was released to the four MicroC storage tanks and the secondary containment for the tanks. The foam also reached the Biological Nutrient Removal (BNR) system via a sump. The sump pump was shut down once the foam was discovered. Effluent sampling for the day did not indicate the foam interfered with the BNR process. The vendor contracted an environmental response company to clean-up the secondary containment area and sump as well as pump the foam out of the tanks.

Fire Foam Secondary Containment

Cement Truck on 95 North on Ramp

The third investigation conducted in response to a spill in Field's Point occurred when a truck hauling powdered cement tipped over on an on-ramp to Route 95N in Providence. Cement was released to the roadway and the ground below the on-ramp. There was a small quantity of hydraulic fluid that leaked on the roadway. Absorbent material was used to clean-up this material. The cement on the roadway, ground and still contained in the truck as well as the truck fuel and absorbent material was cleaned-up by an environmental response company for disposal. The sewer system was not impacted by this spill.

The first spill investigation that occurred in the Bucklin Point district was in response to a report from Operations staff stating there was a strong fuel odor at the plant and the influent was discolored. Pretreatment staff tracked the odor to Memorial Hospital of Rhode Island located in Pawtucket. Upon entering the hospital, Pretreatment staff was informed that there had been a diesel fuel spill earlier in the day. The spill was caused by an automatic fill valve that failed. The spilled fuel discharged to the sewer via a drain located in a vault outside of the generator room. At the time of the investigation, the spilled fuel was in the process of being cleaned-up and the valve was being repaired. The treatment processes at the Bucklin Point plant were not impacted by the diesel fuel. An Administrative Order (AO) was issued to Memorial Hospital for not reporting the spill in accordance with its Wastewater Discharge Permit and approved Spill & Slug Prevention Control Plan. Additional information on the AO can be found in CHAPTER VI.

The second Bucklin Point spill investigation occurred at the treatment plant. A fitting on a Return Activated Sludge (RAS) line failed causing RAS to be released to the ground and pavement behind the hypochlorite building. The RAS flowed to a catch basin that is connected to the plant storm water system. The catch basin was immediately protected by the use of absorbent materials and sand bags. The catch basin was opened and the level of material was below the discharge pipe. The storm water system was inspected and it was verified that RAS did not discharge from the initial catch basin. The discharge line in the catch basin was plugged. The RAS was pumped out of the catch basin and any sludge on the ground was shoveled into buckets. The impacted area was washed down to the catch basin and hypochlorite was applied for disinfection. The RAS and wash water were pumped back to the treatment process. The Bucklin Point treatment processes and Seekonk River were not adversely impacted by this spill.

Protected Catch Basin

Broken RAS Line

Illegal Dumping & Unpermitted Discharges

Pretreatment staff investigates all reports of illegal dumping and unpermitted discharges to the sewer system, storm drains and/or NBC receiving waters. In 2016 Pretreatment staff investigated three reports of illegal dumping or unpermitted discharges. Two reports occurred in the Field's Point district and one occurred in the Bucklin Point district.

Both of the Field's Point investigations were reports of companies discharging vehicle wash water to the sewer. The first report was that a company in Johnston was washing trucks on its property and discharging the wash water to the sewer via catch basins on Priscilla Lane. The report also stated there was a leaking fuel tank on the property. Pretreatment staff was not allowed on the property but did speak with a representative of the company. The representative stated that there are no connections to the sewer from this property and it was on septic. This was verified by NBC Customer Service staff who had previously conducted a dye test of the facility. Catch basins were not observed on the property from the perimeter. No catch basins were observed on Priscilla Lane. The matter was referred to DEM. The second report of illegal dumping was in regard to two facilities on Prairie Avenue and Colfax Street in Providence. The facility on Prairie Avenue installs car audio systems. The owner stated customer cars are not washed at the location. The facility on Colfax Street is a private residence. There was no indication that a car washing business was operating at the location. The Field's Point plant was not impacted by either report of illegal discharge.

The final investigation of illegal discharge occurred in Bucklin Point. This investigation was a continuation of an investigation of Independent Auto Sales, located in Pawtucket that occurred in late December 2015. This facility was found pumping process wastewater to a catch basin in December 2015. During the 2016 investigation, Pretreatment staff assisted DEM Criminal staff in determining if sumps in the parking lot of the facility were connected to the sewer system. A dye test was conducted and it was determined the sump was not connected. DEM Criminal is pursuing this matter.

Unusual Influent Investigations

Pretreatment staff investigates all reports of unusual influent at both treatment plants. During 2016, Pretreatment staff investigated three reports of unusual influent. All three reports were from the Bucklin Point plant. Two of the reports were that the influent from the Blackstone Valley Interceptor (BVI) was discolored. Both incidents of colored influent were of short duration, less than 45 minutes, and could not be tracked. All facilities with the potential to impact the treatment plant with colored wastewater were contacted and required to submit their color logs for the days of the reports as well as the prior day. Reviews of the logs did not indicate any companies that could have potentially discharged the color in question at a time that would impact the plant. The third report of unusual influent stated the influent from BVI contained a great deal of foam. The foam came into the plant for only a short duration and could not be tracked. Operations staff collected a sample of the influent with the foam. The foam quickly dissipated. The treatment plant and the Seekonk River were not adversely impacted by these unusual influents.

Food Preparation Related Grease Investigations

During 2016, Pretreatment staff conducted eight grease related investigations. All eight of the investigations occurred in the Field's Point district and were associated with food preparation operations. Three of the grease investigations occurred in the Federal Hill section of Providence. The first report on Federal Hill was that sewer lines in the Crout and Spruce Streets area were flowing slowly and debris and grease were observed in the lines. In addition what appeared to be grease laden wastewater was running down Crout Street. Pretreatment staff determined there were six restaurants that discharge to this location. Four of the six restaurants were permitted at the time of the investigation. Two of the permitted restaurants were closed for renovations. The grease removal unit at one of the remaining permitted restaurants was malfunctioning. A Notice of Violation requiring the grease removal unit to be repaired was issued to this restaurant. The remaining permitted restaurant was in compliance with its permit and maintaining its grease removal unit. The two unpermitted restaurants were required to install grease removal equipment and obtain Wastewater Discharge Permits. The second investigation in the Federal Hill area was in response to a report that the sewer lines in the area of DePasquale Plaza were running slowly and grease was observed in the lines. There were four restaurants discharging to the impacted area. Only one of the restaurants was permitted at the time of the investigation. The inspection of the permitted restaurant revealed its grease removal unit to be unplugged. A Notice of Violation requiring the grease removal unit to be operational at all times was issued to the restaurant. Only one of the three remaining restaurants was open at the time of the investigation. This restaurant had installed and was maintaining a grease removal unit. It was required to obtain a Wastewater Discharge Permit. The remaining two restaurants were inspected at a later date. They were required to install grease removal equipment and obtain a Wastewater Discharge Permit. The third grease investigation in the Federal Hill area was conducted in response to a report that grease laden wastewater was running down Spruce Street. The wastewater was tracked back to a permitted restaurant that was washing its exhaust hoods outside of the facility. The manager was informed that wastewater from exhaust washing must be discharged in accordance with the Wastewater Discharge Permit. A Notice of Violation was issued to this restaurant.

Grease in a Yard Drain

The fourth grease investigation in Field's Point was conducted in response to a report of drains behind a permitted restaurant being full of grease. A previous inspection of this location determined these drains were not connected to the sewer. The inspection of the restaurant determined the grease removal unit was not operational. A Notice of Violation requiring the grease removal unit to be repaired and training personnel on proper handling and disposal of grease was issued to this restaurant. The fifth grease investigation was conducted in response to a report of grease accumulation in a line at the intersection of Adelaide Avenue and Broad Street in Providence. There were six restaurants, five permitted and one unpermitted, upstream of the impacted area. All five of the permitted restaurants were maintaining their grease removal units. However, one of these restaurants was not maintaining a logbook. A Notice of Violation was issued to this restaurant. The unpermitted restaurant was required to install grease removal equipment and obtain a Wastewater Discharge Permit. The sixth grease investigation was conducted in response to a report stating a line on Broad Street in Providence was flowing slowly due to grease accumulation. There were six restaurants upstream of the impacted area. Five of the six restaurants were permitted. Three of the permitted restaurants were in compliance with their permits and maintaining their grease removal units. The remaining two permitted restaurants were maintaining their grease removal units but were not maintaining logbooks. These two restaurants were issued Notices of Violation. The unpermitted restaurant was in the process of obtaining a permit. Its grease removal unit was operational and a logbook was being maintained. The seventh grease investigation was conducted as a result of a report of grease accumulation in a line on Cranston Street in Providence. There were three facilities with the potential to discharge grease laden wastewater upstream of the impacted area. All three facilities were permitted. The three facilities were in compliance with their permits and maintaining their grease removal equipment. The final grease investigation was conducted as a result of a report of grease accumulation in the line on Broad Street in Providence. There was only one restaurant upstream of the impacted area. This restaurant was permitted. The inspection of the restaurant revealed its grease removal units were not operable. A Notice of Violation requiring the grease removal units to be repaired was issued to the restaurant.

Pass-through and Interference

During 2016 the Pretreatment Section conducted 20 special or emergency investigations within the Field's Point and Bucklin Point districts. All reports of spills, dumping activities, unusual influents, and other related incidents during 2016 were thoroughly investigated. It is not known at the onset of an unusual influent report if the influent pollutant will cause interference with either mechanical equipment or with the microbial organisms utilized at the treatment facilities to break down the sanitary waste. Nonetheless, each report must be investigated to ensure that the unusual influent does not cause interference with NBC operations, pass through the facility into the receiving waters, or cause a discoloration of the receiving body of water, all of which would result in NBC being in violation of its RIPDES permits. None of the unusual influent incidents, dumping reports or spills investigated during 2016 resulted in interference or pass-through situations at either of the NBC wastewater treatment facilities. This is a testament to the excellent job done daily by the NBC to control the discharge of toxic and nuisance pollutants.

IV. COMPLIANCE MONITORING

Compliance Monitoring

The Narragansett Bay Commission utilizes two types of industrial and commercial user monitoring to determine compliance with effluent discharge limitations. These are:

- User Self-Monitoring;
- Compliance monitoring conducted by NBC personnel.

A description of both types of monitoring is provided in the following sections.

User Self-Monitoring

User self-monitoring is sampling conducted by an industrial or commercial user in accordance with the terms of their permit. The frequency of self-monitoring required by the permit may vary from once every twelve months (one time per year) to once per month (twelve times per year) depending on the nature and volume of the wastewater discharges. In some cases, permits may require compliance monitoring of each facility discharge. The frequency of self-monitoring is automatically increased to weekly when a user fails to meet discharge limitations by self-monitoring or by NBC sampling results. Once the user has demonstrated full compliance during four consecutive sampling events, the user is returned to the monitoring frequency specified in the permit.

User self-monitoring must be conducted in accordance with federal pretreatment requirements as specified in 40CFR§403 and analytical techniques specified in 40CFR§136. A Certification of Analysis (COA) detailing the results must be submitted with a properly completed Self-Monitoring Compliance Report (SMCR) form and Chain of Custody (COC) documentation. The SMCR requires the user to review the analytical results prior to submittal, to notify the NBC of any violation within twenty-four (24) hours of becoming aware of the violation and to enter the analytical report identification number on the SMCR. The SMCR notifies the users of the NBC requirement to resample their wastewater for any parameters violating standards. This resampling must be done and results submitted within thirty (30) days of becoming aware of the violation. The SMCR also requires the user to notify the NBC of the reasons for the violation and the steps and time frame necessary to correct the violations. This form must be signed by an authorized agent of the company. A sample SMCR is provided in ATTACHMENT VOLUME I, SECTION 3.

In 1993, Pretreatment staff developed the 24 Hour Violation Notification Fax form so that the user could quickly report an effluent violation to the NBC. This form also provides a good file record that the proper NBC violation notification requirement was satisfied by the user. A sample 24 Hour Violation Notification Fax form is provided in ATTACHMENT VOLUME I, SECTION 3.

Samples collected by industrial and commercial users can be either composite samples or grab samples. Composite samples consist of a number of samples taken over a period of time that are combined. Most permit sampling consists of composite samples.

Grab samples consist of a single sample taken at one point in time. This type of sample is typically used to monitor the pollutant concentrations of batch discharges from facilities and to ensure that wastewater discharged on a batch basis is receiving proper pretreatment. A batch discharge usually occurs from one tank over a short period of time.

Many users are required to perform both composite and grab sampling of their discharges. Composite samples are collected from the continuous final effluent and grab samples are collected from batch treatment tanks and/or small process tanks that are batch discharged to the final discharge point. Composite sample results are evaluated for compliance with the NBC discharge limitations shown in TABLE 12. This table indicates the discharge standards that must be maintained by users located in the Field's Point and Bucklin Point districts. Batch discharges are evaluated for compliance by means of a concentrated discharge formula. This formula is based on the allowable mass loading from a facility and is essentially equivalent to the EPA combined wastestream formula.

In addition to regular wastewater sampling, many industrial users, including all electroplaters and metal finishers, are required to continuously record the pH of the effluent discharged from their firm. These users are required to submit a monthly pH Monitoring Report summarizing the maximum, minimum, and average pH values for each day of operation. The pH Monitoring Report form requires the user to certify that the data reported to the NBC was taken directly from the pH recording chart and is reported to an accuracy of 0.1 standard units. Firms that discharge wastewater on a batch basis must record the final pH of the batch prior to discharge. This data must also be reported monthly. The NBC Batch and Continuous pH Monitoring Report forms are provided in ATTACHMENT VOLUME I, SECTION 3.

NBC Industrial User Sampling Program

EMDA staff conducts compliance monitoring of industrial and commercial facilities to assess users compliance status and to verify the validity of user self-monitoring results. Sampling is conducted inside the facility and is random and unannounced. A chain of custody procedure is used which includes completion of a chain of custody document. Sample bottles are sealed with bottle sealing tape to prevent tampering after sampling and preservation has been completed. A sample submission sheet is completed by EMDA staff conducting the sampling and specifies the exact sampling procedure to be implemented, the laboratory analysis requested to be conducted, facility water consumption data, sample preservation documentation and a certification of split sample acceptance or refusal signed by the user. Copies of these sampling and chain of custody documents are provided in ATTACHMENT VOLUME I, SECTION 3.

TABLE 12

NBC FIELD'S POINT EFFLUENT DISCHARGE LIMITATIONS*
(Providence, North Providence, Johnston, small sections of Lincoln and Cranston)

Parameter	Maximum Daily (Composite daily for 1 day)	Average (10 day)
Cadmium (Total)	0.11	0.07
Chromium (Total)	2.77	1.71
Copper (Total)	1.20	1.20
Cyanide (Total)	0.58	0.58
Lead (Total)	0.60	0.40
Mercury (Total)	0.005	0.005
Nickel (Total)	1.62	1.62
Silver (Total)	0.43	0.24
Zinc (Total)	2.61	1.48

Parameter	Limitation (Max.)
Total Toxic Organics (TTO)	2.13
Biochemical Oxygen Demand (BOD)	300.00**
Total Suspended Solids (TSS)	300.00**
Total Oil and Grease (Fats, Oil and Grease)	125.00
Oil and Grease (Mineral Origin)	25.00
Oil and Grease (Animal/Vegetable Origin)	100.00
pH range (at all times)	5.0 - 11.0 standard units

NBC BUCKLIN POINT EFFLUENT DISCHARGE LIMITATIONS*
(Pawtucket, Central Falls, Lincoln, Cumberland, Rumford Section of East Providence, and the Eastern Section of Smithfield)

Parameter	Maximum Daily (Concentration Limit mg/l)	Monthly Average (Concentration mg/l)
Arsenic (Total)	0.20	0.10
Cadmium(Total)	0.11	0.07
Chromium (Total)	2.77	1.63
Copper (Total)	1.20	1.20
Cyanide (Total)	0.50	0.50
Lead (Total)	0.69	0.29
Mercury (Total)	0.06	0.03
Nickel (Total)	1.62	1.62
Selenium (Total)	0.40	0.20
Silver (Total)	0.40	0.20
Tin (Total)	4.00	2.00
Zinc (Total)	1.67	1.39

Parameter	Limitation (Max.)
Total Toxic Organics (TTO)	2.13
Biochemical Oxygen Demand (BOD)	300.00**
Total Suspended Solids (TSS)	300.00**
Total Oil and Grease (Fats, Oil and Grease)	125.00
Oil and Grease (Mineral Origin)	25.00
Oil and Grease (Animal/Vegetable Origin)	100.00
pH range (at all times)	5.0 - 11.0 standard units

***** **All limitations are in units of mg/l unless otherwise specified.**

****** **Exceeding these limitations may be permitted but exceedance may be subject to surcharge in accordance with rates approved by the Public Utilities Commission and R.I.G.L. §39-1-1-1 et seq.**

EMDA utilizes many controls to insure the legal integrity of the samples collected for compliance and enforcement monitoring. Quality Assurance and Quality Control (QA/QC) begins with the purchase of materials. The sample bottles purchased are high quality and pre-cleaned. New bottles are purchased and utilized for each sampling event and all old bottles are discarded. Only the bottles used in automatic samplers and cyanide sample bottles are washed and reused by NBC staff. Preservatives purchased are reagent grade with ultra low levels of impurities.

Standard Operating Procedures (SOP) have been established for glassware and equipment cleaning. These were developed in accordance with EPA established protocols. A copy of the SOP Manual is kept in each EMDA field laboratory at all times for reference. The procedures include specific information relative to the types of chemicals used, such as phosphate free detergents, deionized water, types and strengths of acids, and solvents. EMDA sampling equipment and protocols were modified to satisfy EPA Clean Sampling requirements.

A logbook is maintained for each automatic sampler to document all usage, cleaning and repairs, as well as all preventive maintenance. All sample lines are prepared in the same manner as sample containers. Acids used in this process are also periodically analyzed for contaminants. A blank water sample of the sampler hose and pump lines is collected and preserved upon completion of the cleaning process. This blank is submitted to the laboratory with the samples that are collected with that sampler. In addition, the deionized water system used by EMDA is checked each week at the ppb level to ensure the integrity of the final deionized water rinse.

Whenever the NBC conducts user sampling, the user is offered a replicate sample that they may have analyzed by an independent laboratory for comparison with the NBC results. The user is notified of the NBC results as soon as they are reported by the NBC Laboratory.

In addition to compliance monitoring inside the industrial and commercial user facilities, the NBC also monitors manholes strategically located throughout the sewer system on a regular basis. The purpose of this manhole monitoring is to track spills, concentrated or non-compliant discharges, and to monitor users without them being aware that sampling is being conducted.

NBC Laboratory Building

The majority of samples collected in 2016 by EMDA were analyzed at NBC Laboratory facilities at Field's Point. The NBC laboratory utilizes state of the art wastewater analytical equipment that is able to comply with the most stringent EPA and RI Department of Health (DOH) regulations that call for sensitive detection of various materials contained in wastewater.

During 2016 the NBC completed construction of the Water Quality Science Building (WQSB). This is a state of the art building that houses the Environmental Monitoring & Data Analysis (EMDA) and Laboratory sections. These two sections work together to ensure that samples are collected and processed in accordance with all EPA protocols.

Water Quality Science Building

EMDA Lab Area

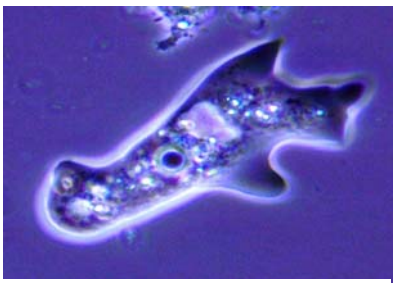
The EMDA laboratory section of the building has been designed to include separate areas for plant sampling work, industry and manhole sampling, nutrient sampling and, fixed site sonde maintenance work. Preparation and cleaning of sampling equipment and bottles for these different sampling initiatives is performed in segregated areas to minimize the risk of equipment cross contamination. In addition, EMDA staff has work stations in order to prepare required paperwork for sample collection.

Analytical Laboratory

The EPA has outlined several analyses that require ultra low level detection. These analyses are for trace metals utilizing an inductively coupled plasma/mass spectrometer (ICP/MS), mercury using a cold vapor atomic fluorescence spectrometer, and cyanide. To achieve these ultra low levels, the instruments must be kept in an environment free of contaminants. The major contaminant of concern is metals. The WQSB has been designed to allow for samples to flow smoothly through the lab. The WSQB has been equipped with state of the art instrumentation. The building is equipped with an advanced class 10,000 clean room. The class 10,000 clean room is used to process ultra low level metal samples and ultra low level mercury samples. Fume hoods in the lab clean room are clean classified as approaching Class 1000 Clean Room Criteria. This means that there is very minimal exposed metal in this area. Everything in this area from the light fixtures to the door jambs are coated or made of a non-metallic material and all air is processed through HEPA filters. The biology labs have also expanded. There are now two labs utilized for microbiology analysis. This expanded area will allow the NBC to process the enterococcus samples required by the new RIPDES permits.

ICP used at the NBC Laboratory

There are separate areas of the laboratory designated for digestion of metals, metals analysis on the ICP and metals analysis on the mercury analyzer. The mercury analyzer uses EPA Method 245.7 and currently has a detection limit of 2.0 parts per trillion (ppt). This detection limit is expected to improve as protocols for this equipment are further refined. The ultimate goal is to use EPA Method 1631 for the measurement of total mercury, with an estimated method detection limit of 0.05 ppt and minimum reporting limit (ML) of 0.2 ppt. The ICP/MS is used for ultra-trace multi-elemental analysis. The method used is EPA Method 200.8 for trace metals at EPA Water Quality Criteria levels.



Amoeba

The Laboratory has a microbiology department dedicated to fecal coliform and various other bacterial analysis. A microscope, camera, and monitor are some of the tools used in the “Micro” room. There is also a room specifically used for making media, which is the material used to promote bacteria growth. The use of a separate room for media preparation is important to control contamination. To accommodate the projects conducted by NBC and to satisfy EPA regulations, it is vital to properly maintain and continuously improve the NBC Laboratory.

The Laboratory section has been designed with features that conserve energy and promote work efficiencies. The ventilation fume hoods function by increasing in velocity as the enclosure sashes are opened and decreasing in velocity as the enclosure sashes are closed. Other design features include motion sensor lighting in every lab area, relative humidity control, and a temperature monitoring system to monitor biological sample and preserved analytical sample temperatures.

Between the period of January 1, 2016 through December 31, 2016, NBC personnel conducted 188 sampling inspections of industries located within the NBC Field's Point and Bucklin Point districts, resulting in the collection of 1,761 composite and grab samples. These 1,761 samples translated to 194 monitoring reports. Of these 194 monitoring reports, 175 were in full compliance with the NBC standards and 19 were not in compliance, resulting in a user compliance rate of 90.2% based upon NBC analyses. This is an increase from the 88.4% rate of compliance reported for 2015 NBC monitoring results.

The NBC conducted sampling of 69 SIUs and seven non-significant user facilities in the two NBC districts during 2016. Of the 76 facilities sampled by the NBC, 45 facilities were classified as categorical industries at the time of the sampling event. There were 24 firms classified as significant non-categorical facilities when sampled by the NBC during 2016.

Computer printouts of the 2016 sampling results for significant and non-significant users, separated by district, are provided in ATTACHMENT VOLUME II, SECTIONS 5 and 6 respectively. NBC analyses are indicated by a "Y" in the printout. These printouts list cadmium, chromium, copper, lead, nickel, silver, zinc, cyanide, BOD, TSS, Oil and Grease, and other categorical parameters specific to the user. The compliance status of each result is also indicated.

Analysis of Monitoring Results

NBC permits required industrial and commercial users to submit 1,884 wastewater monitoring reports for the period from January 1, 2016 through December 31, 2016. For this period, the industrial and commercial users actually submitted 2,466 sample results, 2,336 of which were in full compliance with NBC and EPA standards. This is a user self monitoring report rate of compliance of 94.7%. The users submitted 30.9% more analyses than required by permits due to the NBC requirement to conduct weekly sampling once non-compliance has occurred.

TABLE 13 provides a summary of the batch and non-batch compliance monitoring results for categorical and non-categorical industries located in both NBC districts for the period from January 1, 2016 through December 31, 2016. TABLE 14 provides a summary of the batch and non-batch compliance monitoring results for the significant and non-significant industrial users. The data reported in TABLES 13 and 14 is shown graphically in FIGURES 8 and 9. TABLE 15 is a comparison of the percent compliance for both self-monitoring and NBC sampling results for the aforementioned period. This table indicates that there may be inconsistencies between NBC and user sampling results. While user self-monitoring compliance reports submitted by significant users indicate a compliance rate of 95.1%, NBC results indicate a compliance rate of 89.0% for this class of users.

TABLE 13

Narragansett Bay Commission
Field's Point and Bucklin Point Districts

Summary of All Compliance Monitoring Results for Categorical and Non-Categorical Users

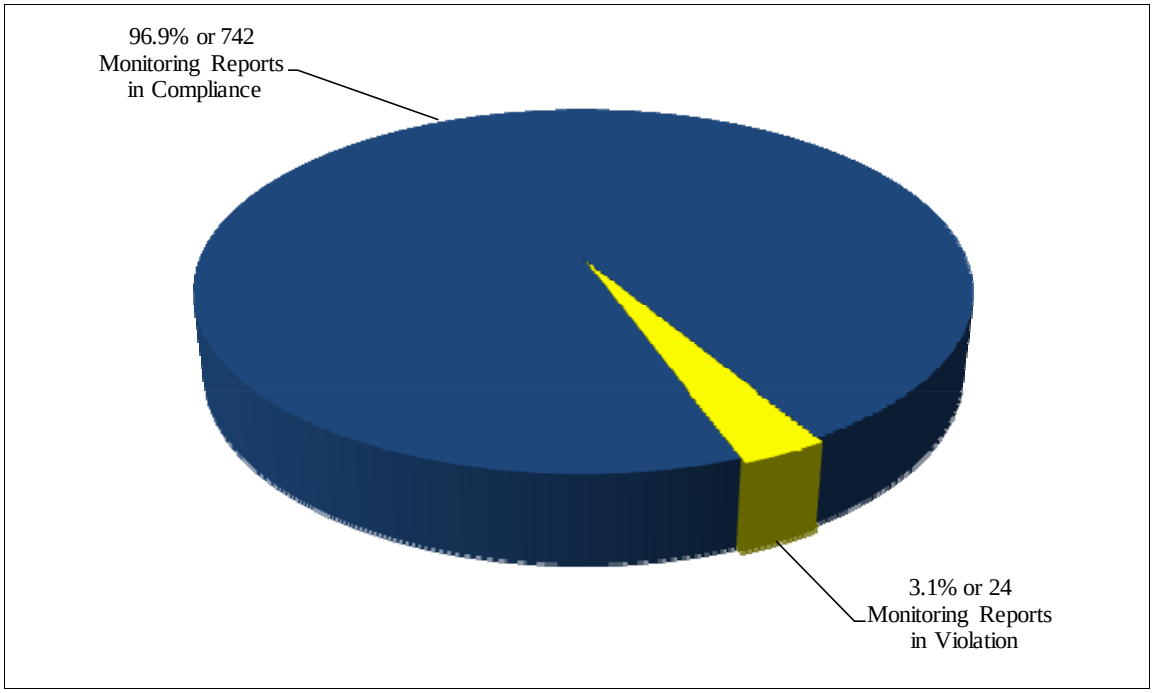
January 1, 2016 - December 31, 2016

User Self-Monitoring Results	**Categorical**	**Non-Categorical**	**Totals**
Total Monitoring Reports Required	**559**	**1,325**	**1,884**
Total Monitoring Reports Submitted	**658**	**1,808**	**2,466**
Total Monitoring Reports In Compliance	**645**	**1,691**	**2,336**
Total Monitoring Reports Not In Compliance	**13**	**117**	**130**
NBC Monitoring Results			
Total Monitoring Reports Collected	**108**	**86**	**194**
Total Monitoring Reports In Compliance	**97**	**77**	**174**
Total Monitoring Reports Not In Compliance	**11**	**9**	**20**
All Results			
Total Monitoring Reports Reviewed	**766**	**1,894**	**2,660**
Total Monitoring Reports With Violations	**24**	**126**	**150**
Total Monitoring Reports In Compliance	**742**	**1,768**	**2,510**
Total Users Sampled	**45**	**497**	**542**
Total Users With Violations	**13**	**37**	**50**
Total Users Without Violations	**32**	**460**	**492**

FIGURE 8

2016 Rates of Compliance for Categorical and Non-Categorical Users Field's Point & Bucklin Point Districts

Categorical User Analyses
Total Number of Monitoring Reports = 766



Non-Categorical User Analyses
Total Number of Monitoring Reports = 1,894

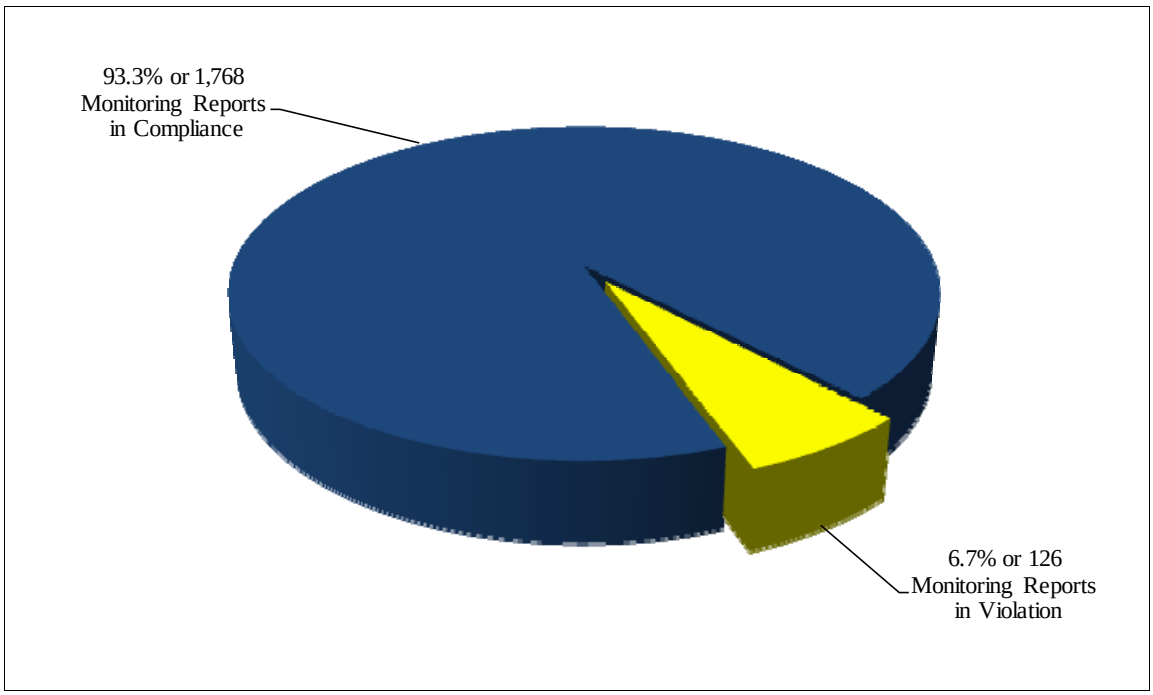


TABLE 14

Narragansett Bay Commission
Field's Point and Bucklin Point Districts

Summary of All Compliance Monitoring Results for Significant and Non-Significant Users

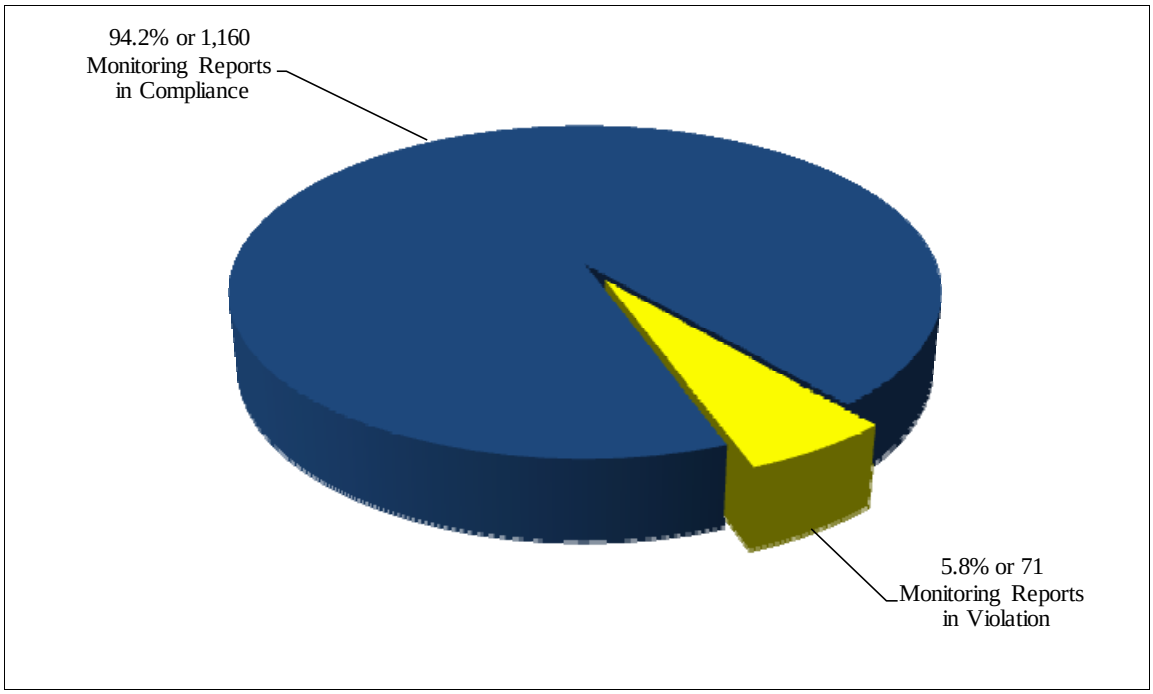
January 1, 2016 - December 31, 2016

User Self-Monitoring Results	Significant Users	Non-Significant Users	Totals
Total Monitoring Reports Required	**750**	**1,134**	**1,884**
Total Monitoring Reports Submitted	**1,050**	**1,416**	**2,466**
Total Monitoring Reports In Compliance	**999**	**1,337**	**2,336**
Total Monitoring Reports Not In Compliance	**51**	**79**	**130**
NBC Monitoring Results			
Total Monitoring Reports Collected	**181**	**13**	**194**
Total Monitoring Reports In Compliance	**161**	**13**	**174**
Total Monitoring Reports Not In Compliance	**20**	**0**	**20**
All Results			
Total Monitoring Reports Reviewed	**1,231**	**1,429**	**2,660**
Total Monitoring Reports With Violations	**71**	**79**	**150**
Total Monitoring Reports In Compliance	**1,160**	**1,350**	**2,510**
Total Users Sampled	**70**	**472**	**542**
Total Users With Violations	**20**	**30**	**50**
Total Users Without Violations	**50**	**442**	**492**

FIGURE 9

2016 Rates of Compliance for Significant and Non-Significant Users
Field's Point & Bucklin Point Districts

Significant User Analyses
Total Number of Monitoring Reports = 1,231



Non-Significant User Analyses
Total Number of Monitoring Reports = 1,429

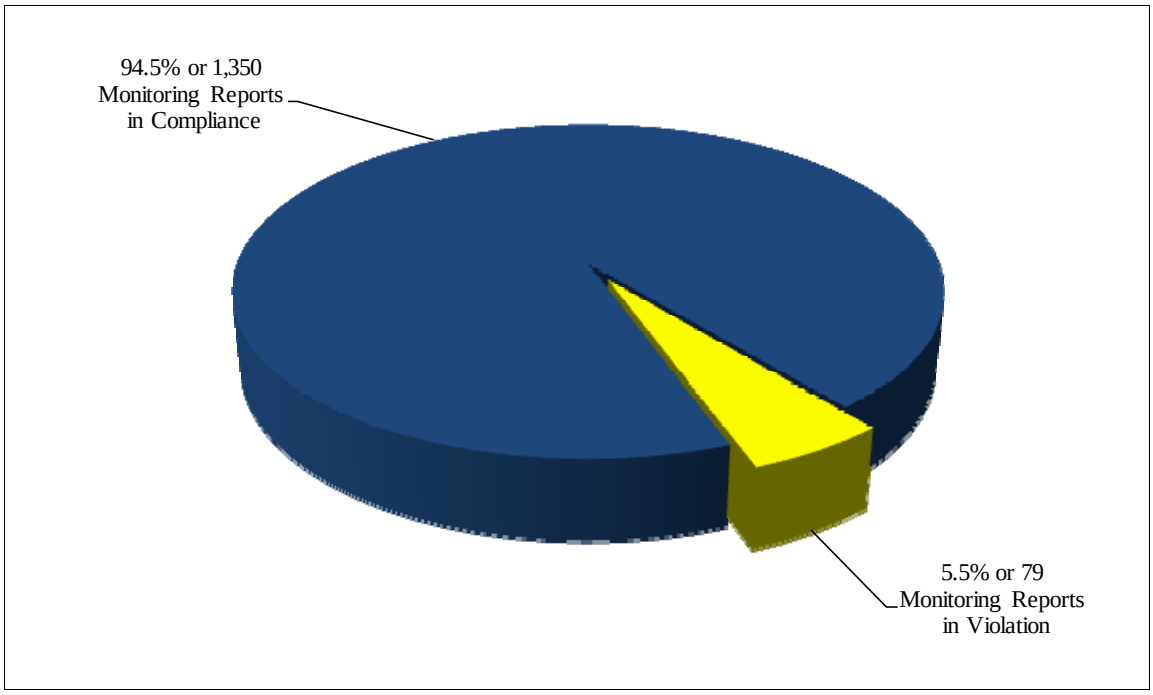


TABLE 15

Narragansett Bay Commission
Field's Point and Bucklin Point Districts

Comparison of Compliance Rates for Self-Monitoring and NBC Monitoring Reports

January 1, 2016 - December 31, 2016

	User Self-Monitoring	NBC Monitoring	All Results
Significant Users			
Compliance Rate	**95.1%**	**89.0%**	**94.2%**
Non-Compliance Rate	**4.9%**	**11.0%**	**5.8%**
Non-Significant Users			
Compliance Rate	**94.4%**	**100%**	**94.5%**
Non-Compliance Rate	**5.6%**	**0%**	**5.5%**
Categorical Users			
Compliance Rate	**98.0%**	**89.8%**	**96.9%**
Non-Compliance Rate	**2.0%**	**10.2%**	**3.1%**
Non-Categorical Users			
Compliance Rate	**93.5%**	**89.5%**	**93.3%**
Non-Compliance Rate	**6.5%**	**10.5%**	**6.7%**
All Users			
Compliance Rate	**94.7%**	**89.7%**	**94.4%**
Non-Compliance Rate	**5.3%**	**10.3%**	**5.6%**

This data review indicates the overall SIU compliance rate remained virtually unchanged based upon user monitoring and NBC results when compared to the previous reporting year, as the overall SIU rate of compliance was 93.0% in 2015 and 94.2% in 2016. There was only a 6.1% difference in significant industrial user compliance rates observed between user and NBC

sampling results. The difference in compliance rates observed for categorical users for these two types of effluent monitoring was greater at 8.2%. User self monitoring reports submitted by categorical users indicated full compliance 98.0% of the time, while NBC monitoring found categorical users to be in compliance for only 89.8% of NBC sampling events. These differences in NBC and user monitoring compliance rates indicate that some users may not be properly collecting samples or reporting results that may not be truly representative of the quality of their effluent discharge and may even indicate that some firms may be falsifying monitoring reports. The NBC aggressively investigates these discrepancies through its industry and manhole sampling programs. It is important to note, however, that the rate of compliance for both monitoring methods is quite high. The comparison of compliance rates of the different classes of users for user self-monitoring and NBC monitoring reports is presented in FIGURE 10.

FIGURE 10
2016 Comparison of Compliance Rates for
Self-Monitoring and NBC Monitoring Reports

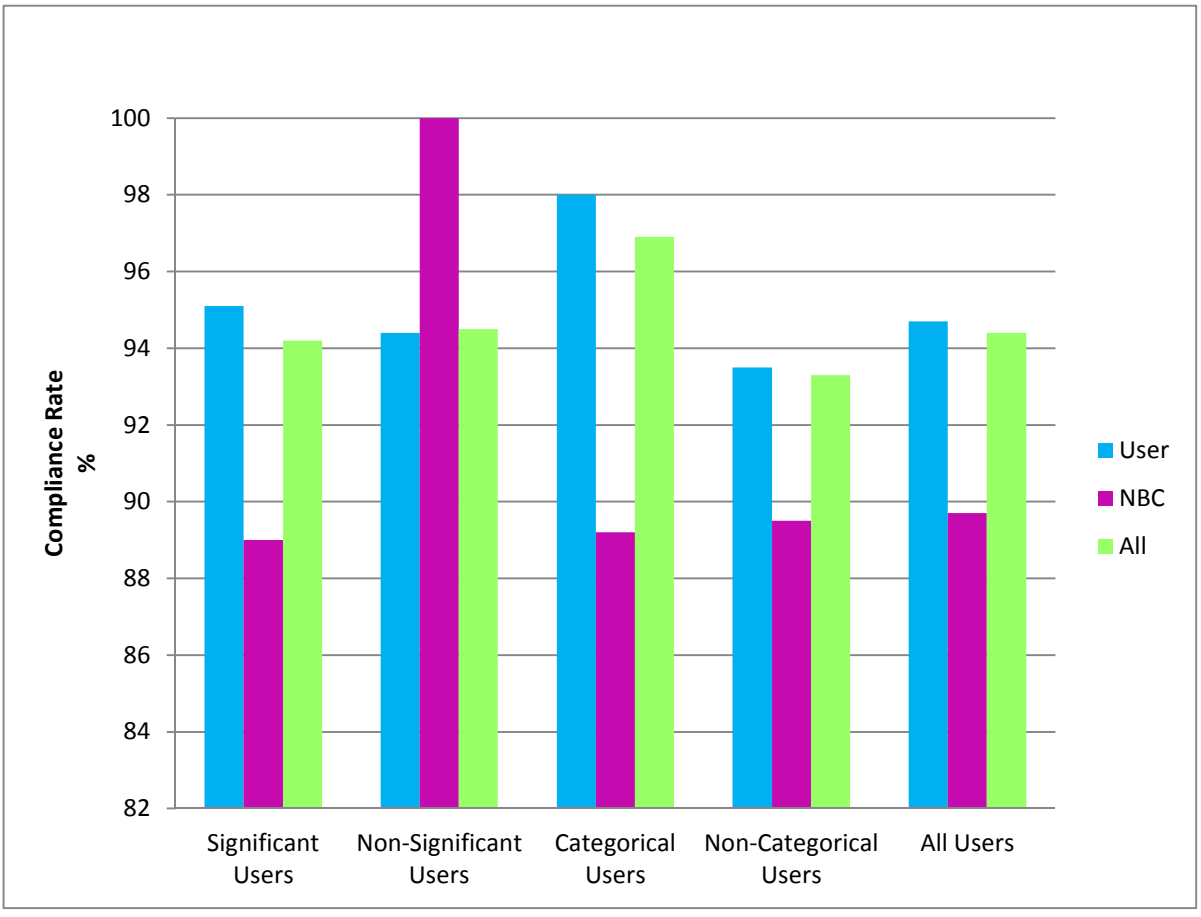


TABLE 16 provides a comparison of the compliance rates for different classes of users located in the Field's Point and Bucklin Point districts. The compliance rates for each class of users in both districts were similar. The overall rate of compliance for Field's Point users was 94.0%, while it was 95.0% in Bucklin Point.

The Field's Point categorical users were in full compliance for 97.4% of the sampling events at their facilities in 2016. This compliance rate is an increase from the 95.5% compliance rate in 2015. The Bucklin Point categorical users were in full compliance for 96.3% of the sampling event at their facilities in 2016. This compliance rate is an increase from the 93.2% in 2015. SIUs in the Field's Point district had a rate of compliance of 95.6%, slightly higher than the 92.7% SIU compliance rate observed in the Bucklin Point district.
As can be seen from TABLE 16, non-significant users in Bucklin Point had the highest rate of compliance, 97.8%, while significant users located in the Bucklin Point district had the highest rates of non-compliance, 7.3%. The rate of user compliance for all users in both districts slightly increased to 94.4% in 2016 when compared to 2015, at 93.7%.

TABLE 16
Narragansett Bay Commission

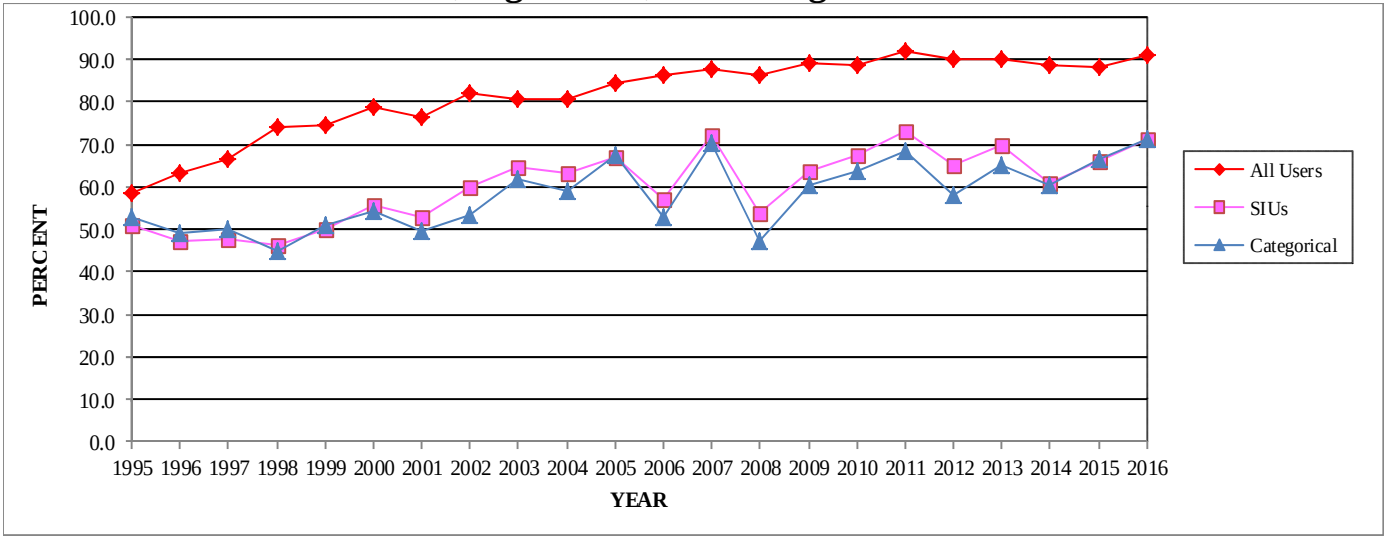
Comparison of Compliance Rates Between Field's Point and Bucklin Point Districts for All Monitoring Results

January 1, 2016 - December 31, 2016

	Field's Point District	Bucklin Point District	Both Districts
Significant Users			
Compliance Rate	**95.6%**	**92.7%**	**94.2%**
Non-Compliance Rate	**4.4%**	**7.3%**	**5.8%**
Non-Significant Users			
Compliance Rate	**92.9%**	**97.8%**	**94.5%**
Non-Compliance Rate	**7.1%**	**2.2%**	**5.5%**
Categorical Users			
Compliance Rate	**97.4%**	**96.3%**	**96.9%**
Non-Compliance Rate	**2.6%**	**3.7%**	**3.1%**
Non-Categorical Users			
Compliance Rate	**92.8%**	**94.3%**	**93.3%**
Non-Compliance Rate	**7.2%**	**5.7%**	**6.7%**
All Users			
Compliance Rate	**94.0%**	**95.0%**	**94.4%**
Non-Compliance Rate	**6.0%**	**5.0%**	**5.6%**

TABLE 17 provides an analysis of the percentage of firms in each user class with perfect compliance records for effluent monitoring occurring during 2016. This analysis indicates that 71.1% of categorical users and 71.4% of significant users had perfect compliance records for all effluent parameters and sampling events. The compliance rates for both of these user classes increased when compared to 2015, which were 66.7% and 65.8% respectively. Non-significant users had the highest percentage of firms with perfect compliance records, 93.6%. During 2016, of the 542 firms that sampled their waste stream, 492 firms or 90.8% of users were in full compliance with NBC and EPA discharge standards. This analysis excludes the pH parameter and only reviews compliance with toxic pollutant discharge parameters. The perfect compliance rate for each year since 1995 is presented in FIGURE 11. The rate of all users with perfect compliance for effluent monitoring has shown marked improvement over the years. In 1995 the overall rate of compliance for all users was 58.7% compared with 90.8% in 2016.

FIGURE 11
Rate of Perfect Compliance with Effluent Parameters for All Users, Significant, and Categorical Users



The increase in user compliance rates from 1995 through 2016 can be attributed to NBC resampling requirements, open and prompt communications with users and to educational efforts by the Pretreatment and ESTA staff regarding EPA and NBC requirements. In addition to educating users, ESTA staff offer free assistance to companies to resolve compliance issues. The NBC user education and technical assistance programs have resulted in significantly improved rates of compliance by NBC users.

TABLE 17

Narragansett Bay Commission

Analysis of Percentage of Firms With and Without Effluent Violations* for Various User Classes Field's Point and Bucklin Point Districts

January 1, 2016 - December 31, 2016

	% Firms Without Effluent Violations*	% Firms With Effluent Violations
Categorical Users	**71.1%**	**28.9%**
Non-Categorical Users	**92.6%**	**7.4%**
Significant Users	**71.4%**	**28.6%**
Non-Significant Users	**93.6%**	**6.4%**
All Users	**90.8%**	**9.2%**

***Excludes pH Parameter Violations.**

Of the 2,660 analytical reports reviewed during 2016, there were 150 reports that indicated non-compliance with one or more of the NBC or EPA effluent parameters (excluding pH). Of these 150 non-compliant sample reports, 71 were of samples collected from 20 SIU facilities and 79 non-compliant samples were collected from 30 non-significant facilities.

Four of the 20 SIUs that had effluent violations during 2016 had five or more effluent parameter violations during the report period. In fact, of the 4,932 various pollutant parameters tested for by SIUs, these four firms were responsible for 52 parameter violations out of a total of 80 parameter violations reported by all significant users during 2016. These four firms accounted for 65.0% of all SIU parameter violations over the past year. As required by the EPA and DEM, the NBC has initiated some type of enforcement action against each of these firms. A listing of these four firms and the current status of each of these users is provided in TABLE 18.

TABLE 18

Narragansett Bay Commission

Status of Significant Users With 5 or More Parameter Violations

January 1, 2016 - December 31, 2016

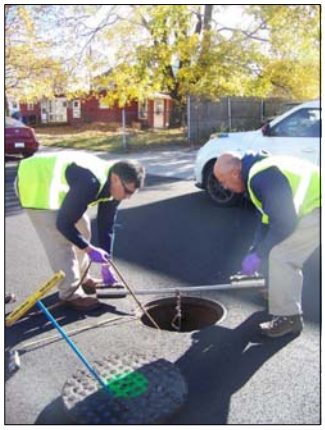
Company Name	Number of Parameter Violations	User Status
DFI-EP, LLC.	10	This Field's Point metal finishing firm experienced one chromium violation, one copper violation, three nickel violations, three zinc violations and two cyanide violations during 2016. The firm was issued an Administrative Order (AO) in January 2016 for metals and cyanide violations that occurred from May 2014 through December 2015. The firm attributed the violations cited in the AO as well as the violations that occurred in 2016 to poor house keeping practices. As a result of the AO the company made repairs to the pretreatment system and piping in the facility and improved house keeping practices. In addition the firm cleaned up the facility and shipped the material off site. A Consent Order was negotiated and executed in October. The company completed all required resampling and is now in compliance. Additional information on the AO can be found in CHAPTER VI.

Ecological Fibers, Inc.	22	This Bucklin Point printing firm experienced 22 zinc violations. Twenty violations occurred during routine sampling and resampling by the company, while the other two violations occurred during NBC sampling events. This firm was issued an Administrative Order (AO) in September 2015 for numerous zinc violations. Throughout 2016 the firm investigated pretreatment technologies as well as implemented improved housekeeping methods. The firm determined the high zinc concentrations were contained in equipment wash water. The company has decided to ship this waste stream off site for disposal. Since implementing this practice the company has returned to compliance. The firm submitted monthly progress reports to the NBC while negotiating the AO. The case was settled and a Consent Order was issued in January 2017. Additional information on this AO can be found in CHAPTER VI.
G. Tanury Plating Company	5	This Field's Point metal finishing firm experienced two copper violations, one nickel violation and two cyanide violations. All of the violations occurred during NBC sampling events. The firm attributed the metals violations to poor maintenance of the ion exchange columns and the cyanide violations to a malfunctioning chemical feed pump. The pump has since been repaired. The firm was required to increase the frequency of the regeneration of the ion exchange columns. The required resampling has been completed and the firm is now in compliance with effluent discharge limitations.
Providence Specialty Products	15	This Field's Point cheese manufacturing firm experienced 15 oil and grease violations. The firm attributed the violations to increased production and not recapturing usable by-products that are high in milk fats. The firm began collecting the by-products and using them back in the process. The firm is in the process of completing the required resampling.

2016 Industrial User Compliance Status Summary

During 2016, the NBC continued to monitor and track the compliance status of all industrial users in both the Field's Point and Bucklin Point districts. Notices of Violation (NOV) were issued for all instances of non-compliance. A total of 1,878 NOV were issued in 2016. A table detailing each type of NOV issued to each firm can be found in ATTACHMENT VOLUME II, SECTION 8. A summary of the monthly compliance status for Significant Industrial Users can be found in ATTACHMENT VOLUME II, SECTION 5. A summary of NBC Enforcement Actions, including the penalties assessed, is also provided in CHAPTER VI.

Industrial Surveillance Manhole Monitoring Program

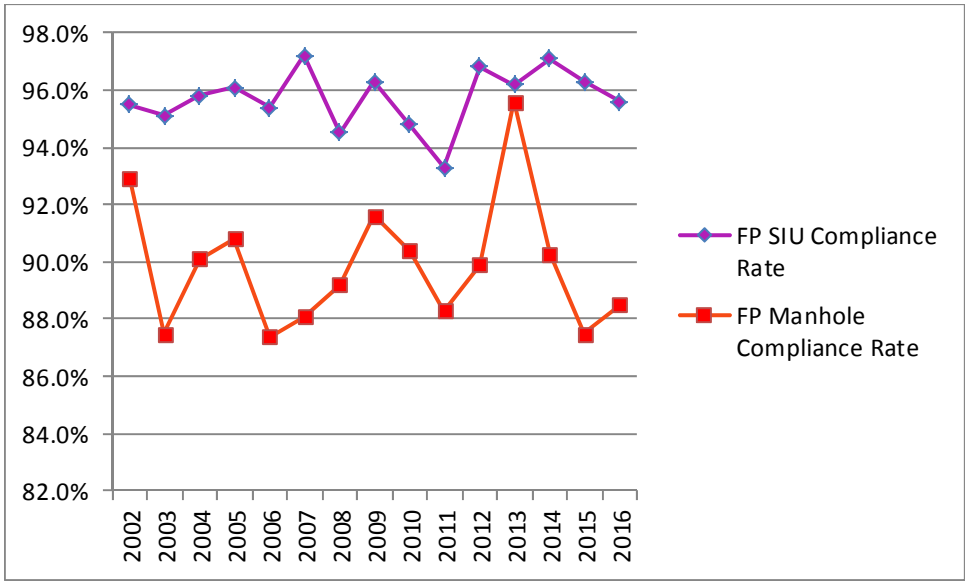


During 2016, EMDA staff conducted sampling of an average of six manholes each week. The automatic samplers for manholes are typically programmed to take a grab sample every 15 minutes over an approximately 24 hour period and utilize either one large bottle to obtain a single composite sample or a 24 bottle carrousel to obtain 24 discrete samples. For carrousel installations, 24 composite samples consisting of five grab samples per bottle are obtained over the 24 hour sampling period. EMDA staff analyzes each of the 24 sample bottles for pH and any unusual wastewater characteristics. Should any unusual conditions be observed, one or possibly all of the 24 samples would be analyzed separately. If no unusual characteristics are observed, an equal volume aliquot of each of the 24 samples is composited into two separate samples for laboratory analyses for metals and cyanide. After obtaining results indicating noncompliance, Pretreatment staff attempts to determine the potential source of these noncompliant discharges. Manhole monitoring results continue to indicate declines in the quantities of toxics discharged into the sewer system.

During 2016, the NBC conducted a total of 290 industrial manhole sampling events at manholes located throughout the two districts. In addition to collecting industrial manhole samples, 46 sampling events were conducted at residential manholes. In addition, sixteen additional manholes were attempted to be monitored in both Field's Point and Bucklin Point. However, due to flow conditions or mechanical problems, effluent could not be collected by the automatic samplers at these sites. A total of 336 monitoring events were conducted at manholes in 2016. This is a slight increase from the 329 monitoring events conducted at manholes in 2015.

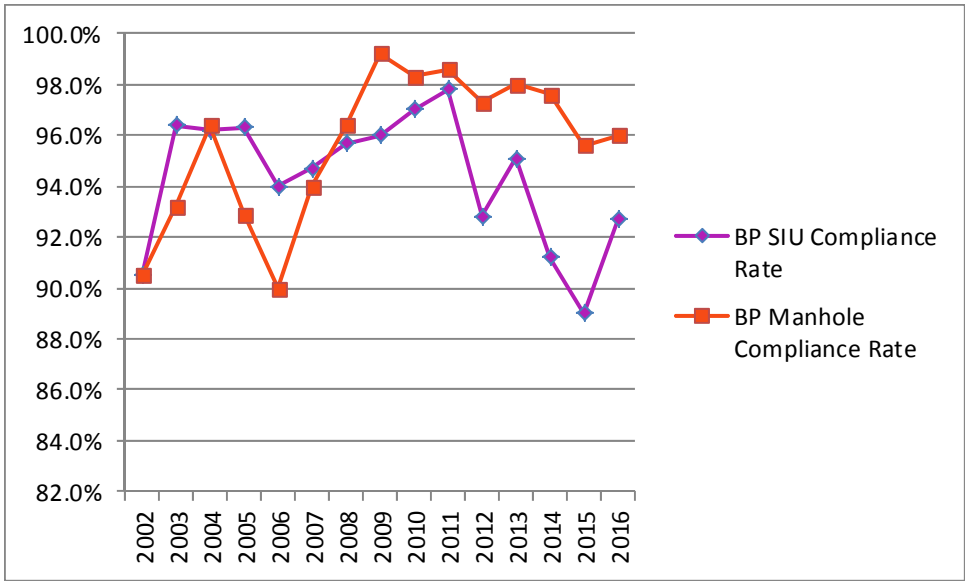
EMDA staff conducted 165 manhole monitoring events from industrial surveillance manholes in Field's Point during 2016. Of the 165 manhole monitoring events, 146 or 88.5% were in compliance with NBC discharge limitations. As can be seen in FIGURE 12 this compliance rate is slightly less than the compliance rate for sampling within Field's Point SIU facilities in 2016, which was 95.6%. Although there is a difference in compliance rates, the two are comparable. The lower compliance rate in manhole monitoring may be due to multiple industrial inputs into manholes as well as the contributions from background inputs such as inflow and infiltration and residential sources.

FIGURE 12
Field's Point SIU vs Manhole Compliance Rates 2002 - 2016



EMDA staff conducted 125 monitoring events from industrial surveillance manholes in Bucklin Point during 2016. Of the 125 manhole monitoring events, 120 or 96.0% of the events were in compliance with NBC discharge limitations. As can be seen in FIGURE 13 this compliance rate is slightly higher than the compliance rate for samples collected within Bucklin Point SIU facilities in 2016, which was 92.7%.

FIGURE 13
Bucklin Point SIU vs Manhole Compliance Rates 2002 – 2016



A discussion of the results of sanitary monitoring is provided in CHAPTER V of this report and a discussion of the manholes with elevated concentrations of toxics is provided in the following paragraphs. Industrial surveillance and sanitary manhole monitoring results for 2016 are provided in ATTACHMENT VOLUME II, SECTION 7.

INDUSTRIAL SURVEILLANCE MANHOLE VIOLATIONS

FIELD'S POINT DISTRICT

Industrial Surveillance Manholes 04A & 04B

Industrial Surveillance Manholes 04A and 04B are located on Chapman Street in Providence downstream and upstream of Armbrust International, Ltd., which conducts metal finishing operations. On November 17, 2016 the concentration of copper in Industrial Surveillance Manhole 04A was in excess of the NBC discharge limitation of 1.2 ppm. Industrial Surveillance Manhole 04B was not sampled during this monitoring event. The firm was inspected and nothing unusual was noted. Both surveillance manholes were resampled on December 22, 2016 and the results were in compliance for all parameters. Continued industrial manhole monitoring will be conducted by NBC personnel in 2017 to monitor the compliance status of this company.

Industrial Surveillance Manholes 08A & 08B

Industrial Surveillance Manholes 08A and 08B are located on Toronto Street in Providence downstream and upstream of Ira Green, Inc., which conducts metal finishing operations. On May 19, 2016 the concentration of copper in Industrial Surveillance Manhole 08A was in excess of the NBC discharge limitation of 1.2 ppm. The firm was issued a Notice of Violation which required a report detailing the cause of the high copper concentration to be submitted. The firm indicated that it could not determine a cause for the copper concentration. However, the firm retrained its workers and purchased a portable photometer to conduct spot checks of its waste stream. Continued industrial manhole monitoring will be conducted by NBC personnel in 2017 to monitor the compliance status of this company.

Industrial Surveillance Manholes 11B & 11C

Industrial Surveillance Manholes 11B and 11C are located on Toronto Street in Providence downstream and upstream of Monarch Metal Finishing Inc., which conducts metal finishing operations. On March 24, 2016 the concentration of copper in both Industrial Surveillance Manholes 11B and 11C were in excess of the NBC discharge limitation of 1.2 ppm. On June 16, 2016 and November 3, 2016, the concentration of copper in Industrial Surveillance Manhole 11C was in excess of the NBC discharge limitation of 1.2 ppm. The area upstream of these manholes was investigated to determine potential sources of copper. The facilities located upstream were found to not have process wastewater discharges to the sewer. Monarch Metal Finishing Inc. was inspected and nothing unusual was noted. Continued industrial manhole monitoring will be conducted by NBC personnel of these manholes in 2017 to monitor the compliance status of this area.

Industrial Surveillance Manholes 23A & 23B

Industrial Surveillance Manholes 23A and 23B are located on Public Street in Providence downstream and upstream of Ideal Plating & Polishing Company, Inc., which conducts metal finishing operations. On January 12, 2016 the concentration of copper in Industrial Surveillance Manhole 23A was in excess of the NBC discharge limitation of 1.2 ppm. The firm was issued a Notice of Violation which required a report detailing the cause of the high copper concentration to be submitted. The firm could not determine a cause for the elevated copper concentration. The firm retrained its platers and began monitoring of its dragout tanks for metals concentrations. Subsequent monitoring of these manholes indicated compliance with all NBC discharge limitations. Continued industrial manhole monitoring will be conducted by NBC personnel in 2017 to monitor the compliance status of this company.

Industrial Surveillance Manholes 53A & 53B

Industrial Surveillance Manholes 53A and 53B are located on Plymouth Street in Providence downstream and upstream of Surface Coatings Division, MFB LLC, which conducts metal finishing operations. On June 30, 2016 and October 6, 2016 the concentration of nickel in Industrial Surveillance Manhole 53A was in excess of the NBC discharge limitation of 1.62 ppm. The firm was issued Notices of Violation which required reports detailing the cause of the high nickel concentration to be submitted. The firm attributed both violations to employee error, and has indicated it would retrain its employees. Continued industrial manhole monitoring will be conducted by NBC personnel in 2017 to monitor the compliance status of this company.

Industrial Surveillance Manholes 69A & 69B

Industrial Surveillance Manholes 69A and 69B are located on Aurora Street in Providence downstream and upstream of Monarch Metal Finishing Company, which conducts metal finishing operations. On February 11, 2016 the concentration of copper in both Industrial Surveillance Manholes 69A and 69B was in excess of the NBC discharge limitation of 1.2 ppm. In addition, the concentration of nickel in Industrial Surveillance Manhole 69B was in excess of the discharge limitation 1.62 ppm. Since the exceedances were in the upstream manhole, the violations could not be attributed to the firm. The upstream manhole has very low flow and the cause of the exceedances was most likely due to grit being picked up in the sampler. Subsequent monitoring of these manholes indicated compliance with all NBC discharge limitations. Continued industrial manhole monitoring will be conducted by NBC personnel in 2017 to monitor the compliance status of this company.

Industrial Surveillance Manholes 70A, 70B & 70C

Industrial Surveillance Manholes 70A and 70B are located on River Avenue in Providence downstream and upstream of both A & F Plating Company and Universal Plating Company, Inc., both of which conducts metal finishing operations. Industrial Manhole 70C is located upstream of Universal Plating Company, Inc. and downstream of A&F Plating Company. On March 10, 2016 the concentrations of copper, nickel, and cyanide were in excess of the NBC discharge limitations of 1.20 ppm, 1.62 ppm, and 0.58 ppm respectively. Each firm was issued Notices of Violation requiring reports detailing the cause of the high metals and cyanide concentrations be

submitted. In addition, each facility was thoroughly inspected. A&F Plating Company had NBC Pollution Prevention visit their facility for guidance and indicated they would retrain and oversee platers. Universal Plating Company, Inc. inspected its facility to determine if there were any possible spills or leaks from plating baths or other tanks that could reach the sewer, but did not find anything. Subsequent monitoring of these manholes indicated compliance with all NBC discharge limitations. Continued industrial manhole monitoring and more frequent inspections will be conducted by NBC personnel in 2017 to monitor the compliance status of these companies.

Industrial Surveillance Manholes 111A & 111B

Industrial Surveillance Manholes 111A and 111B are located on Railroad Avenue in Johnston downstream and upstream of G. Tanury Plating Company, which conducts metal finishing operations. On January 28, 2016 the concentration of copper and nickel in Industrial Surveillance Manhole 111A was in excess of the NBC discharge limitation of 1.20 ppm and 1.62 ppm respectively. On June 6, 2016 the concentration of copper was in excess of the NBC discharge limitations. On October 13, 2016 the concentration of nickel was in excess of the NBC discharge limitation. In addition, the concentration of cyanide on October 13, 2016 was in excess of the NBC discharge limitation of 0.58 ppm. In each instance the firm was issued a Notice of Violation which required a report detailing the cause of the violations to be submitted. For the January 28, 2016 violation, the firm indicated operator error of the nickel recovery system was the cause of the nickel violation, and a new plater on a plating line was the cause of the copper violation. For the June 6, 2016 violation, the firm indicated that the copper ion exchange columns were overdue to be regenerated. Finally, for the October 13, 2016 violations, the firm attributed the cyanide violation to a malfunction in a metering pump in their cyanide destruct system, and attributed the nickel violation to the ion exchange columns needing regeneration. In each instance the firm indicated it would more closely monitor its ion exchange columns, metering pumps, and retrain employees. The firm was required to increase the frequency of ion exchange column regeneration. Continued industrial manhole monitoring will be conducted by NBC personnel in 2017 to monitor the compliance status of this company.

Industrial Surveillance Manholes 123A & 123B

Industrial Surveillance Manholes 123A and 123B are located on Starr Street in Johnston downstream and upstream of DiFruscia Industries, Inc., which conducts metal finishing operations. On January 21, 2016 the concentration of nickel in Industrial Surveillance Manhole 123A was in excess of the NBC discharge limitation of 1.62 ppm. The firm was issued a Notice of Violation which required a report detailing the cause of the high nickel concentration to be submitted. The firm indicated that it would retrain platers on proper procedures for discharging spent cleaners and seal tanks to treatment. Subsequent monitoring of these manholes indicated compliance with all NBC discharge limitations. Continued industrial manhole monitoring will be conducted by NBC personnel in 2017 to monitor the compliance status of this company.

Industrial Surveillance Manholes 153A & 153B

Industrial Surveillance Manholes 153A and 153B are located on Waterman Avenue in North Providence upstream and downstream of DFI-EP, LLC, which conducts metal finishing operations. On January 28, 2016 the concentration of zinc was in excess of the NBC discharge limitation of 2.61 ppm. The firm was issued a Notice of Violation which required a report detailing the cause of the high zinc concentration to be submitted. The firm attributed the violation to a leak in a zinc dragout tank. Subsequent monitoring of these manholes indicated compliance with all NBC discharge limitations. The firm was issued an Administrative Order (AO) in January, 2016 for numerous violations of NBC discharge limitations. As a result of the AO, the firm repaired piping and its pretreatment system. The firm also improved house keeping within the facility. NBC staff trained DFI-EP staff on the impacts of metal finishing wastes on the sewer system. Additional information on the AO can be found in CHAPTER VI. Continued industrial manhole monitoring will be conducted by NBC personnel in 2017 to monitor the compliance status of this area and company.

BUCKLIN POINT DISTRICT

Industrial Surveillance Manholes 14A & 14B

Industrial Surveillance Manholes 14A and 14B are located on Dexter Street in East Providence, upstream and downstream of Aspen Aerogels Rhode Island, LLC, which manufactures aerogel insulation. On January 7, 2016 the concentration of zinc in Industrial Surveillance Manhole 14A was in excess of the NBC discharge limitation of 2.61 ppm. Since the manhole is located upstream of the firm, a Notice of Violation was not issued as the firm was determined to not be the source. The area upstream was investigated and no potential sources of the zinc could be identified. Subsequent monitoring of these manholes indicated compliance with all NBC discharge limitations. Continued industrial manhole monitoring will be conducted by NBC personnel in 2017 to monitor the compliance status of this area.

Industrial Surveillance Manholes 92A & 92B

Industrial Surveillance Manholes 92A and 92B are located on New England Way in Lincoln upstream and downstream of Tanury Industries, which conducts metal finishing operations. On February 18, 2016 and September 15, 2016 the concentrations of copper and nickel in Industrial Surveillance Manhole 92B were in excess of the NBC discharge limitations of 1.20 ppm and 1.62 ppm respectively. The firm was issued Notices of Violation which required a report detailing the cause of the high metals concentration to be submitted. The firm attributed the violation on February 18, 2016 to a soap holding tank discharge, and would make process changes to reduce the metal concentrations in their soap tanks. The firm attributed the violation on September 15, 2016 to an employee discharging a vacuum that contained spilled plating solution directly to their pH adjustment tank. The employees were retrained on proper procedures for disposal of spilled materials. Continued industrial manhole monitoring will be conducted by NBC personnel in 2017 to monitor the compliance status of this company.

Industrial Surveillance Manhole 126

Industrial Surveillance Manhole 126 is located on Scenic View Drive in Cumberland, downstream of HP Services, Inc., which conducts metal finishing operations. On September 15, 2016 the concentration of zinc in Industrial Surveillance Manhole 126 was in excess of the NBC discharge limitation of 2.61 ppm. The firm was issued a Notice of Violation which required a report detailing the cause of the high metals concentration to be submitted. The firm is a batch discharger and did not have a discharge near the date of the violation. The firm was unsure as to the cause of the violation. Continued industrial manhole monitoring will be conducted by NBC personnel in 2017 to monitor the compliance status of this area.

SURVEILLANCE MANHOLE MONITORING CONCLUSIONS

The NBC conducts surveillance manhole monitoring throughout the sewer districts on a routine basis. These manholes are located up and down stream of significant industrial users and zero discharge facilities as well as in residential areas. Pretreatment staff reviews the analytical data from all manhole monitoring events. Pretreatment and EMDA staff work together to find the source when the results indicate non-compliance with NBC discharge limitations. In 2016, Pretreatment staff investigated all incidents of non-compliant manhole results. Companies which discharge to the manhole were inspected and Notices of Violation letters were issued to companies found to be the source of the noncompliant wastewater. This aggressive manhole monitoring program will continue in 2017.

V. NBC IMPACT OF PRETREATMENT PROGRAM ON CONTROL OF TOXICS AND INCOMPATIBLE WASTE

NBC Impact on the Control of Toxics and Incompatible Wastes

The continuing goal of the NBC is to improve receiving water quality by meeting and exceeding compliance with RIPDES discharge standards thereby limiting the impact wastewater treatment facility effluent has on Narragansett Bay. To this end, influent and effluent metals and cyanide loading data are evaluated to provide a measure of the amount of industrial waste being discharged to the sewer system, as well as a means of quantifying the effectiveness of the NBC in controlling and reducing the discharge of toxic pollutants into the collection system. The NBC has analyzed and tracked the toxic pollutant loading trends at its treatment facilities since the creation of the agency.

The data and analyses presented in this chapter summarize the 2016 monitoring initiatives performed by EMDA, including monitoring of the treatment facilities, the collection system, industrial and commercial users, and the receiving waters of Narragansett Bay. The Pretreatment section works in conjunction with the EMDA, Laboratory, Operations, and Engineering sections to control toxics from entering and impacting the sewer system. EMDA conducts sampling of wastewater from all discharge sources into the NBC system, throughout the collection and treatment systems, and ultimately to its final fate as either sludge or as treated effluent discharged into Narragansett Bay.

NBC RIPDES Permit Requirements

On December 31, 2001, both NBC wastewater treatment facilities were issued updated RIPDES discharge permits. Of significant interest was the removal of several pollutants from the permits due to five years of data that had revealed discharge levels well below the detection limits or aquatic life water quality criteria as they are applied to the NBC receiving waters.

At Field's Point, the following parameters were removed from the permit:

- Cadmium
- Hexavalent chromium
- Lead
- Tetrachloroethylene
- 1,1,1-trichloroethane
- Trichloroethylene
- 1,2-dichloroethylene
- Methylene chloride
- Bis(2-ethylhexyl) phthalate

At Bucklin Point, pollutants were also removed from frequent monitoring due to historically low concentrations. The following parameters were removed from the Bucklin Point permit:

- Cadmium
- Tetrachloroethylene
- 1,1,1-trichloroethane
- Trichloroethylene
- Dichloromethane

Monitoring of these pollutants continues through routine sampling and semi-annual priority pollutant scans. Data from these scans indicate that concentrations are either well below saltwater water quality criteria or not detectable in plant effluent.

The removal of a parameter from a RIPDES permit, or a downgrade to "monitor only" status, can be directly attributed to effective efforts by Pretreatment, ESTA, Laboratory, Operations, and EMDA staff. The timely collection of samples by EMDA, low-level trace analysis by the Laboratory, effective regulation of industry by Pretreatment, technical assistance provided to industry by ESTA, and effective treatment performed by Operations are the key components of an efficient wastewater treatment organization.

The NBC appealed several conditions within RIPDES permits RI100072 and RI10100315, as issued on December 31, 2001 to the Bucklin Point and Field's Point treatment facilities, respectively. These appeals were resolved by Consent Agreement RIA-330 between the NBC and DEM, which was fully executed and took effect on January 1, 2004. As a result of this consent agreement, interim permit limits at Bucklin Point for copper, mercury, nickel, silver, and zinc were developed based on historical effluent concentrations rather than water quality criteria. Similarly, the consent decree specified interim permit limits for copper at Field's Point. At both plants, cyanide permit limits were agreed upon that recognize the EPA quantitation limit of this parameter. Additional changes in the consent agreement included the addition of a second daily fecal coliform bacteria grab sample at the final effluent to improve the testing of this important water quality indicator. Seasonal limits were also set at Bucklin Point for ammonia in the final effluent based on ammonia toxicity criteria. As a result of these updated interim limits, NBC facilities are better able to remain in compliance.

Permit requirements were further modified by the Rhode Island Department of Environmental Management (DEM) during 2005 to satisfy a Rhode Island Legislative mandate to reduce the amount of nitrogen discharged to Narragansett Bay. The updated permit requirements imposed new total nitrogen discharge limits and mandated monitoring for nitrate, nitrite, and total Kjeldahl nitrogen (TKN) three times per week. TKN analyses determine both ammonia nitrogen and organic nitrogen in samples. The organic nitrogen component is necessary to determine and monitor total nitrogen in the treatment plant effluent. Permit monitoring requirements for ammonia remained at twice weekly, but the NBC has sampled all nutrient parameters three times per week since August 1, 2005. In 2006, a consent agreement was reached with both NBC facilities setting interim limits for total nitrogen as the facilities constructed the necessary infrastructure to achieve 5.0 mg/L. The consent agreement required that the 5.0 mg/L limits be put into effect for the May through October season once construction was complete. These permit limits for total effluent nitrogen went into effect on May 1, 2014 at Field's Point. At Bucklin Point the permit limits went into effect on July 14, 2014.

Consent Agreement RIA-330 was modified on February 27, 2007, to address compliance with biochemical oxygen demand (BOD) and total suspended solids (TSS) percent removal from the wet weather facilities at Bucklin Point, outfall 003A. The consent

agreement includes an equation to be used to calculate percent removal based upon wet weather influent concentration, wet weather influent flow, wet weather effluent concentration, wet weather effluent flow, and monthly average percent removal from Bucklin Point.

Sample Collection at the Wastewater Treatment Facilities

All sample collection, preservation, and storage at the NBC treatment facilities are performed with strict adherence to EPA protocols. As detailed in the current NBC RIPDES permits, the Field's Point and Bucklin Point treatment facilities are required to sample the influent and effluent for toxic and conventional pollutants on a regular basis.

Toxic pollutant monitoring requirements include 24-hour composite sample collections for the analysis of copper, lead, mercury, nickel, silver, chromium, and zinc in the influent and effluent. Metals and cyanide measurements are required twice-weekly at both plants. During 2016, EMDA staff collected all permit-required 24-hour composite samples of the waste streams at the two treatment facilities.

Field’s Point influent samples are collected at the single interceptor that feeds the facility, after bar screening and prior to the grit removal tanks. At Bucklin Point, influent composite samples are collected from the Blackstone Valley (BVI) and East Providence (EPI) interceptors that bring wastewater to the plant. Previously, collections from BVI and EPI were made on a flow-paced schedule and analyzed independently, with the independent analytical results combined based on the flow percentages for the sample collection period after chemical analysis. EMDA conducted a study in 2005 to determine whether combining these separate collections prior to analysis would improve accuracy of the analytical results. A substantial number of metals samples collected from EPI are below the detection limits of the NBC Laboratory instrumentation. This is due to both low flow and the small number of industrial users in this portion of the Bucklin Point service district. The flow proportioned combination of the samples prior to analysis was investigated to determine whether the resultant sample would provide a more accurate influent concentration. Results from this study indicated that, for samples that were routinely below the method detection limits, the combination of the samples improved the accuracy of analytical results. For samples above the detection limits, there was no significant difference between the two methods. By providing more representative influent data, evaluation of plant performance at the Bucklin Point facility is more accurate, and the improved results can, in turn, be used to fine tune processes within the wastewater treatment facility.

Twice-weekly influent cyanide samples are collected from the two Bucklin Point interceptor locations and are composites of nine separate grab samples at each location. These samples are combined flow proportionally in the same way as the metals and conventional pollutant composite collections.

Final effluent sample collections at both facilities are downstream of all treatment processes. Composite effluent samples are analyzed by the Laboratory for conventional pollutants and metals including copper, lead, mercury, nickel, silver, and zinc, as well as nutrients. The nutrients analyzed include nitrite, nitrate, ammonia, TKN, and total phosphorus. Nitrate is determined by difference from a combined nitrite+nitrate measurement and a nitrite measurement. The Laboratory has two state-of-the-art nutrient auto-analyzers, one to process treatment plant samples and one to process saltwater samples. These instruments have improved analysis efficiency for nutrient measurements, and analytical results from this equipment continue to produce better precision and accuracy than previous analyses.

Other required sample collections for plant monitoring include daily fecal coliform bacteria, BOD, TSS, pH, and total residual chlorine (TRC). Effluent samples are collected and analyzed for dissolved metals and oil and grease at both facilities on a monthly basis. Whole effluent bioassay toxicity tests are also conducted quarterly at both facilities.

As previously noted, on August 1, 2005 nutrient monitoring was increased from two to three times per week. A consent agreement was signed on June 16, 2006 that imposed interim seasonal total nitrogen limits of 10 mg/L and 18.2 mg/L for Bucklin Point and Field's Point, respectively. As required by the consent agreement, the Biological Nutrient Removal (BNR) facility performance at Bucklin Point was closely observed through the end of the summer 2007 so that an engineering analysis could be performed. The engineering analysis determined that the facility could not achieve the seasonal total nitrogen limit of 5.0 mg/L and would require additional major facility upgrades and renovations to implement additional BNR technology. As of July 2014, construction upgrades were completed for both plants and they are now operating under a seasonal (May – October) nitrogen limit of 5.0 mg/L.

Clean Sampling Implementation

As of January 1, 2000, all treatment facility sampling is performed with methods outlined in *US-EPA Method 1669 – Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels*. As laboratory detection limits continue to be lowered, EMDA is constantly evaluating its sample collection and handling procedures to ensure that contamination will not significantly affect the data results. EMDA adopted and is adhering to ultra-clean sampling methodology developed by Hampton Roads Sanitation District of Virginia via participation in a National Association of Clean Water Agencies (NACWA) mercury study. This methodology uses sample bottles, tubing, and pumps that allow sample collection and transfer without opening bottle tops, eliminating many potential sources of contamination. The experience gained in this study assisted EMDA in determining the best ways to improve the performance-based clean sampling methods.

EMDA has implemented a plant sampling quality assurance program to evaluate the success of its current clean sampling program in limiting contamination in nutrient and metals composite sampling of the influent and effluent at the two treatment facilities. The program defines a strict protocol for cleaning the 10 and 15 liter HDPE composite carboys used in the sampling. In short, this procedure involves dishwasher cleaning with laboratory-grade soap, followed by acid-cleaning with nitric acid. Carboys are then acid-cleaned using hydrochloric acid and rinsed with distilled, de-ionized (DI) water that has been treated with a Barnstead Nano Pure four cartridge filtration system to a purity minimum of 15 mega ohms per centimeter resistivity. Another key element of the plant sampling quality assurance program is the regular cleaning of the suction pump tubing used in drawing the wastestream sample into the composite carboy container. This cleaning follows the same steps as the carboy cleaning. The success of the carboy and tubing cleaning is evaluated with the collection of blank samples. For these blank samples, DI water is added to cleaned carboys and held for a minimum of 12 hours to simulate normal sample holding times. This water is then analyzed for the same parameters as the wastewater sample. Tube cleaning is evaluated by drawing DI water through the tubing into pre-cleaned containers. Results from these samples have helped EMDA, in conjunction with the Laboratory, determine the steps needed to continue to improve the clean sampling protocols as analytical detection limits continue to be reduced through improved laboratory procedures and instrumentation.

Field's Point Special Sampling Activities

The following summarizes the special sampling activities conducted at Field's Point during 2016:

- EMDA staff continued to check the agreement between the continuous, in-situ influent and effluent pH probes with discrete pH grab samples analyzed by the Laboratory. A report showing the results from the two systems was generated and sent to both Laboratory and the Operations staff responsible for maintaining the plant equipment. Working with the Laboratory on this calibration effort helped to improve data quality and comparability. Prior to the automated system, the results of this comparison were documented in a daily log sheet.

- EMDA staff performed daily checks of the influent and effluent wastestream channels for the presence of total residual chlorine and sulfides which may interfere with cyanide sample analyses. EMDA staff used standard potassium iodide, starch, and lead acetate indicator papers for this testing. In 2016, all tests for these constituents yielded non-detectable results. If either of these constituents was detected, the cyanide sampling, if in progress, would have been suspended and re-started the following day to ensure that these chemicals did not interfere with the cyanide analysis.

- In an effort to learn more about the concentrations of bacteria in the treated effluent, the NBC instituted monitoring of the effluent for enterococcus bacteria. The monitoring began in May 2010 and continued throughout 2016. The data has not shown a strong correlation between fecal coliform concentrations and enterococcus concentrations. Disinfection of enterococcus bacteria appears to be highly dependent on contact time. Work will continue on this project in anticipation of RIPDES permit changes requiring compliance with a limit for enterococcus.

- EMDA staff assisted ESTA and URI staff with collecting samples for a study of greenhouse gas emissions from the treatment plant. Samples were collected from various unit operations and analyzed by the NBC Laboratory for various nutrient parameters. URI scientists were monitoring the emissions for greenhouse gases. Monitoring was performed approximately monthly during 2016.

- In anticipation of future limitations on arsenic discharges at Field's Point, monthly monitoring was conducted of the arsenic species discharged from industrial users, the plant influent and effluent as well as the effluent from Bucklin Point.

Bucklin Point Special Sampling Activities

The following activities summarize special sampling activities conducted at Bucklin Point during 2016:

- EMDA staff picked up septage samples weekly at the Lincoln Septage Receiving Station and delivered them to the Laboratory for analysis. Three daily composite samples of septage loads discharged at the station were analyzed for trace metals and cyanide each week. Interceptor Maintenance staff sampled and screened each septage truck delivery for quality by measuring pH during the pump-out at the septage facility.

- EMDA staff performed daily laboratory analyses of both permit and process samples collected daily for effluent pH and temperature. EMDA staff also performed regular daily pH checks of the influent. The influent grab sample was collected at the Grit and Screening Building, in the channel prior to the bar screens. Results were communicated to the Laboratory and Operations staff for permit compliance and process control applications. Abnormal pH measurements would have triggered additional grab samples being collected and an investigation by Pretreatment. The QA/QC program requires calibration, checks, and documentation that the pH meter and colorimeter used for these tests are operating properly.

- EMDA staff performed daily checks of the influent and effluent wastestream channels for the presence of total residual chlorine and sulfides which may interfere with cyanide sample analyses. EMDA staff used standard potassium iodide, starch, and lead acetate indicator papers for this testing. In 2016, all tests for these constituents were non-detected at Bucklin Point. If either of these constituents was detected, the cyanide sampling, if in progress, would be suspended and re-started the following day to ensure that these chemicals did not interfere with the cyanide analysis.

- In an effort to learn more about the concentrations of bacteria in the treated effluent, the NBC instituted monitoring of the effluent for enterococcus bacteria. This evaluation began in June 2010 and continued throughout 2016. The data has not shown a strong correlation between fecal coliform concentrations and enterococcus concentrations. Work will continue on this project in anticipation of RIPDES permit changes requiring compliance with a limit for enterococcus.

- In early 2016 it was observed that the mixed liquor TSS data did not match very well with observations and with continuous on-line probe. The composite sample tended to measure higher than the actual TSS concentration. A series of experiments were conducted in order to determine cause so that improvements could be made. These experiments indicated that the first portion of each grab sample made by the automatic sampler tended to be higher in solids than the rest of the sample. Several adjustments were made to the positioning of the sample line as well as the program used by the automatic sampler to ensure the sample was representative. During 2016 a daily mixed liquor grab sample was added as a second check to the mixed liquor composite. To ensure that the best mixed liquor data is used each day the mixed liquor composite TSS result is compared to the average reading of the on-line TSS meter and the grab sample TSS concentration is compared to the meter reading at the time the grab sample is collected.

Analysis of Influent Loading Data

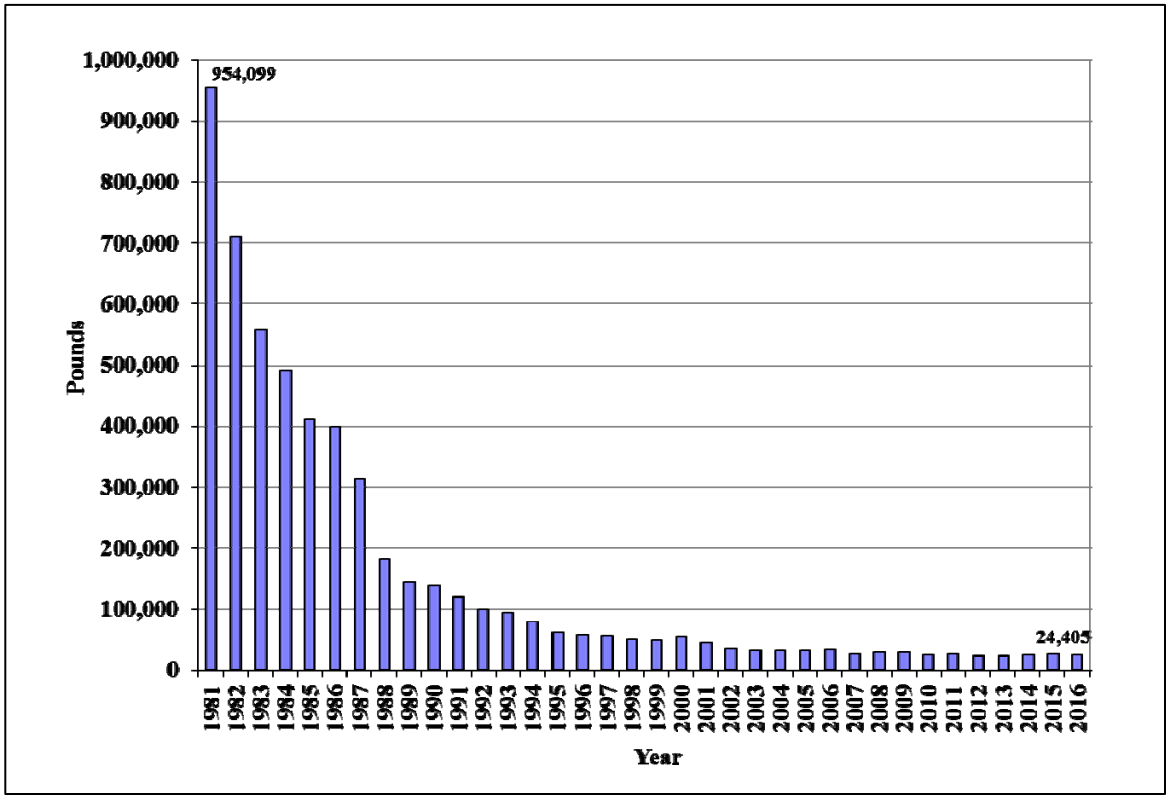
Comparing recent and historical influent loading data is useful for evaluating the success of the Pretreatment Program in controlling the quality of industrial wastewater discharged to the collection system. Analysis of historical toxic pollutant loadings to the two NBC wastewater treatment facilities has indicated a downward trend.

Records of data for metals and cyanide in the Field's Point collection system have been collected and analyzed since 1981. Significantly less historical loading data are available for Bucklin Point, which was acquired by the NBC in 1992. The historical Bucklin Point data presented in this chapter cover the period from 1994 to present for metals, and 1991 to present for cyanide.

Field's Point District - Influent Loading Analysis

FIGURES 14 and 15 depict the reduction in metals and cyanide loadings to Field's Point between 1981, the year before the NBC assumed the ownership and operation of the Field's Point treatment facility and portions of the metropolitan Providence sewer system, and the present.

FIGURE 14
Field's Point Total Metals Influent Loading Trend Analysis



Over the past 34 years, there has been a significant downward trend in the total loadings of metals as can be seen in FIGURE 14. Total metals loading is defined as the sum of cadmium, copper, chromium, lead, mercury, nickel, silver, and zinc loadings. These loadings showed a decrease of 97.4% since 1981. In fact the total metals loadings to Field's Point have been below the Maximum Allowable Headworks Loadings (MAHL) of 140,233 pounds since the early 1990s. Since 2002 the total metals loading has been consistent with minor fluctuations during this time period. Influent metals loadings in 2016 decreased by 1,958.4 pounds, or 7.4%, from 2015.

Cyanide loading data for the same time period indicates a similar overall downward trend, as can be seen in FIGURE 15, with a dramatic 98.6% decrease in loadings between 1981 and 2016. Between 2015 and 2016 there was a 5.2 pound, or 0.5% increase, in cyanide

influent loading into Field's Point. This 2016 influent loading of cyanide was the third lowest influent cyanide loading measured since 1981, when monitoring began. The achievement in reducing the metal and cyanide inputs to the treatment facilities is largely due to the efforts and success of the Pretreatment and ESTA programs.

FIGURE 15
Field's Point Cyanide Influent Loading Trend Analysis

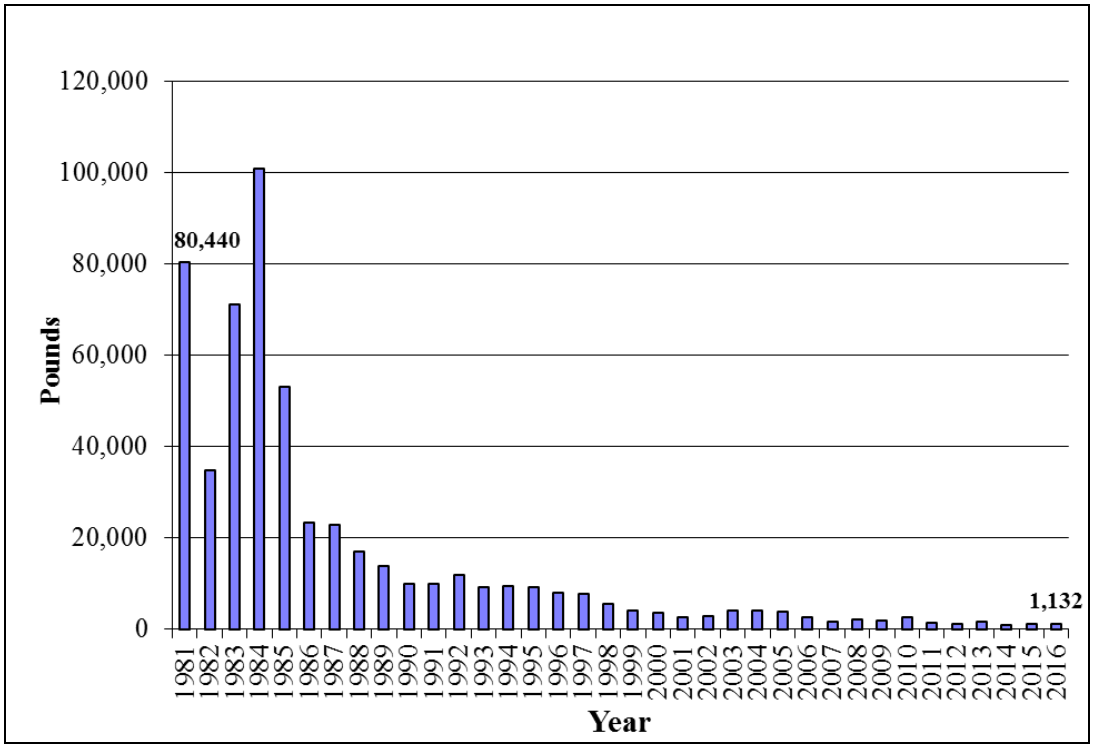


TABLE 19 provides a comparison of the 2015 and 2016 metals and cyanide loadings to Field's Point. Loading figures were calculated based on monthly averages of concentration and flow. As illustrated in TABLE 19, the annual influent loading for all metals showed a decrease of 7.4%, or 1,958.4 pounds in 2016 when compared to 2015. However, there were two metals that increased in 2016 as compared to 2015. The other six metals used to calculate influent loading all decreased in 2016. The largest percent decrease was seen in zinc which decreased by 10.8%, followed by lead with a 9.7% decrease. Mercury and nickel were the only two metals to exhibit a percent increase with increases of 1.2% and 8.3% respectively. Cyanide also had a small decrease of 0.5% or 5.2 pounds from 2015 to 2016. Overall, loading of metals remains low due to strict regulation by Pretreatment and the NBC educational efforts and the proactive approach to pollution prevention. The decreases since the NBC has taken over the operation of Field's Point demonstrate the continued commitment to vigilant enforcement and continued encouragement to users to implement pollution prevention measures**.** Influent flow into Field's Point was on average about 0.5 MG a day lower in 2016 than it was in 2015 with an average daily influent flow of 38.1 MGD in 2016 versus 38.6 MGD in 2015. There was also an increase of 42,309 gallons per day in industrial flow to Field's Point in 2016.

TABLE 19
Comparison of 2015 - 2016 Annual Loadings to Field's Point

Pollutant	2015 (Pounds)	2016 (Pounds)	Total Pound change	% Change
Total Cadmium	310.2	290.9	-19.3	-6.2%
Total Chromium	1,290.2	1,251.8	-38.4	-3.0%
Total Copper	5,458.2	5,047.7	-410.5	-7.5%
Total Lead	1,492.8	1,348.2	-144.6	-9.7%
Total Mercury	4.96	5.02	0.06	1.2%
Total Nickel	2,728.5	2,955.8	227.3	8.3%
Total Silver	470.0	469.2	-0.8	-0.2%
Total Zinc	14,608.7	13,036.7	-1,572.0	-10.8%
Total Metals	26,363.7	24,405.3	-1,958.4	-7.4%
Total Cyanide	1127.1	1,132.3	5.2	0.5%

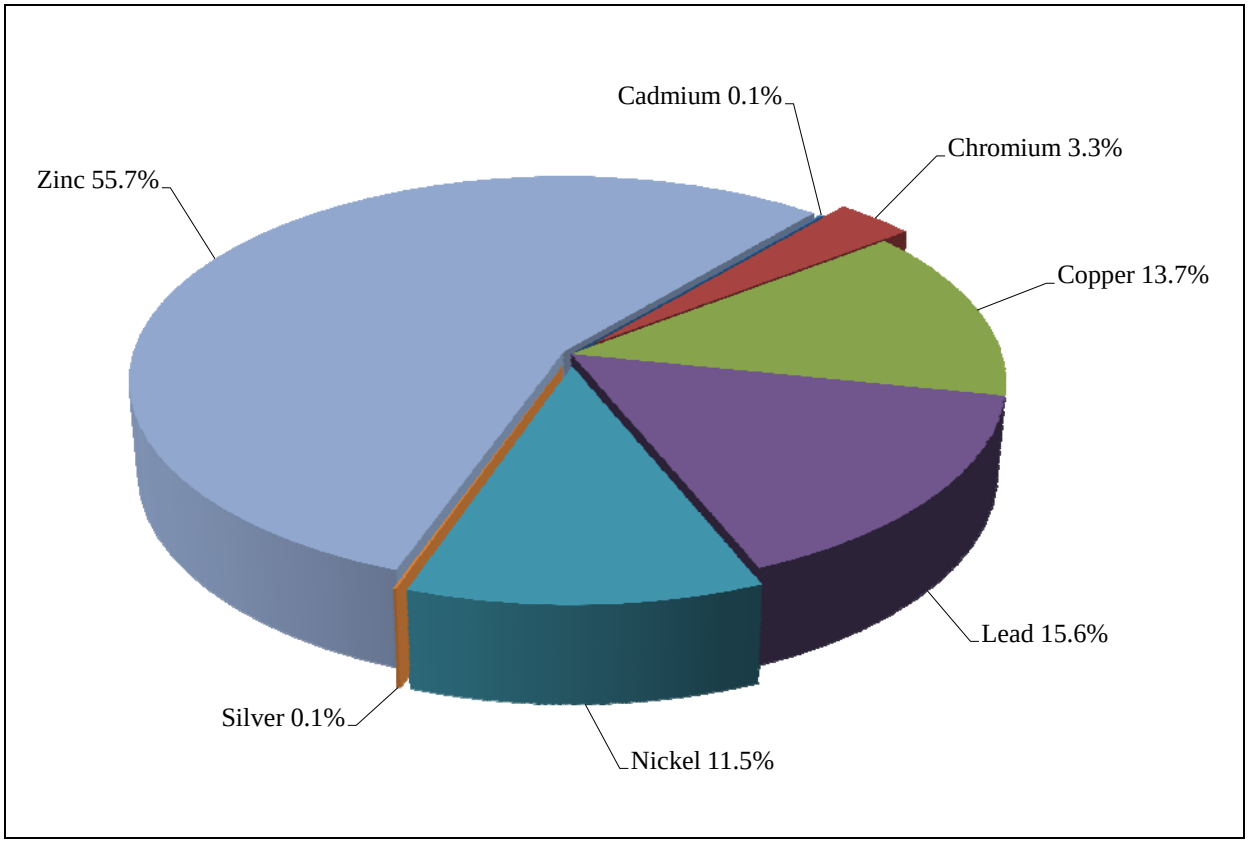
In 2016, the Field's Point facility provided secondary treatment to an additional 1.03 billion gallons of flow that was captured in the CSO Tunnel, approximately 80.0 million gallons more than in 2015. Past sampling has shown that the metals loading received into Field's Point from the tunnel is not a significant portion of the total metals loading to the plant. Sampling of the tunnel effluent in 2016 has shown that the metals in the tunnel effluent make up approximately 3.2% of the total plant influent metals loading for metals, ranging from 0.17% to 9.05% of the total plant influent metals loading depending upon the metal. As can be seen in TABLE 20, for the majority of metals, tunnel effluent does not make up a considerable portion of the influent loading, less than 3.4%. However, for lead, tunnel effluent is estimated to be 9.05% of the Field's Point influent loading.

TABLE 20
Comparison of 2016 Annual Loadings to 2016 Tunnel Effluent Loadings to Field's Point

Pollutant	Annual Influent Loading (lbs) 2016	Annual Tunnel Effluent Loading (lbs) 2016	Percent of Influent
Cadmium	290.9	0.95	0.33%
Chromium	1,251.8	26.1	2.08%
Copper	5,047.7	107.3	2.13%
Lead	1,348.2	122.0	9.05%
Nickel	2,955.8	90.5	3.06%
Silver	469.2	0.79	0.17%
Zinc	13,036.7	436.9	3.35%
Total	24,405.1	784.5	3.21%

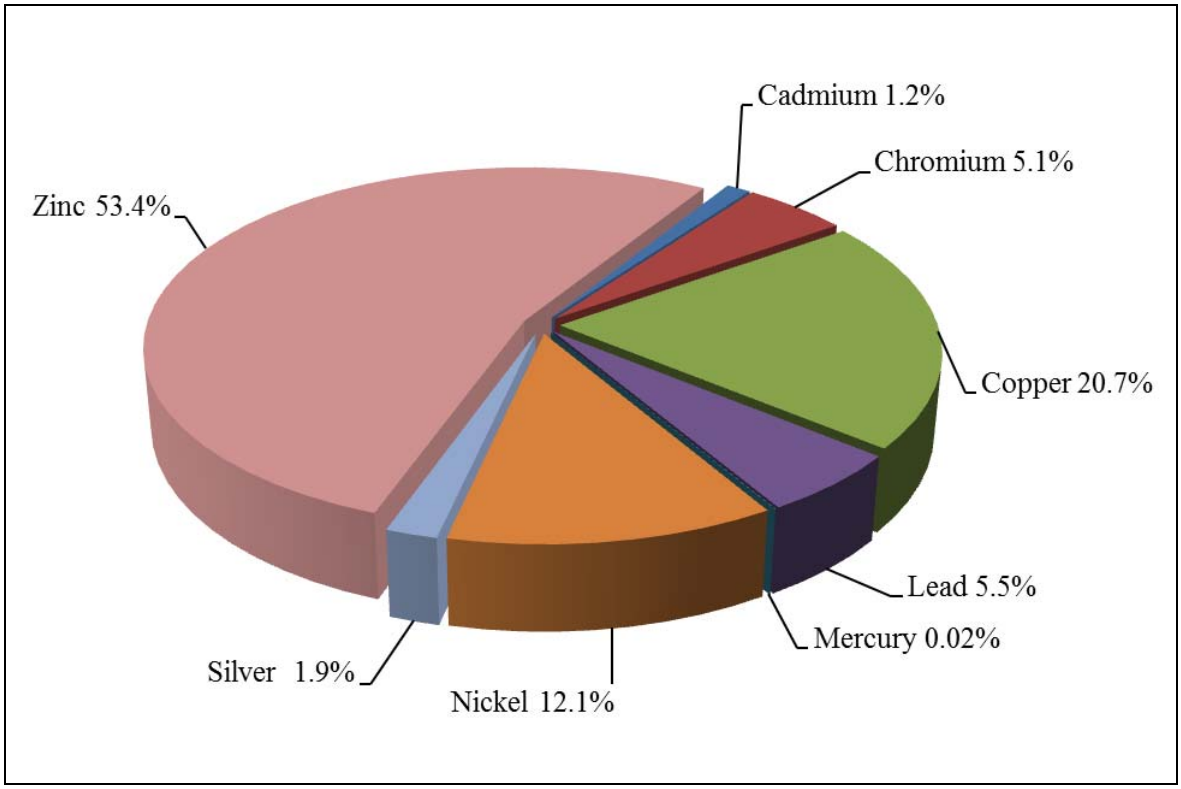
A percentage breakdown of the various metals discharged to Field's Point via the CSO tunnel is provided in FIGURE 16. As shown in FIGURE 16, the make-up of the CSO Tunnel effluent is similar to the typical influent with the notable exceptions of increased lead contribution and a decreased copper contribution. Lead often makes-up a greater portion of metal pollutants found in stormwater and with the tunnel receiving large amounts of stormwater from the service district, lead input from the tunnel could be expected to be high.

FIGURE 16
Breakdown of Total Metals – CSO 2016 Tunnel Effluent Loading



A percentage breakdown of the various metals discharged to Field's Point is provided in FIGURE 17. The majority of metal loadings to Field's Point are from zinc, copper, and nickel. These metals account for 86.2% of the total metal loadings to Field's Point, roughly equivalent to the relative contribution observed during 2015. The loading of total zinc in 2016 was 13,036.7 pounds, or 53.4%, the highest of any toxic pollutant impacting the Field's Point facility. As will be shown later in this chapter, the majority of zinc loadings are attributed to residential sources. Copper was the next highest pollutant load to Field's Point at 5,047.7 pounds or 20.7%, followed by nickel at 2,955.8 pounds or 12.1%. The loadings levels of toxic pollutants to Field's Point in 2016 were all well within the Maximum Allowable Headworks Loading (MAHL) levels for each pollutant of concern. This is a testament to the success of the NBC toxic reduction and control programs.

FIGURE 17
Breakdown of Total Metals – Field's Point 2016 Influent Loading



Oil and Grease Inputs to Field's Point

Monthly sampling of oil and grease inputs to Field's Point revealed low and consistent concentrations. Influent concentrations ranged from 10.2 ppm to 31.2 ppm during 2016. Effluent concentrations were significantly lower than influent with results of <4.0 ppm or not detectable, for all samples. Low inputs are the direct result of Pretreatment efforts to permit, inspect, and monitor industrial and commercial establishments, including food service establishments, with the potential to impact the NBC with fats, oils, and grease. The NBC RIPDES permit requires monthly sampling, with three grab samples collected over the course of a 24-hour period, one grab per shift. The grab samples are analyzed separately and the maximum is reported. The RIPDES permit does not set a discharge limit for oil and grease. The 2016 oil and grease data is listed in ATTACHMENT VOLUME II SECTION 10.

Field's Point Influent and Effluent Organics

Volatile organic compounds (VOC) were monitored monthly in the influent and effluent at the Field's Point facility in 2016. These samples were collected as composite and grab samples. The analysis of 33 organic compounds using EPA method 624 is routinely performed to ensure that the amount of organics introduced to the facility is being adequately regulated by the Pretreatment Section. High levels of organics can be

dangerous to the health and safety of NBC employees and can potentially pose a significant hazard to the microbial population that is responsible for the removal of organic carbon in the influent wastewater. Of the 396 analytical results for influent and effluent samples obtained during 2016, 90.9% of all influent samples had non-detectable concentration levels of volatile organic compounds and 92.4% of the effluent VOC samples had non-detectable VOC concentration levels. The low levels of VOCs observed demonstrates the effectiveness of Pretreatment efforts to reduce the amount of organic pollutants introduced to the NBC facilities, thereby dramatically reducing the potential for adverse impacts on NBC receiving waters.

Field's Point Influent and Effluent Nitrogen

In May 2014, a new seasonal May through October permit limit for effluent total nitrogen went into effect for the Field's Point plant with monthly average limits of 5.0 mg/l for total nitrogen concentration and 2,711 pounds loading per day. Construction of biological nutrient removal (BNR) processes to meet these permit limits was completed in 2013. BNR processes ran extremely well in 2016 and monthly average permit limits were met in each month of the season under this permit limit. The May through October total effluent nitrogen concentration average was 3.5 mg/l with an average loading of 1,026 pounds/day. Field's Point had an average daily flow to the facility of 34.8 MGD in the May through October season, with an influent total nitrogen concentration average of 30.0 mg/l for May through October, resulting in an 88.5% removal rate of total nitrogen.

pH Variability at Field's Point: Influent and Effluent

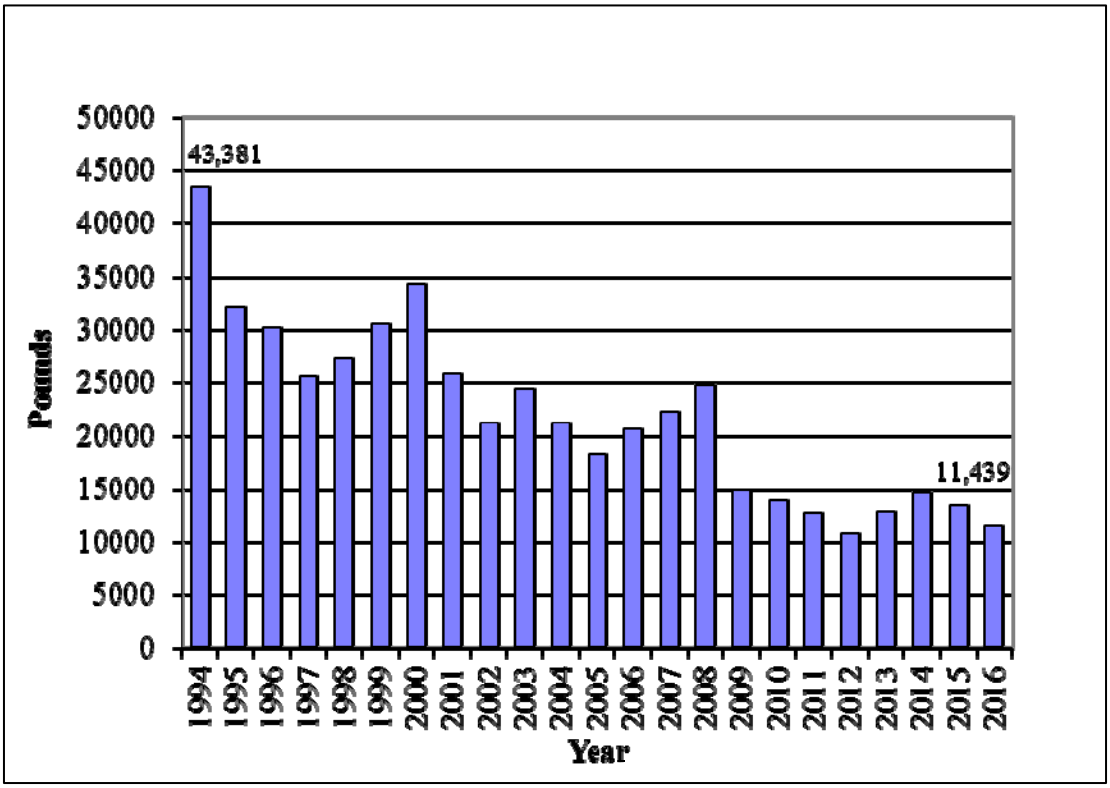
The pH of the Field's Point influent is measured once per day by Laboratory staff on a high-precision Orion pH meter. Grab samples are collected by EMDA and immediately transferred to the lab for analysis. EMDA collected 366 influent pH samples during 2016. The pH range of the influent sample measurements was between 6.57 and 7.47 standard units (s.u.). The influent wastestream is also monitored with a continuous pH probe. This record shows a clear diurnal pattern with differences of approximately 1 s.u. No NBC wastewater treatment facility process was knowingly negatively impacted by influent pH fluctuations during the year. There were also no persistent excursions in influent pH during 2016 and no negative effect on normal plant operation process controls was noted. Effluent grab samples were collected twice daily, resulting in 732 samples collected in 2016. Over the year, the effluent pH ranged from 6.20 to 7.34 s.u. There were no effluent pH permit violations during 2016.

Bucklin Point District - Influent Loading Analysis

The Bucklin Point influent data demonstrated a downward trend in total metals loading between 1994 and 1997, followed by an upward trend between 1997 and 2000 as can be seen in FIGURE 18. Data from 2001 and 2002 showed reductions in influent metals loadings, while data from 2003 showed another increase, the majority coming from short-lived high chromium inputs that occurred from January 28, 2003 through June 3, 2003. The 2006 through 2008 data indicated another increase in metals loading to

Bucklin Point. Once again this increase was primarily due to an increase in chromium loading. Influent metals loadings since 2009 have remained lower, ranging between 10,000 and 15,000 pounds per year. In 2016, influent metals loading decreased by 14.6% to 11,438.8 pounds as compared to 13,401.3 pounds in 2015. The 2016 total metals loading to Bucklin Point was well below the MAHL of 35,928 pounds and has been since 1995.

FIGURE 18
Bucklin Point Total Metals Influent Loading Trend



Cyanide loadings at Bucklin Point have also exhibited a dramatic historical decrease as can be seen in FIGURE 19. Since 1991, cyanide loading has decreased by 90.3%. In 2016, influent cyanide loading decreased by 19.5% to 282.5 pounds as compared to 351.0 pounds in 2015. Loadings have been well below the MAHL level established to protect the treatment facility and the environment.

FIGURE 19
Bucklin Point Cyanide Influent Loading Trend

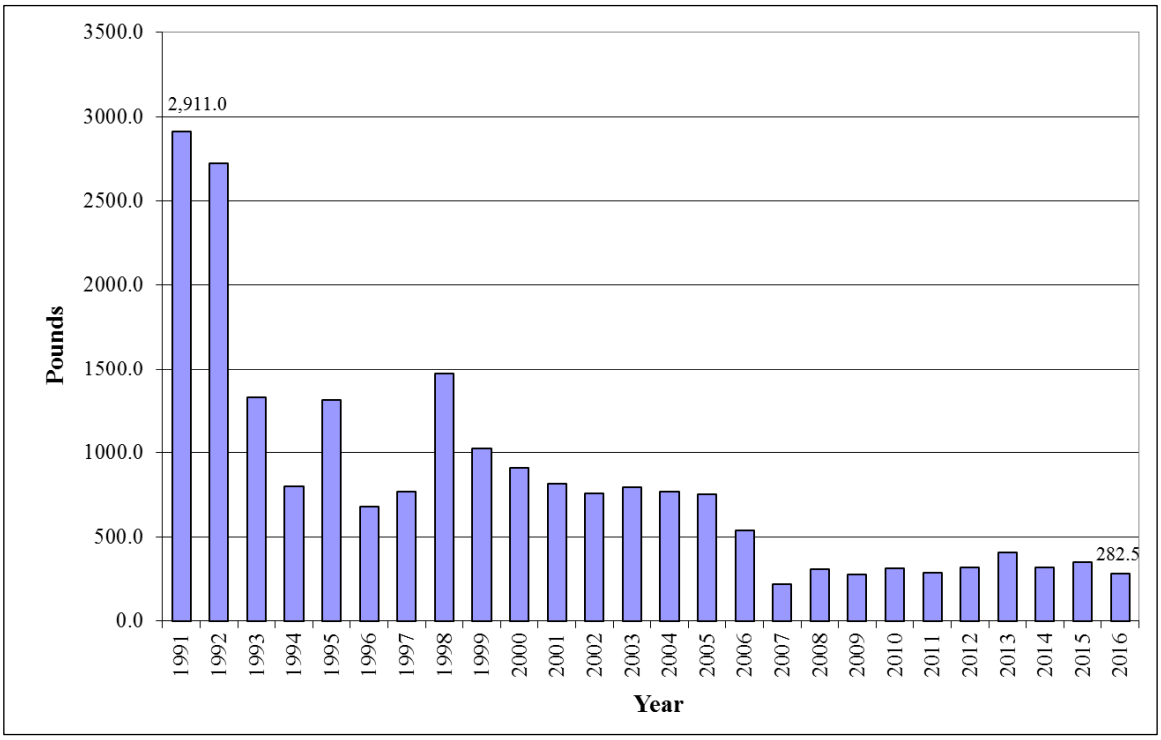


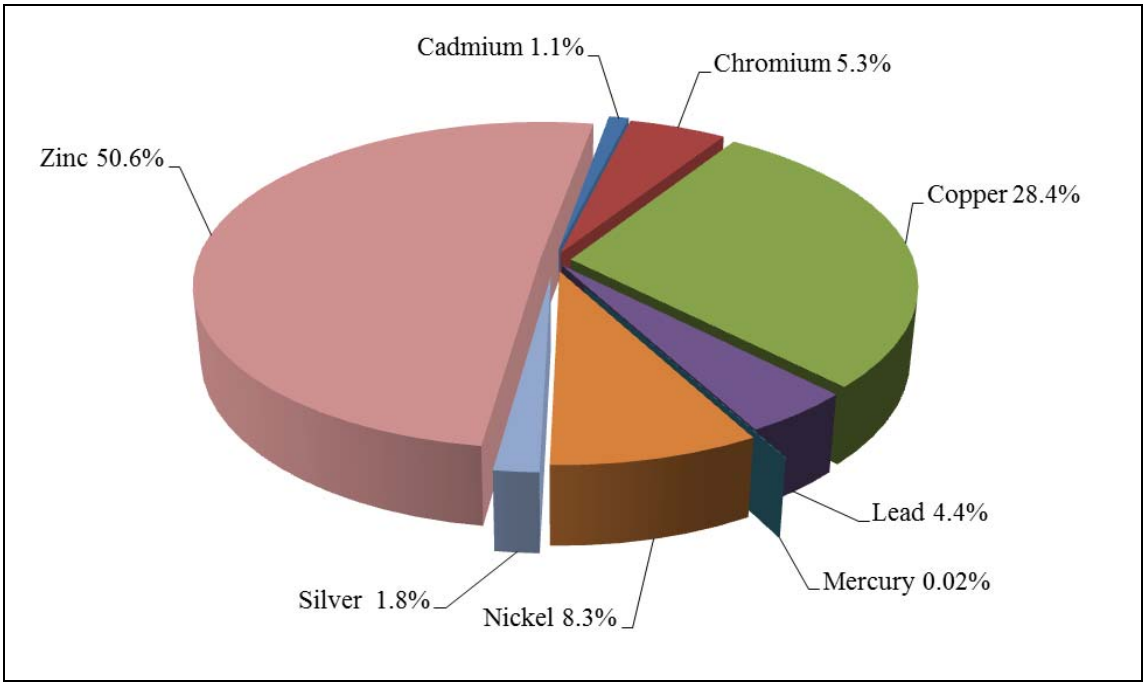
TABLE 21 shows the comparison of Bucklin Point metals and cyanide loadings for 2015 and 2016. In 2016, all influent metals showed a decrease in loading as compared to 2015. The largest percent decrease was seen in copper, which decreased by 844.6 pounds, or 20.6%. The largest decrease in pounds was seen in zinc, which decreased by 973.0 pounds, or 14.4% of the 2015 load. The metal with the lowest percent decrease was nickel, which decreased by only 3.3% or 32.7 pounds. Overall, total metals loading to the Bucklin Point facility has decreased 73.6% between 1994 and 2016.

TABLE 21
Comparison of 2015 - 2016 Annual Loadings to Bucklin Point

Pollutant	2015 Pounds	2016 Pounds	Total Pound Change	% Change
Total Cadmium	135.2	124.0	-11.2	-8.3%
Total Chromium	644.9	607.5	-37.4	-5.8%
Total Copper	4,096.6	3,252.0	-844.6	-20.6%
Total Lead	560.7	508.7	-52.0	-9.3%
Total Mercury	2.6	2.4	-0.2	-7.7%
Total Nickel	987.3	954.6	-32.7	-3.3%
Total Silver	217.2	205.8	-11.4	-5.2%
Total Zinc	6,756.8	5,783.8	-973.0	-14.4%
Total Metals	13,401.3	11,438.8	-1,962.5	-14.6%
Total Cyanide	351.0	282.5	-68.5	-19.5%

FIGURE 20 provides a breakdown of the relative contribution of various metals discharged to Bucklin Point. As in previous years, zinc and copper were the largest contributors to total metals loading to Bucklin Point, accounting for 79.0% of the total. However, both of these metals did decrease substantially compared to the previous year. Total zinc decreased by 973.0 pounds in 2016 and made up 50.6% of the total metals loading to the facility. Copper decreased by 844.6 pounds and made up 28.4% of the total metals loading to the facility. Other metals with substantial loadings included chromium, nickel, and lead, accounting for another 18.1% of the total percentage of metals loading.

FIGURE 20
Breakdown of Total Metals – Bucklin Point 2016 Influent Loadings



Oil and Grease Inputs to Bucklin Point

Monthly sampling of oil and grease inputs to Bucklin Point revealed mostly low and consistent concentrations. During 2016, average influent concentrations ranged from 16.70 ppm to 39.10 ppm. Effluent concentrations were significantly lower than influent concentrations, with results of <4.0 ppm, or not detectable, for all samples. Low inputs are the direct result of Pretreatment efforts to permit, inspect, and monitor industrial and commercial establishments, including food service establishments, with the potential to impact NBC operations with fats, oils, and grease. The NBC RIPDES permit requires monthly effluent sampling of oil and grease, with three grab samples collected over the course of a 24-hour period, one grab per shift. The grab samples are analyzed separately and the maximum is reported. The RIPDES permit does not set a discharge limit for oil and grease. The 2016 oil and grease data are listed in ATTACHMENT VOLUME II SECTION 10.

Bucklin Point Influent and Effluent Organics

Volatile organic compounds (VOC) were monitored monthly in both the influent and effluent at the Bucklin Point facility in 2016. The analysis of 33 organic compounds using EPA method 624 is routinely performed to ensure that the amount of organics introduced to the facility is being adequately regulated by the Pretreatment section. High levels of organics can be dangerous to the health and safety of NBC employees, and can potentially pose a significant hazard to the microbial population that is responsible for the removal of organic carbon in the influent wastewater. Of the 396 analytical results for influent samples obtained during 2016, 94% of these were at non-detectable concentration levels. Of the 396 analytical results for effluent samples obtained in 2016, 99% of the results were at non-detectable concentration levels. The low concentrations of VOCs observed in both the influent and effluent demonstrates the effectiveness of Pretreatment efforts to reduce the amounts of organic pollutants introduced to the Bucklin Point facility, which are also therefore prevented from entering the receiving waters of the Bay.

Bucklin Point Influent and Effluent Nitrogen

In July 2014, biological nutrient removal upgrades were completed at Bucklin Point in order to meet a new seasonal, May through October, total nitrogen concentration permit limit of 5.0 mg/L and loading limit of 1,293 pounds/day. These new permit limits went into effect at Bucklin Point on July 14, 2014.

Over the 2016 permit season, daily flow to the facility averaged 14.44 MGD and influent nitrogen concentration averaged 34.46 mg/L. Generally, the BNR processes ran smoothly, and effluent total nitrogen concentrations averaged 3.18 mg/L. Total nitrogen loading throughout the season averaged 387.9 pounds/day.

The only substantial disruption to the BNR process during 2016 occurred in June, where the monthly average total nitrogen concentration of 5.31 mg/L exceeded the permit limit. The problems with BNR during this month were attributed to an instrument installed in early June in order to reduce struvite build-up in the system. The instrument was deactivated and removed in late June, at which point effluent quality improved and was within permitted limits.

Despite this interruption, the 2016 May – October season was highly successful, with an overall seasonal removal rate of 90.8% of the total nitrogen entering the plant in the influent.

Septage Loading to Bucklin Point

The NBC accepts residential-quality septage in the Bucklin Point district. Septage haulers discharge their loads at the Lincoln Septage Receiving Station, where solids are removed prior to the wastestream entering the collection system for final transport to the Bucklin Point plant for processing. A sample from each load is collected after the sample port is flushed thoroughly, usually after the load has discharged for approximately one minute. The sample from an individual truck is screened for pH, odor, and other unusual characteristics. If any anomaly is observed, the load may be rejected or the sample may be targeted for individual analysis. Otherwise each grab sample is combined with the delivery for the day and sent to the laboratory for analysis. This sampling protocol has helped to more quickly locate potential non-residential inputs to the collection system from septage haulers. Grit removal at the septage facility removes a portion of the metals loading prior to its introduction to the sewer system and the treatment plant.

FIGURE 21 details the change in septage flow and metals loadings from septage between 1996 and 2016. The NBC received 7.84 million gallons of septage in 2016, representing decreases of 6.9% compared to 2015 and 46.9% compared to 1996. The graph shows septage flow peaked in 2000 at approximately 23 million gallons. As the economy took a downturn, septic tank pump out frequency has declined, allowing solids, and the metals contained in the solids, to increase proportionally. From 2015 to 2016 there was a 29.6% decrease in total metals loading from septage, or 463 pounds. The overall reduction in total metals from septage since 1996 is 59%. Despite the small overall flow of septage to Bucklin Point, the metals loading from septage is substantial. The septage contribution to total influent metals at Bucklin Point was 9.6% in 2016, slightly lower than the contribution of 11.7% in 2015.

FIGURE 21
Trend Analysis of Total Metals Loadings in Septage

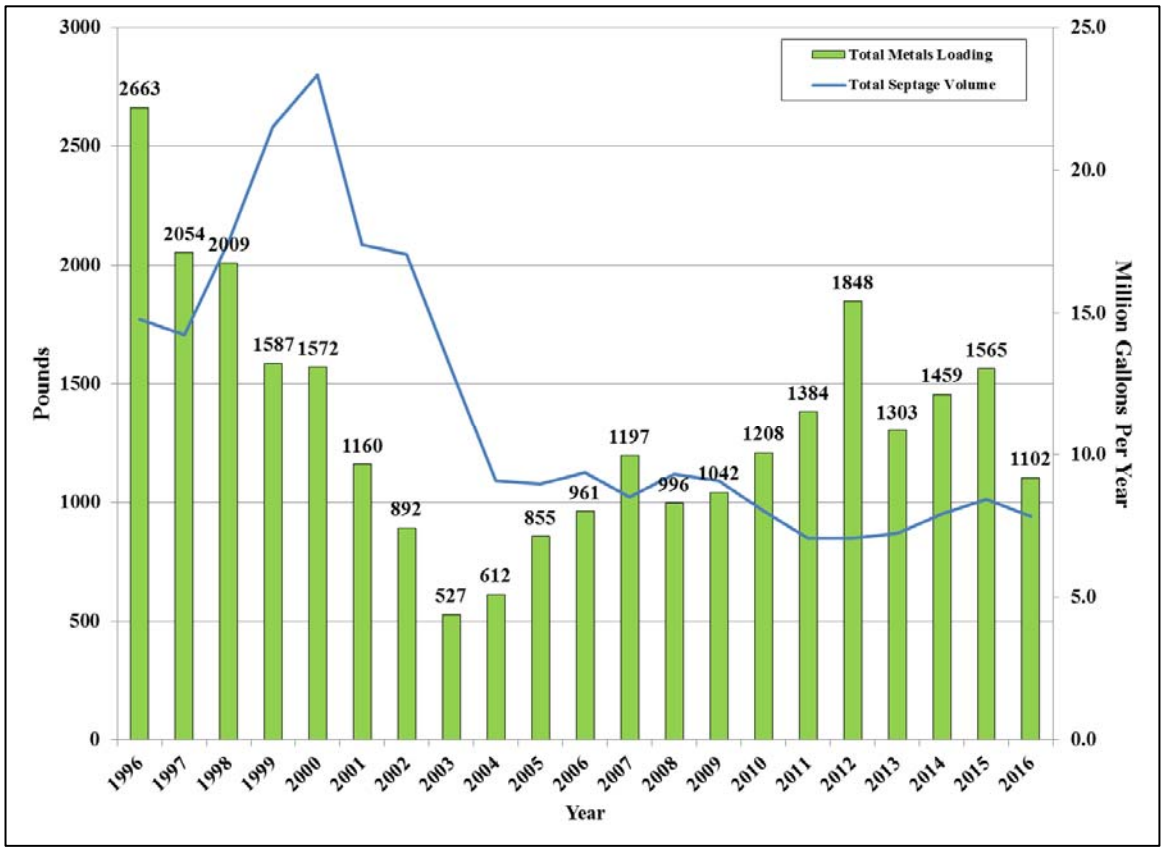
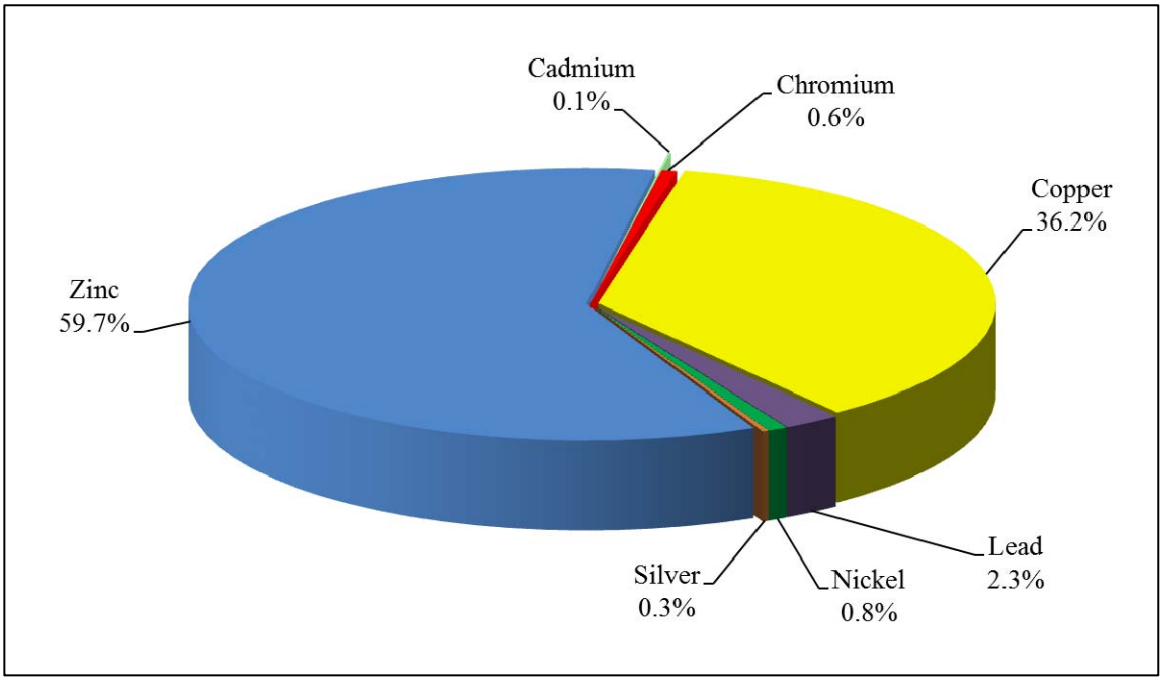


FIGURE 22 illustrates the average relative composition of metals in the septage received at the NBC facility in 2016. As in previous years, zinc and copper continue to make up the majority of metals loadings (95.9%) within the septage, at 400 pounds of copper and 658 pounds of zinc in 2016. Zinc loading from septage represented 11.4% of the total influent zinc loading to Bucklin Point during 2016; copper from septage amounted to 12.3% of the total copper influent load. The substantial loadings of these metals from this residential-quality septage underscores the significance of uncontrolled sources of influent metals loadings to NBC facilities. The septage monitoring data generated during 2016 are provided in ATTACHMENT VOLUME II, SECTION 10.

FIGURE 22
2016 Breakdown of Total Metals in Septage



Background Sources of Metals to the Influent Load

Sewer Collections for Determining Non-Industrial Background Contributions to Influent Metals Loading

The NBC has studied background (i.e., non-industrial) sources contributing to the total metal influent loadings to the Bucklin Point and Field's Point facilities since 1993. Samples are collected from sanitary and combined sewers in residential neighborhoods, and results over the years have shown substantial levels of trace metals and other toxic pollutants coming from these uncontrolled sources. In May 2000, EMDA began sample collections using EPA-approved guidance on clean sampling techniques, further improving their ability to quantify background metals inputs to the NBC facilities.

During 2016, EMDA staff collected 46 samples in residential sanitary and combined sewers. Samples were collected as 24-hour composites in wet and dry weather conditions. TABLE 22 summarizes the results for the background sample collections for 2016 and compares them to influent concentrations and loading estimates at the NBC facilities. Permitted industrial and commercial sources account for only 6.5% of total flow into Bucklin Point and 4.1% of the total flow at Field's Point. This direct comparison of concentrations and loading estimates gives some approximation of the contributions of these pollutants from

background sources. Detection limit values were entered for samples with concentrations at or below the laboratory detection limits. Average influent concentration values were determined, while geometric means were calculated for the background data in order to reduce the impact of highly variable data on the comparison. Results of samples taken from both collection districts were used to determine the background concentrations; loadings were calculated using the average background concentrations and average daily non-industrial flow rates to each facility.

TABLE 22
Results from 2016 Background Metals and Cyanide Contribution Study

Concentration (ppb)													
	Cd	Cr	Cu	Pb	Hg	Ni	Ag	Zn	CN	As	Se	Sn	Mo
Background	0.19	1.27	25.46	5.49	0.02	2.29	0.21	113.92	4.64	0.65	1.18	5.10	0.99
FP Influent	2.50	10.81	44.18	11.59	0.04	26.01	4.03	113.28	9.72	1.75	2.55	NM	5.40
% of Influent at FP	*	*	57.6%	*	50.0%	8.8%	*	100.6%	*	*	*	NM	18.3%
BP Influent	2.50	12.59	67.97	10.30	0.05	20.40	4.17	119.33	5.58	1.31	1.00	5.13	5.96
% of Influent at BP	*	*	37.5%	*	40.0%	11.2%	*	95.5%	*	*	*	*	16.6%
Loading (lbs/day)													
	Cd	Cr	Cu	Pb	Hg	Ni	Ag	Zn	CN	As	Se	Sn	Mo
Background (FP District)	20.25	134.12	2682.10	578.69	2.54	241.51	22.51	12001.05	488.27	68.11	124.51	537.67	103.85
FP Influent	290.86	1251.76	5047.68	1348.16	5.02	2955.83	469.17	13036.65	1132.27	203.77	291.37	NM	607.00
% of Influent at FP	*	*	53.1%	*	50.6%	8.2%	*	92.1%	*	*	*	NM	17.1%
Background (BP District)	8.91	59.04	1180.65	254.74	1.12	106.31	9.91	5282.84	214.94	29.98	54.81	236.68	45.71
BP Influent	123.99	607.48	3252.02	508.69	2.37	954.63	205.84	5783.82	282.50	63.17	49.60	254.26	286.63
% of Influent at BP	*	*	36.3%	*	47.3%	11.1%	*	91.3%	*	*	*	*	15.9%

*These pollutants are regularly measured at or below the detection limit making it impracticable to accurately determine the POTW loading percentage.

Several pollutants are regularly measured at or below the detection limit in the plant influent as well as in the background sampling, which makes it impossible to determine an accurate POTW loading percentage. In 2016 these pollutants included cadmium, chromium, lead, and silver at both facilities as well as tin and selenium at Bucklin Point and arsenic, selenium, tin, and cyanide in the background source samples. These percentages are therefore not calculated in TABLE 22.

This direct comparison of concentrations and loading estimates gives some approximation of the contributions of these pollutants from background sources. Several aspects of the data analysis behind TABLE 22 should be noted. First, detection limit values were entered for samples with concentrations at or below the laboratory detection limits. This may lead to overestimation of concentrations and loadings from a particular source. Second, results of samples taken from both districts were used to determine the background concentrations. These concentrations were then multiplied by the average daily non-industrial flow rates to each facility to generate facility-specific loading estimates. In contrast, influent loadings are calculated based on both facility-specific influent

concentration and influent flow. Lastly, average influent concentrations were determined, while geometric means were calculated for the background data in order to reduce the impact of highly variable data on the comparison. These analytical differences, as well as the inexact pairing of data collections temporally, may lead to background concentrations that account for more than 100% of influent concentrations as well as discrepancies in the percent contribution of background sources when comparing concentrations and loading estimates. Despite these differences, this comparison provides useful information regarding the magnitude of the contributions of these metals coming from uncontrolled sources.

From TABLE 22 it is evident that a major portion of the influent copper, mercury, and zinc loadings observed at both facilities are from background sources. The sources of these background loading contributions are likely discharges from domestic users, street runoff, leaching from residential plumbing piping, and contaminated soils. In particular, it is apparent that most of the zinc (the trace metal with the highest concentration at the treatment plants and septage loads) is coming from non-industrial sources, as over 90% of the loading and concentrations from each plant can be accounted for in the background sampling.

TABLE 23 below shows the geometric mean concentration of all background metals and cyanide samples collected since 2002 in both NBC drainage areas. The lowest total metals concentration occurred in 2008, while the highest occurred in 2007. The total metals concentration of 148.85 ppb observed in 2016 was slightly higher than the 137.41 ppb concentration in 2015.

TABLE 23
Historical Background Metals and Cyanide Results 2002-2016 (ppb)

	Cd	Cr	Cu	Pb	Hg	Ni	Ag	Zn	CN	As	Se	Sn	Mo	Total Metals*
2002	0.40	5.93	32.18	11.22		6.66	0.85	99.52	4.59					156.76
2003	0.45	6.31	29.48	8.77		8.13	0.89	105.04	6.49					159.07
2004	0.68	2.99	36.49	10.79	0.07	6.21	1.79	102.49	6.58	1.01	0.76	6.31		161.51
2005	0.17	3.61	23.55	7.87	0.07	5.39	0.36	84.22	6.75	0.64	0.65	1.75	0.75	125.24
2006	0.14	4.49	24.80	6.65	0.03	5.76	0.28	90.05	4.81	0.99	0.65	0.95	0.68	132.20
2007	0.14	9.70	38.13	8.86	0.04	11.67	0.22	121.35	2.36	0.61	0.64	1.63	0.80	190.11
2008	0.12	4.07	19.88	6.77	0.04	5.11	0.13	64.17	3.82	0.80	0.99	1.45	0.80	100.29
2009	0.14	2.43	35.04	10.09	0.04	6.16	0.20	91.93	4.16	0.91	1.58	1.85	0.76	146.03
2010	0.13	1.78	22.68	7.11	0.04	4.05	0.14	85.54	3.84	0.66	1.36	2.55	0.74	121.47
2011	0.15	1.62	23.73	7.20	0.04	3.02	0.22	104.84	4.23	0.66	0.68	2.45	0.89	140.82
2012	0.15	1.32	25.86	5.92	0.03	2.65	0.26	100.60	4.55	0.55	0.60	5.37	0.81	136.79
2013	0.20	1.07	26.38	7.21	0.04	2.65	0.23	94.43	4.73	0.56	0.70	5.26	0.76	132.21
2014	0.21	1.27	39.78	6.98	0.04	2.43	0.23	122.09	5.14	0.59	1.02	5.00	0.93	173.03
2015	0.21	1.31	25.87	5.14	0.02	2.82	0.18	101.86	6.27	0.69	1.17	5.22	0.86	137.41
2016	0.19	1.27	25.46	5.49	0.02	2.29	0.21	113.92	4.64	0.65	1.18	5.10	0.99	148.85

*Total Metals= Cd+Cr+Cu+Pb+Hg+Ni+Ag+Zn

From this analysis, it is apparent that large percentages of the toxic pollutant loads to the Field's Point and Bucklin Point plants are from residential and other background sources that are beyond the control of the NBC regulatory program. Understanding non-industrial sources is important to permit development and planning to reduce loading to the treatment facilities and to Narragansett Bay. EMDA continues to improve and update studies of pollutant loads throughout the collection system using flow measurements, metering stations on NBC interceptors, and manhole monitoring data to choose study sites that will accurately describe mass loading from domestic sources, storm runoff, and major drainage basins.

Influent Loading Conclusions

The development of the National Pretreatment Program was a direct result of the Federal Water Pollution Control Act (Act) of 1972. The program was established at that time to monitor and regulate the introduction of pollutants from non-domestic sources into Publicly Owned Treatment Works (POTW). Section 307 of the Act required the Environmental Protection Agency to develop standards designed to:

- Prevent the discharge of pollutants which would interfere with POTW operation;
- Prevent the discharge of pollutants which would pass through the treatment works;
- Prevent the discharge of pollutants which would accumulate in POTW sludge thereby reducing the potential for beneficial reuse or reduce the opportunities for safe disposal or which would be otherwise incompatible with POTW operations.

In 1977 the Act was amended to include additional pretreatment requirements which made POTWs responsible for the establishment of local pretreatment programs to ensure compliance with EPA categorical pretreatment standards. Categorical standards have been developed to achieve a nationally uniform system of water pollution control for selected industries and pollutants. Local limits are intended to protect the wastewater treatment facility, the receiving waters, sludge quality, the health of the public and prevent environmental problems as a result of discharges from any non-domestic user.

The development of local limits is not a one-time event. Local limits are required to be periodically reviewed and revised to respond to changes in Federal or State regulations, environmental protection criteria, treatment facility design and operational criteria, and the nature of industrial contributions to POTW influent. The initial local limits for the Bucklin Point facility became effective in the late 1980s. Local limits for Field's Point were first developed in 1982 as part of the original NBC Pretreatment Program and were later revised by Pretreatment staff in 1987.

In 2004, NBC re-evaluated local limits for both facilities. The re-evaluation of these limits resulted in revised permit limits for several metals based on new EPA data handling methods and criteria in the updated Local Limits Development Guidance (issued in July 2004), as well as a special study of metals in NBC receiving waters. Between July 2001 and May 2002 a study was conducted by NBC, University of Rhode Island - Graduate School of Oceanography (URI-GSO), and MicroInorganics, Inc. to better understand metal partitioning in the Seekonk and Providence Rivers. Multiple transects during seasonal surveys were performed over complete tidal cycles to capture the *in-situ* metal partitioning between dissolved and particulate phases in these estuarine waters. Dissolved and particulate cadmium, copper, lead, nickel, and silver concentrations were analyzed and used to develop site specific metal translator values for each POTW. The metal translator is used to convert dissolved water quality criteria concentrations into total metal concentrations in order to calculate the effective total metals concentration, combined with dilution factors within the receiving waters, that correspond to a given water quality criterion.

As a result of an extensive review of the data from the metals study and facility data collected between January 2000 and June 2004, new MAHL values were calculated. The MAHL values represent the loadings that the treatment facilities can effectively treat without upset to plant operations or pass-through of toxins that could adversely affect water quality and aquatic life, while also allowing for the safe disposal of solids removed from incoming wastewater. The recommendations from this evaluation were documented in a Metal Compliance Plan that was submitted to DEM in September 2004.

TABLE 24 provides a comparison of the calculated MAHL goals with the total metal influent loadings for 2016. In the case of cyanide, loading goals for both plants were calculated using the EPA 20 ppb quantitation-based effluent permit limit. For Bucklin Point, copper loading goals were computed using the RIPDES effluent permit limits in the consent agreement. In most cases, it is clear that NBC is meeting the calculated loading goals at both wastewater treatment facilities with a considerable margin of safety. In 2016 there were no influent metals loadings that were above the MAHL. Meeting these goals attests to the overall effectiveness of NBC initiatives and measures to control pollutant input and effective removal during plant operations.

TABLE 24
Comparison of 2016 Influent Loadings to
Maximum Allowable Headworks Loadings (MAHL)

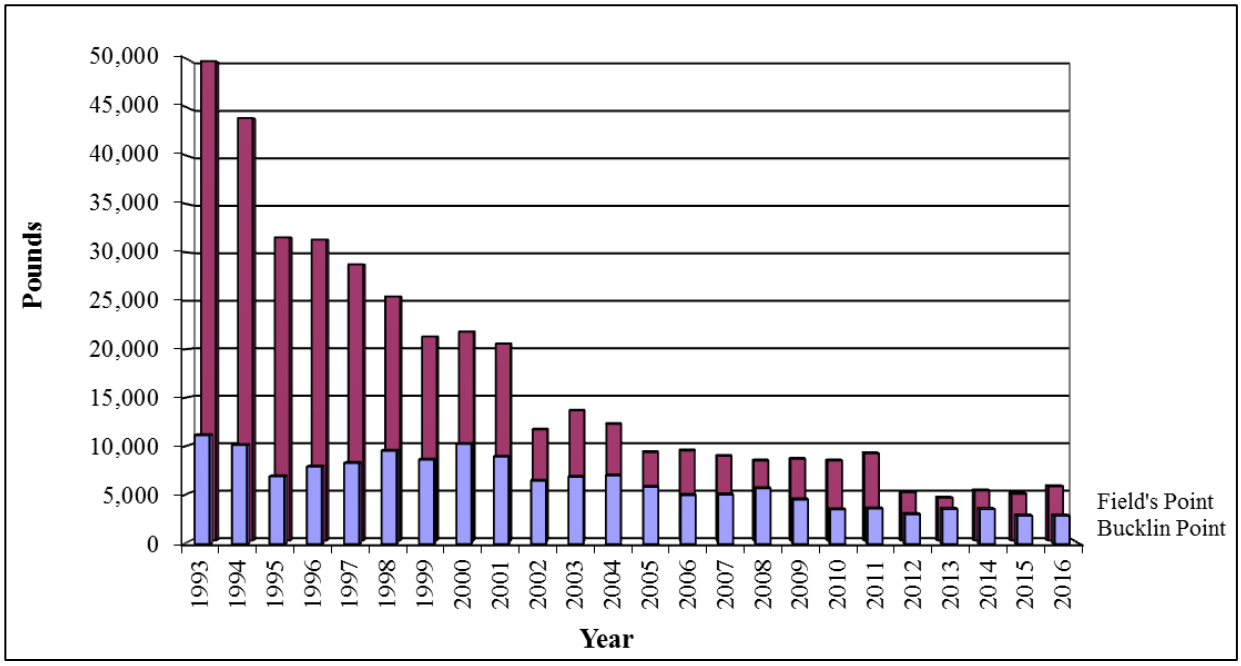
	Field's Point			Bucklin Point		
Parameter	**MAHL lbs/yr**	**2016 Loading lbs/yr**	**Below MAHL?**	**MAHL lbs/yr**	**2016 Loading lbs/yr**	**Below MAHL?**
Cadmium	2,227	290.9	Yes	511	124.0	Yes
Chromium	37,303	1,251.8	Yes	10,439	607.5	Yes
Copper	16,900	5,047.7	Yes	4,015	3,252.0	Yes
Lead	8,541	1,348.2	Yes	2,738	508.7	Yes
Mercury	183	5.0	Yes	11	2.4	Yes
Nickel	21,134	2,955.8	Yes	1,314	954.6	Yes
Silver	3,942	469.2	Yes	402	205.8	Yes
Zinc	50,005	13,036.7	Yes	16,498	5,783.8	Yes
Total Metals	140,235	24,405.3	Yes	35,928	11,438.8	Yes
Cyanide	4,453	1,132.3	Yes	2,446	282.5	Yes

The annual loading goals presented in TABLE 24 should only be used as an initial evaluation of a facility's ability to meet discharge compliance. Discharge permits enforce daily maximum and monthly average limits based on acute and chronic water quality criteria. While the annual means used to calculate the loadings and goals are instructive when evaluating facility function over longer time periods, meeting annual mean goals does not always translate to compliance with daily or monthly limits.

Analysis of Effluent Loading Data

This chapter attempts to quantitatively measure the results of the work of Pretreatment and ESTA by analyzing the loadings of toxics in the influent of the NBC facilities. It is also important to consider the discharge loadings into the receiving waters after wastewater treatment has been provided. Issues pertaining to these impacts are included later in this chapter and in CHAPTER VII. To maintain continuity with influent data, current and historical effluent data for both NBC facilities for the period from 1993 to 2016 were compiled and analyzed. The overall effluent trends are similar to those for the influent data, as concentrations and loadings have been decreasing over time at Field's Point and Bucklin Point.

FIGURE 23
NBC Total Metals Effluent Loadings Trend Analysis

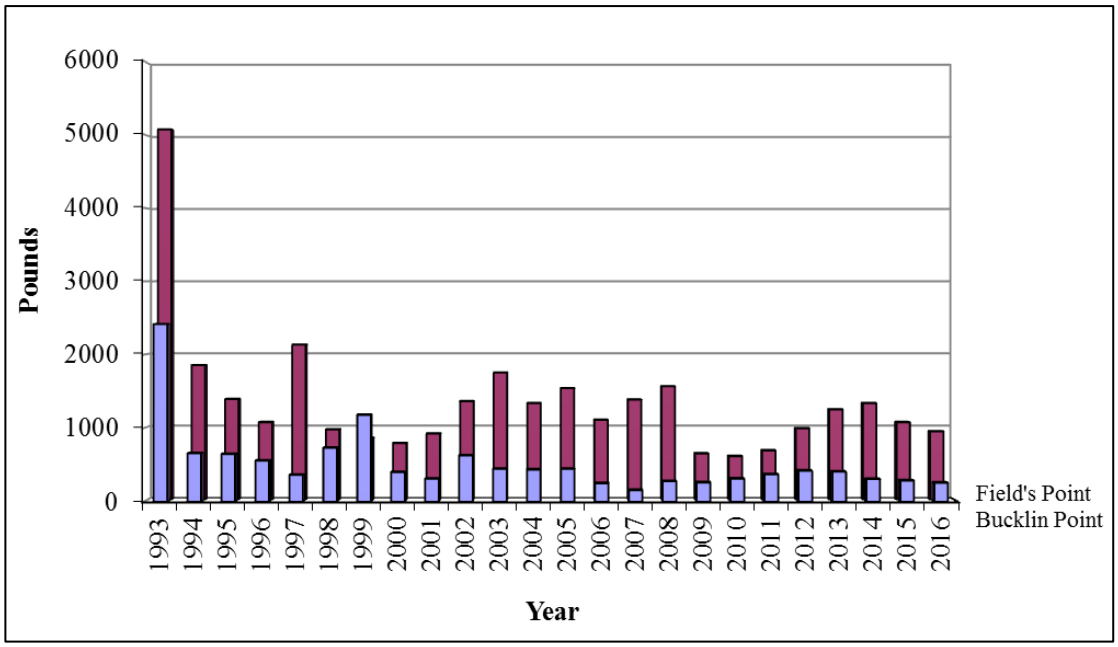


Historical total metals discharges from both NBC facilities are shown in FIGURE 23. It is important to note that the Field's Point facility handles approximately twice the flow volume of Bucklin Point. Total metals effluent loadings have been steadily decreasing at Field's Point since 1993 with some minor annual fluctuations. In 2016, total metals in the Field's Point effluent increased by 15.9%, or 773.8 pounds compared to 2015, while loadings in Bucklin Point effluent decreased slightly by 0.1% or 2.0 pounds. Since 2011, effluent metals loadings have been reduced by nearly half at Field's Point. This dramatic decrease may be attributable to BNR treatment technologies that began to come into operation at that plant in 2012. At Bucklin Point, effluent loading has been below 6,000 pounds since 2005, whereas prior to 2005 the average effluent loading was 8,554 pounds. As mentioned previously, throughout 2005 advanced treatment processes were brought online at the Bucklin Point facility contributing to improved total metals removal. The BNR facilities at Bucklin Point underwent an upgrade again in 2014, and effluent metals have again decreased the last two years. Overall since 1993, effluent metals from Bucklin Point have decreased by 74.0% and effluent metals at Field's Point have decreased by 88.7%.

As seen in FIGURE 24, effluent cyanide loadings also decreased in 2016, by 9.6% at Bucklin Point and by 11.8% at Field's Point. While this chapter presents the annual loadings of total cyanide, the NBC reports only available cyanide on Discharge Monitoring Reports (DMRs) submitted monthly to the DEM. At Bucklin Point, available cyanide

made up the majority of loadings, 77% in 2016, or 196.8 pounds compared to total cyanide annual loadings of 256.4 pounds. At Field's Point, available cyanide represented a smaller proportion, 56% of the total, or 530.7 pounds compared to total cyanide loadings of 947.3 pounds. These percentages are consistent with 2015 total versus available cyanide breakdowns.

FIGURE 24
NBC Cyanide Effluent Loadings Trend Analysis



Breakdown Analysis of POTW Effluents

The portioning of total metals loading in the effluent of each plant can be seen in FIGURES 25 and 26. The relative contributions show that zinc, copper, and nickel are the largest contributors in the effluent at both Field's Point and Bucklin Point. In 2016, these three metals accounted for 95.3% of the total metals effluent loading from Field's Point and 95.9% of total metals effluent loading for Bucklin Point. At both plants, nickel represents a higher percentage of the total metals in the effluent than in the influent due to its lower removal efficiency compared to the other metals. For example, at Field's Point nickel comprised 32.8% of the effluent totals versus only 12.1% of the influent. At Bucklin Point, nickel comprised 13.4% of the effluent versus only 7.1% of the influent.

FIGURE 25
Breakdown of Total Metals – Field's Point 2016 Effluent Loading

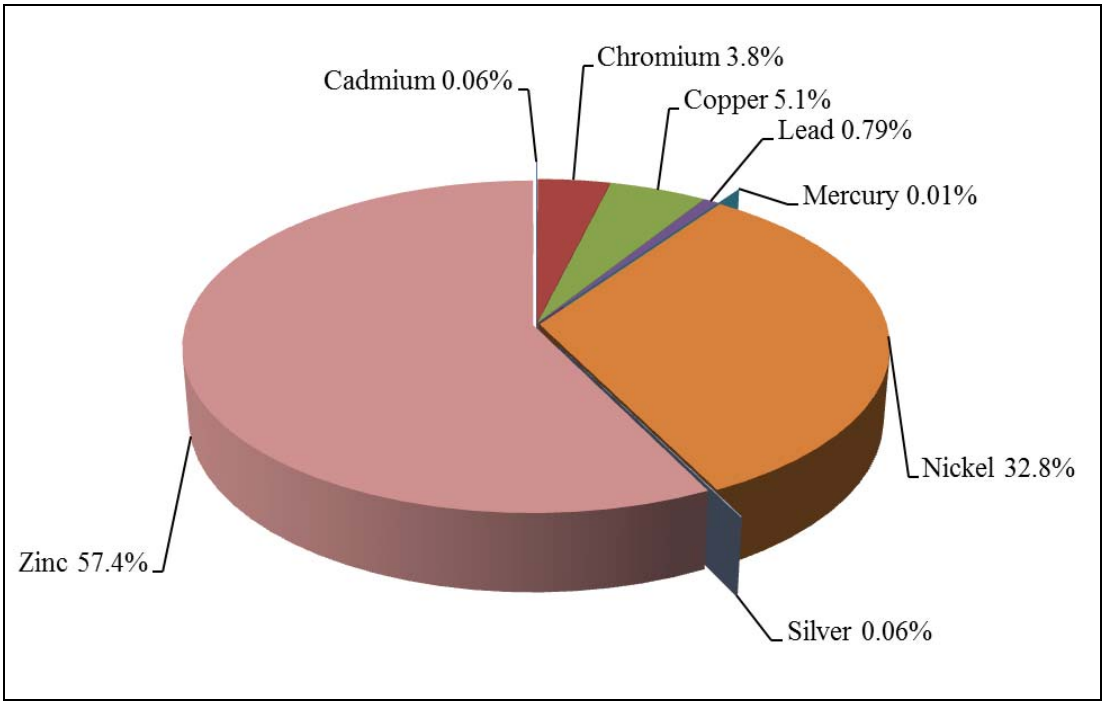
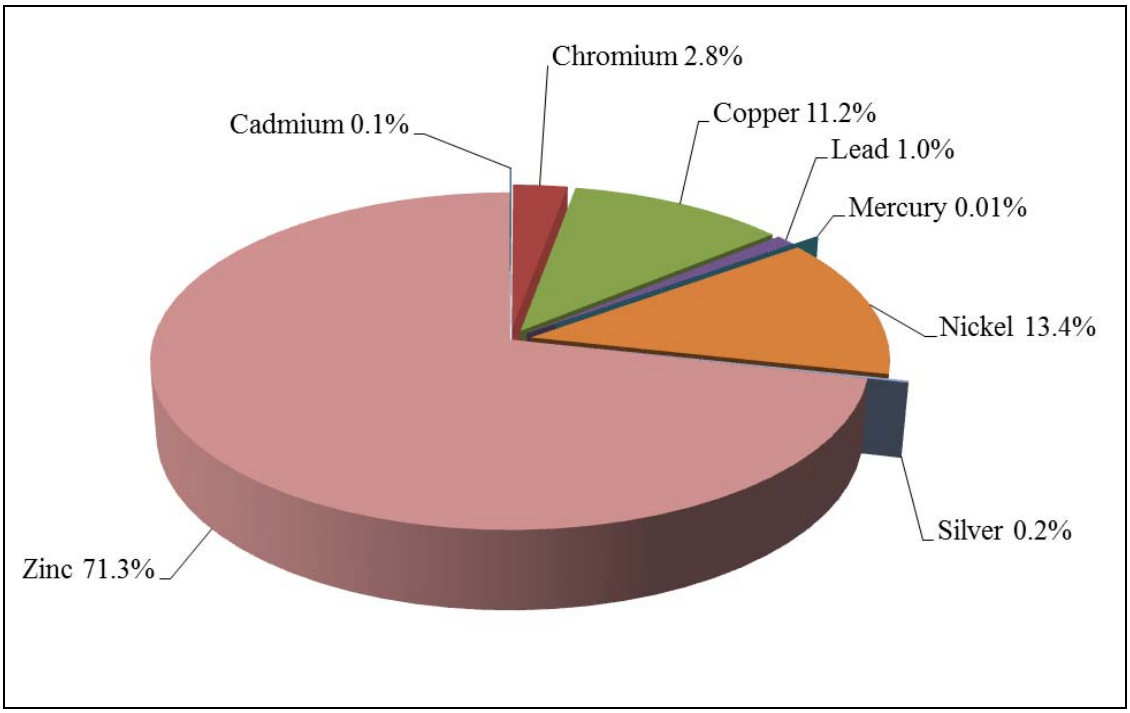


FIGURE 26
Breakdown of Total Metals – Bucklin Point 2016 Effluent Loading



Bioassay Data

The two NBC facilities are required to conduct quarterly bioassay studies to determine effluent toxicity to various test organisms. NBC conducts chemical analysis and aquatic toxicity testing, using the response of organisms to detect and measure the effect that substances, wastes, or environmental factors, have on these organisms. Effluent samples are collected only in dry weather, defined as no rain 48 hours prior to or during sampling. NBC met the quarterly bioassay sampling frequency requirements during 2016 for both facilities.

Effluent from each facility is tested for acute toxicity to the mysid shrimp *Americamysis bahia* and chronic toxicity to the sea urchin *Arbacia punctulata*. Results of the acute toxicity testing are analyzed to determine the LC_{50} and the A-NOEC statistics. The LC_{50} result is defined as the concentration of wastewater that causes mortality to 50% of the test organisms. A-NOEC or Acute-No Observable Effect Concentration is defined as the highest concentration of the effluent in which 90% or more of the test animals survive. Both NBC facilities have an LC_{50} permit limit requirement of 100% or greater, defined as a sample which is composed of 100% effluent; there are no monitoring requirements nor permit limits for A-NOEC for either POTW. The chronic toxicity test performed on *A. punctulata* examines the sublethal effects of effluent on the fertilization of eggs. The C-NOEC or Chronic-No Observed Effect is reported. The C-NOEC permit limit for Bucklin Point is 50% or greater while at Field's Point the permit requires monitoring only.

At Field's Point and Bucklin Point, all quarterly acute toxicity test results were 100% or greater for both the LC_{50} and A-NOEC (except for the second quarter where the A-NOEC was not calculated) indicating no observable effect of undiluted effluent on the study organisms.

In the chronic tests, the C-NOEC was 100% for all four quarters of testing for Bucklin Point, indicating no observable or adverse effect on the fertilization rates of *A. punctulata*. For Field's Point, the first, third, and fourth quarter results were 100% C-NOEC, while the second quarter was 50%. Results of the quarterly bioassay tests for 2016 are included in ATTACHMENT VOLUME II, SECTION 10.

RIPDES Compliance

Analysis of Toxic Pollutant Loadings for Discharge Monitoring Reports

The Laboratory strives to use analytical methods that are sufficiently sensitive in order to measure the concentrations of pollutants that are in the influent and effluent of each facility as accurately as possible. Oftentimes, some pollutants are present in such minute quantities that they cannot be detected by the analytical method that is appropriate for the sample matrix. There are various means of dealing with those results that are below a detection limit. In this report, all calculations have dealt with non-detectable results by

replacing them with one that is equal to the detection limit. This is the method that had been specified in RIPDES permits prior to 2010. Calculations have also been performed in this manner and reported in all previous Pretreatment Annual Reports. This method results in over-estimation of loading whenever there are results that are below the detection limit and will no longer necessarily correlate with the data that is reported to the DEM in our DMRs. This is a result of DEM changing the below detection limit reporting requirements beginning in September 2010. NBC is now required to replace non-detected results with a zero for the purposes of most DMR calculations. For fecal coliform, reporting methods were changed as of July 1, 2015. Prior to this date, any result that was reported at the detection limit of <2.0 MPN/100 mL was replaced with a 2 when calculating geometric means; after July 1st, any fecal coliform result that was reported as <2.0 MPN/100 mL was replaced with a result of 1 MPN/100 mL. For consistency with the reporting of data on the DMR, data in the following section for RIPDES permit compliance have been analyzed according to the current DMR methods.

Field's Point Facility

In September 1992, the DEM issued a RIPDES Permit for the Field's Point Wastewater Treatment Facility. The permit contained effluent limitations for priority pollutants for the first time in the history of the facility. In recognition that the Field's Point facility might not be able to immediately comply with all limitations, the DEM issued a Consent Agreement (RIA-029) in December 1992 that included adjusted effluent discharge limits. On December 31, 2001, Field's Point was issued a new permit. DEM and NBC resolved differences over the contested items in January 2004 and agreed to a new Consent Agreement, RIA-330, which went into effect on January 1, 2004. TABLE 25 lists the current permit limits for metals and cyanide and the Consent Agreement values, or interim limits, for the contested parameters. TABLE 25 also presents the measured maximum daily values and maximum monthly averages for the Field's Point facility for parameters of interest. It should be noted that available cyanide is reported in the table below as this is what the NBC reports on the DMR.

TABLE 25
Comparison of Field's Point RIPDES & Consent Agreement Limits with 2016 Wastewater Treatment Facility Results

	RIPDES Permit Limits		Consent Agreement Limits		2016 Results	
Parameter	Maximum Daily (ppb)	Average Monthly (ppb)	Maximum Daily (ppb)	Average Monthly (ppb)	Maximum Daily* (ppb)	Average Monthly* (ppb)
Copper	23	23	86.2	35.9	7.31	3.75
Mercury**	8.5	0.4	-	-	0.0073	0.0044
Nickel	332	127	-	-	25.91	19.71
Silver	10	-	-	-	0.20	0.06
Zinc	380	380	-	-	39.35	33.05
Available Cyanide**	4	4	49.6	20.0	6.27	1.49
BOD Percent Removal***	-	≥85%	-	-	-	97.2%
TSS Percent Removal***	-	≥85%	-	-	-	95.6%
Fecal Coliform	400 MPN/100 ml	200 MPN/100 ml	-	-	126.5 MPN/100 mL	3.8 MPN/100 mL
Americamysis bahia (LC_{50})***	100% or greater	-	-	-	>100%	
Arbacia punctulata (C-NOEC)***	---%	-	-	-	50%	

*For comparison to the RIPDES permits, the highest maximum daily value and the highest average monthly value reported for 2016 is listed in the table.

**Note that the limits for compliance/noncompliance determinations are based on the quantitation limit, which is defined as 0.2 micrograms per liter for mercury and 20.0 micrograms per liter for cyanide.

***Permit limits for percent removals and bioassays are set for the minimum, not maximum. The percent removal 2016 results represent the minimum average monthly percent removals. The bioassay 2016 results represent the minimum quarterly results.

TABLE 26 details the compliance status of the Field's Point facility with the limits established by the RIPDES permit and Consent Agreement in effect during 2016.

TABLE 26
2016 Compliance Status with RIPDES & Consent Agreement Limits for Field's Point Facility

Parameter	2016 Compliance with RIPDES Permit Limits?		2016 Compliance with Consent Agreement Limits?	
	Maximum Daily	Average Monthly	Maximum Daily	Average Monthly
Copper	Yes	Yes	Yes	Yes
Mercury	Yes	Yes	N/A	N/A
Nickel	Yes	Yes	N/A	N/A
Silver	Yes	Yes	N/A	N/A
Zinc	Yes	Yes	N/A	N/A
Available Cyanide	**No**	Yes	Yes	Yes
BOD Percent Removal	N/A	Yes	N/A	N/A
TSS Percent Removal	N/A	Yes	N/A	N/A
Fecal Coliform	Yes	Yes	N/A	N/A
Americamysis bahia (LC_{50})	Yes	N/A	N/A	N/A
Arbacia punctulata (C-NOEC)	N/A	N/A	N/A	N/A

TABLE 26 shows that in 2016, Field's Point was in compliance with the daily and monthly discharge limitations specified in the Consent Agreement for all toxic pollutant parameters listed in TABLE 26. However, additional work will be necessary to ensure NBC compliance with toxic pollutant discharge limits specified in the RIPDES permit for cyanide. All 2016 cyanide results were reported as "available cyanide" and no results exceeded the consent agreement limits. In 2016, 94% of effluent cyanide samples were reported below the detection limit of 4 ppb for available cyanide. Six samples exceeded the maximum daily permit limit of 4.0 ppb, though no samples exceeded the interim limit of 20.0 ppb.

The NBC met BOD and TSS percent removals in all months of 2016, as well as fecal coliform daily maximums and monthly averages. All bioassay result also met the permit limits in 2016.

The NBC is actively working to ensure full compliance with all the toxic and conventional pollutants specified in its RIPDES permit. In 2004, at the request of DEM, the NBC recalculated toxic pollutant permit limits based on the metal translator study conducted by NBC in years 2001 and 2002. The results of the metal translator studies performed by NBC found the Providence and Seekonk Rivers met water quality criteria for the trace metals analyzed: cadmium, copper, lead, nickel, and silver. This data resulted in both rivers being removed from the EPA 303(d) list of impaired waterbodies for metals.

Bucklin Point Facility

When the NBC acquired the Bucklin Point facility in 1991, the RIPDES permit originally issued to the Blackstone Valley District Commission in December 1990 remained in effect. This permit listed several discharge limits for metals, organic compounds, and nutrients, but was modified to reflect alternative effluent limits when the NBC stressed that permitted discharge levels for some pollutants were not attainable. A new permit was issued to the facility on December 31, 2001.

NBC contested the new permit limits for copper, mercury, nickel, silver, zinc, cyanide, and nutrients, and for TSS and BOD during rain events when primary effluent would be diverted to the chlorine contact tank. NBC contested the above parameters due to the inability to meet limits that were set as low as saltwater primary contact water quality criteria in certain cases. Consent Agreement RI-330 was issued, which imposed interim limits effective as of January 2004, which are currently being used to measure compliance. As mentioned in the previous section, NBC has presented to DEM new information from water quality monitoring on the Seekonk River, the receiving waters for the Bucklin Point facility, and is awaiting approval of new permit limits. The study data show that the Seekonk River meets water quality criteria for metals outside of the mixing zones assigned to the outfall.

TABLE 27 outlines the RIPDES permit limits, current Consent Agreement limits, and a summary of 2016 effluent results. TABLE 28 indicates that the facility was unable to meet the originally issued Maximum Daily and Average Monthly permit limits for copper and cyanide; in contrast, the facility was able to meet the limits detailed in the Consent Agreement for each of these parameters. There was one exceedance of the fecal coliform Maximum Daily permit limit in 2016, during the month of June; this parameter does not have Consent Agreement Limits.

TABLE 27
Comparison of Bucklin Point RIPDES & Interim Effluent Limits with 2016 Wastewater Treatment Facility Results

	RIPDES Permit Limits		Consent Agreement Limits		2016 Results	
Parameter	Maximum Daily (ppb)	Average Monthly (ppb)	Maximum Daily (ppb)	Average Monthly (ppb)	Maximum Daily (ppb)	Average Monthly* (ppb)
Hexavalent Chromium	997	60	-	-	0.00	0.00
Copper	5.2	5.2	86.1	29.8	29.42	10.66
Lead	199	10.3	-	-	2.88	1.23
Mercury**	1.7	0.04	1.7	0.2	0.03	0.01
Nickel	67	13.7	67	53.3	28.86	12.45
Silver	-	2	4.5	-	1.94	0.35
Zinc	76	76	88	76	73.40	53.05
Available Cyanide**	0.8	0.8	69.3	20	8.96	1.12
BOD Percent Removal***	-	≥85%	-	-	-	96.9%
TSS Percent Removal***	-	≥85%	-	-	-	92.7%
Fecal Coliform	400 MPN/100 ml	200 MPN/100 ml	-	-	759.27	8.15
Americamysis bahia (LC_{50})***	100% or greater	-	-	-	>100%	-
Arbacia punctulata (C-NOEC)***	50%	-	-	-	100%	-

*The highest average monthly value reported for the year is listed in this table for comparison against the RIPDES permit.

** Note that the limit for compliance /noncompliance determinations is based on the quantitation limit, which is defined as 0.2 micrograms per liter for mercury and 20.0 micrograms per liter for cyanide.

***Permit limits for percent removals and bioassays are set for the minimum, not maximum. The percent removal 2016 results represent the minimum average monthly percent removals. The bioassay 2016 results represent the minimum quarterly results.

TABLE 28
2016 Compliance Status with RIPDES & Consent Agreement Limits for Bucklin Point Facility

	2016 Compliance with RIPDES Permit Limits?		2016 Compliance with Consent Agreement Limits?	
Parameter	Maximum Daily	Average Monthly	Maximum Daily	Average Monthly
Hexavalent Chromium	Yes	Yes	N/A	N/A
Copper	**No**	**No**	Yes	Yes
Lead	Yes	Yes	N/A	N/A
Mercury**	Yes	Yes	Yes	Yes
Nickel	Yes	Yes	Yes	Yes
Silver	N/A	Yes	Yes	N/A
Zinc	Yes	Yes	Yes	Yes
Available Cyanide**	**No**	**No**	Yes	Yes
BOD Percent Removal	N/A	Yes	N/A	N/A
TSS Percent Removal	N/A	Yes	N/A	N/A
Fecal Coliform	**No**	Yes	N/A	N/A
Americamysis bahia (LC_{50})	Yes	N/A	N/A	N/A
Arbacia punctulata (C-NOEC)	Yes	N/A	N/A	N/A

**Note that the limit for compliance /noncompliance determinations is based on the quantitation limit, which is defined as 0.2 micrograms per liter for mercury and 20.0 micrograms per liter for cyanide.

Bucklin Point did not have any permit violations of the Consent Agreement Limits in 2016. In addition, bioassay results met limits for both acute (LC_{50}) and chronic (C-NOEC) RIPDES permit requirements throughout 2016, further confirming the successful control of toxic contaminants entering the Bucklin Point facility.

Bucklin Point Final Effluent pH Variability and Permit Compliance

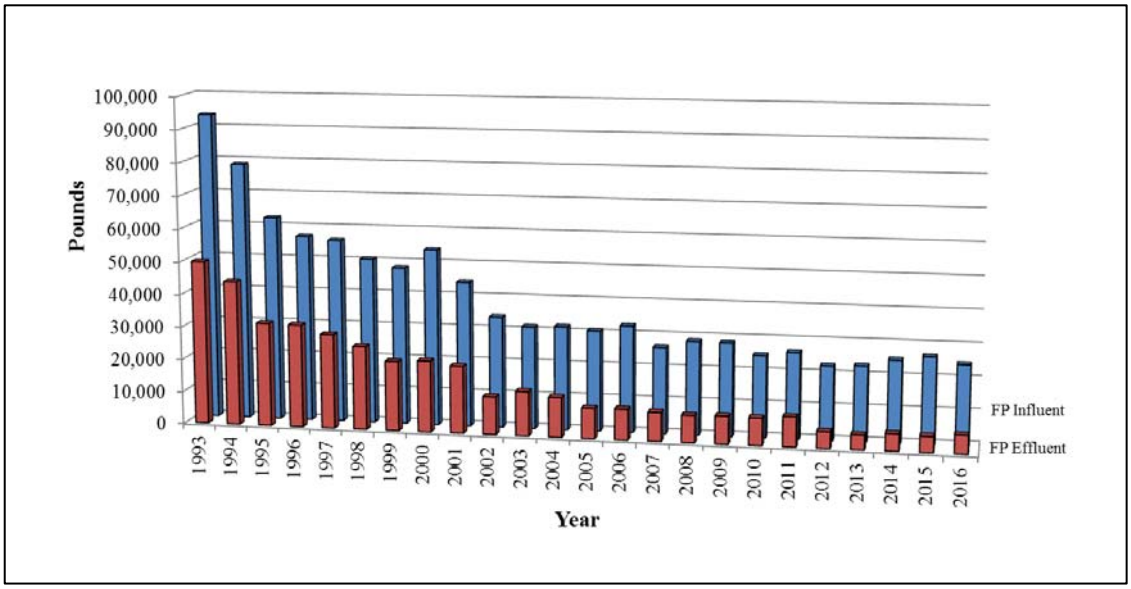
The pH of the Bucklin Point effluent is measured daily by EMDA staff with the use of a high precision Orion pH meter. This analytical program is under the supervision of the NBC Laboratory. The addition of soda ash (sodium bicarbonate) to the process at Bucklin Point enables more effective biological nutrient reduction and typically maintains the effluent pH within the desired permit range. The range of values measured for 2016 was between 6.10 and 7.30 s.u. This range does not include results from December 27th through December 31st as results on these dates were determined by EMDA to be invalid.

The lack of pH permit violations over the course of 2016 reflects the success of the NBC Bucklin Point Operations staff and the Pretreatment program, which prevented the discharge of low pH wastewater by industry.

Comparison of Influent and Effluent Loadings

FIGURE 27 provides a comparison of historic Field's Point influent and effluent loadings for total metals. At the Field's Point facility, a major portion of each metal observed in the plant influent is removed in grit and sludge during the treatment process.

FIGURE 27
Field's Point Influent and Effluent Total Metals Loadings Trend Analysis



The removal rate of metals entering the Field's Point facility varied from 37.7% to 99.3% in 2016. Influent loadings decreased by of 7.4%, or 1,958.3 pounds in 2016 as compared to 2015. Effluent loadings increased by 773.8 lbs, or 15.9% in 2016. Since the plant upgrades associated with the nitrogen removal process went into operation at Field's Point, removal efficiencies for metals have increased substantially.

FIGURE 28 provides a comparison between the historic influent and effluent total metal loadings for Bucklin Point. As noted for the Field's Point facility, a major portion of each pollutant observed in the plant influent is removed in grit and sludge during the treatment process. In 2016 there was a 1,962.6 pound, or 14.6% decrease in influent metals, while effluent metals increased by a minor 1.6 pounds, or 0.1% over 2015 loadings. Percent removal of the various metals at Bucklin Point ranged between 59.0% and 98.0%.

FIGURE 28
Bucklin Point Influent and Effluent
Total Metals Loadings Trend Analysis

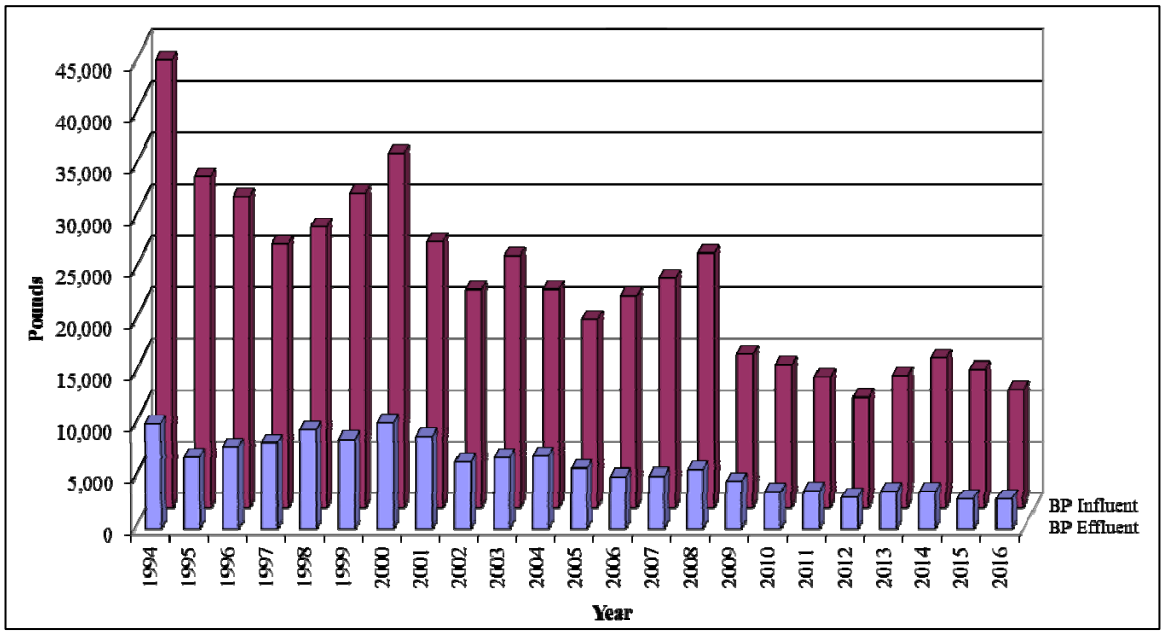


TABLE 29 details removal rates for each of the heavy metals and cyanide at both NBC wastewater treatment facilities. The term "removal" here means the reduction of pollutants in the wastewater through their incorporation into settleable solids, which are then concentrated into sludge material. Municipal wastewater treatment plants are not designed to treat and remove industrial waste such as heavy metals. Those metals that are strongly associated with the dissolved phase (e.g., nickel) will be discharged to the receiving waters with less removal than those with higher particulate phase partitioning (e.g., copper or lead) which are particle reactive and settle into the sludge. Several influent and effluent metals measured at the plants are often non-detectable by the appropriate Laboratory method applied. The metals shown with asterisks in the table below are frequently non-detectable and therefore are statistically analyzed at their detection limits, resulting in overestimation of these concentrations. From TABLE 29 it is easy to see that a major portion of all toxic pollutants are removed from the wastestream at the NBC plants prior to effluent discharge to the receiving waters of Narragansett Bay. The Field's Point facility was able to remove 83% or more of the cadmium, chromium, copper, lead, mercury, and silver discharged in the Field's Point district, while 86% or more of the cadmium, chromium, copper, lead, mercury, and silver loadings were removed at Bucklin Point. Nickel had the lowest percent removal rates of the heavy metals with removal rates of 37.7% and 59.0% for the Field's Point and Bucklin Point facilities respectively.

TABLE 29
Percent Removal of Metals and Cyanide for NBC Facilities

	Field's Point Concentrations			Bucklin Point Concentrations		
	Influent (ppb)	Effluent (ppb)	% Removal	Influent (ppb)	Effluent (ppb)	% Removal
Cadmium	2.50*	0.03*	98.9%	2.50*	0.05	98.2%
Chromium	10.81*	1.85	82.9%	12.59*	1.79	85.8%
Hex. Chromium	NM	NM	NM	39.36	10.00*	74.6%
Copper	44.18	2.44	94.5%	67.97	6.81	90.0%
Lead	11.59*	0.38	96.7%	10.30*	0.61	94.0%
Mercury	0.044	0.003	92.5%	0.049	0.005	90.8%
Nickel	26.01	16.20	37.7%	20.40*	8.37	59.0%
Silver	4.03*	0.03*	99.3%	4.17*	0.12	97.0%
Zinc	113.28	27.62	75.6%	119.33	43.21	63.8%
Total Cyanide	9.72	8.03	17.4%	5.58	5.24*	6.1%
Total Metals	212.45	48.55	77.15%	276.67	70.97	74.4%

*25% or more sample results were non-detectable and were analyzed at the detection limit.

POTW Effluent Dissolved Metals Study

In 2000, the NBC began a study to monitor the dissolved metals fraction of the effluent discharged to the receiving waters of the Providence and Seekonk Rivers. Dissolved metals were typically analyzed once per week at each POTW. Total metals were measured twice weekly. In 2016, Field's Point and Bucklin Point effluent dissolved metals samples were analyzed monthly. The NBC and DEM use these data to better understand the fate, effect, and physical phase partitioning of metals discharged from the POTWs.

Understanding the partitioning between dissolved and particulate phases is important for the calculations of permit discharge limits. POTWs are permitted for total metals; however the limits are derived from receiving water quality criteria set for dissolved metals concentrations, the phase that is more readily absorbed by marine life. Therefore, when determining permit limits for a wastewater treatment plant, the DEM must use a "metal translator conversion factor" to estimate the fraction of the POTWs' total metals load that will be in the dissolved phase in the effluent. By sampling for total and dissolved metals, the NBC is able to better assess the ratio of dissolved to total metals in POTW effluent and in the receiving waters and inform such permit limit calculations.

TABLE 30 summarizes the data from 2016 as dissolved-to-total metals ratios. The values were calculated for each date there was a dissolved metals result (i.e., once per month), using the dissolved metals concentration and the total metals concentration for that day. Annual averages were then calculated from these monthly data. The dissolved phase is operationally defined as that portion which passes through a 0.45 micron filter. At Field's Point, some of the dissolved aluminum, cadmium, lead, and silver samples were reported at less than the detection limit (between 33-92% of all samples). Similarly, at Bucklin Point some dissolved cadmium, lead and silver samples were reported at less than the detection limit 17-25% of all samples). Also, some effluent total cadmium samples at both plants were reported at less than the detection limit. Note that averages were calculated for these metals using substitution of the detection limit value, therefore overestimating the true concentrations.

TABLE 30
2016 Final Effluent Phase Partitioning Study Results

Dissolved/Total Shown as a Fraction		
	Field's Point Mean	**Bucklin Point Mean**
Cadmium	0.95	0.80
Chromium	0.99	0.97
Copper	1.08	0.75
Lead	0.85	0.68
Nickel	0.98	1.10
Silver	0.89	0.39
Zinc	0.99	1.01
Aluminum	0.42	0.43
Iron	0.50	0.47

At Field's Point the results of this study show chromium, copper, nickel, and zinc to be the elements with the highest fraction in the dissolved phase, followed by cadmium, lead, and silver in the final effluent. At Bucklin Point, nickel and zinc were shown to be the elements with the highest fraction in the dissolved phase, followed by cadmium, chromium, and copper. Iron was more strongly associated with particles, and thus the fraction of the metal in the dissolved phase is lower.

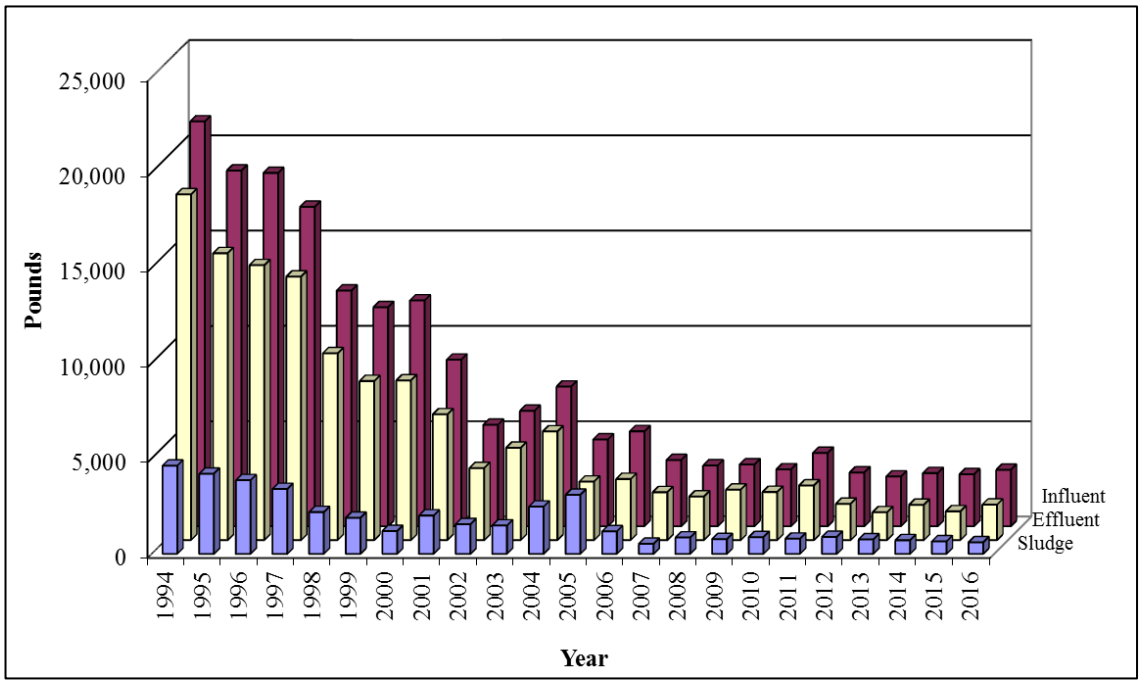
Mean proportions of zinc and nickel at Bucklin and copper at Field's Point were above 1.0, indicating a higher concentration in the dissolved phase than was detected in the analysis of the total metal. The low removal efficiency of this metal supports that the majority is likely in the dissolved phase. In addition, there are occasionally instances in which the dissolved metals portion is higher than the effluent portion due to equipment precision. Data for 2016 total and dissolved metals analysis results are included in ATTACHMENT VOLUME II, SECTION 10.

Sludge Analysis

To provide further insight into influent trends and POTW removal efficiency for metals, sludge loading trends for three metals have been compared to influent and effluent loads since 1994 at each facility. Nickel was chosen for this comparison due to its high incidence in the dissolved phase. Nickel is also a metal commonly associated with industrial sources. Copper was also chosen due to its relatively high abundance and dissolved partitioning. Zinc was selected because of its relative abundance and significant influent loadings. In the following figures, please note that the final sludge loading is an approximation since there is insufficient data for loading attributed to grit. During 2016, sludge metals measurements were conducted bimonthly as opposed to weekly for the years prior to 2006. The mass balance agreement of these metals is calculated by subtracting the effluent and sludge loadings from the influent loading. Historical and 2016 sludge data are included in ATTACHMENT VOLUME II, SECTION 10.

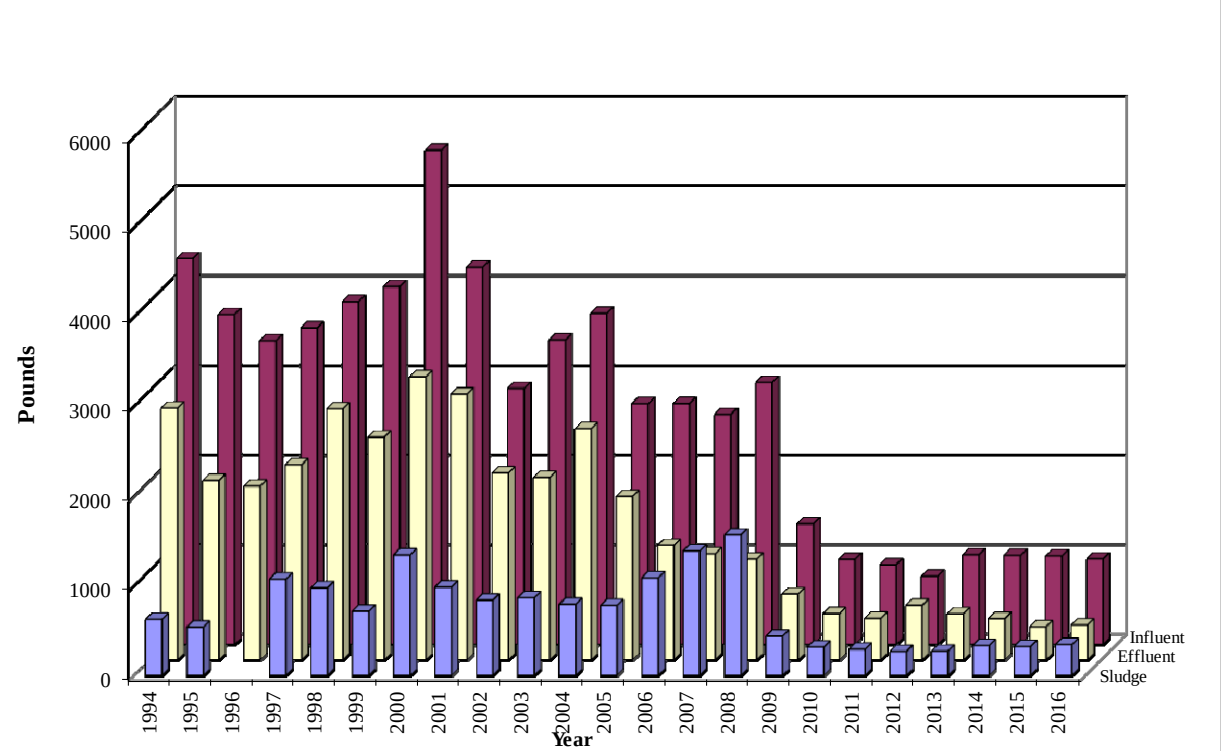
As can be seen in FIGURE 29, nickel inputs in Field's Point influent generally declined from 1994 to 2008; loadings have been relatively steady since then. Note that the center row of columns on the figure represents final effluent loading. During 2016, Field's Point nickel loading increased slightly in the influent and effluent but decreased in the sludge as compared to 2015. Nickel in the sludge has remained below 1,000 pounds since 2007. The discrepancy between influent nickel loading compared to sludge and effluent nickel loadings was 20% during 2016. This discrepancy is attributed to loading in grit and general variability due to sampling and analysis methods.

FIGURE 29
Nickel Loading Trend Analysis for Field's Point
Sludge, Influent, and Effluent



At Bucklin Point, nickel loading decreased in the influent but increased in the effluent and sludge during 2016 as compared to 2015. As can be seen in FIGURE 30, influent nickel decreased by 32.7 pounds, while effluent nickel increased by 20.4 lbs., and nickel in the sludge increased by 24.2 pounds. In 2016, there was a 29% discrepancy between measured influent loading and loading in the effluent and sludge. This discrepancy is attributed to loading in the grit and general variability due to sampling and analysis methods.

FIGURE 30
Nickel Loading Trend Analysis for Bucklin Point
Sludge, Influent, and Effluent



*Sludge data for year 1996 is not included due to mid-year changes in sludge handling

Nickel has the lowest removal efficiency of all of the metals measured in the influent and effluent at either plant, due in part to its high incidence in the dissolved phase. This results in relatively low loading of nickel to the sludge at either plant.

FIGURES 31 and 32 show the loading trends for zinc at the Field's Point and Bucklin Point facilities, respectively. Zinc loading at Field's Point decreased in the sludge and influent, but increased in the effluent in 2016. The discrepancy between Field's Point influent zinc loading and the combined sludge and effluent zinc was 21%. At Bucklin Point, zinc loading decreased in the influent, but increased in the sludge and effluent. The discrepancy at Bucklin Point was just 2%. These discrepancies can be attributed to loading in the grit.

FIGURE 31
Zinc Loading Trend Analysis for Field's Point
Sludge, Influent, and Effluent

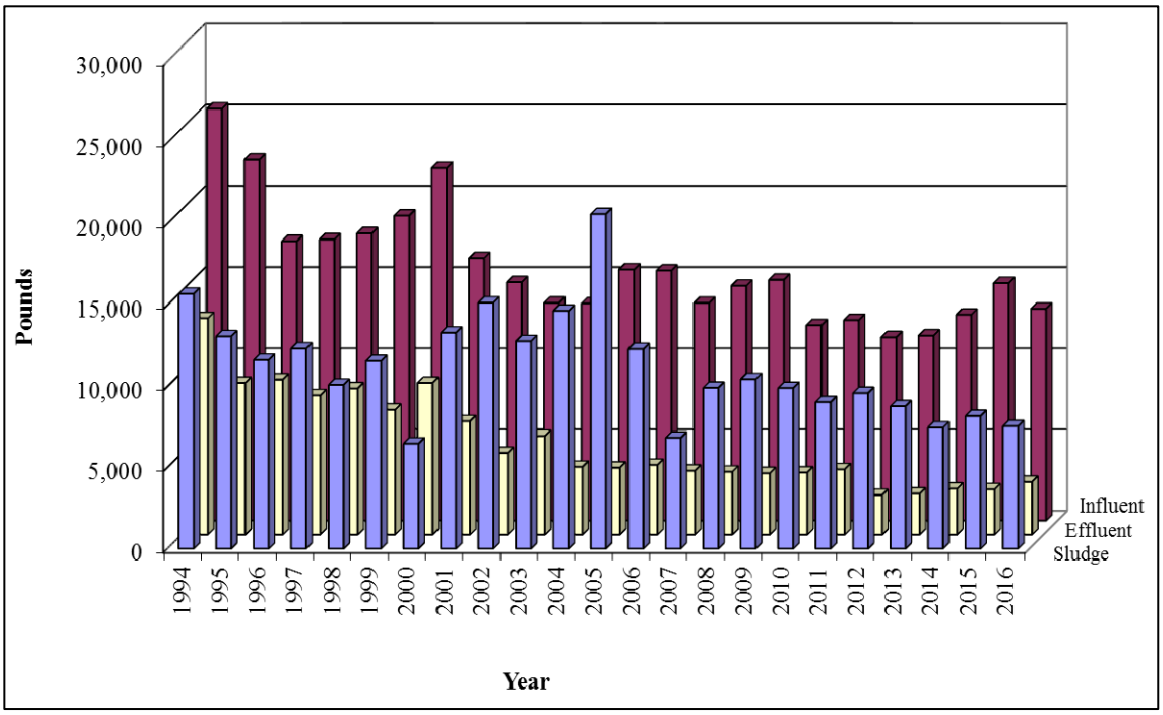
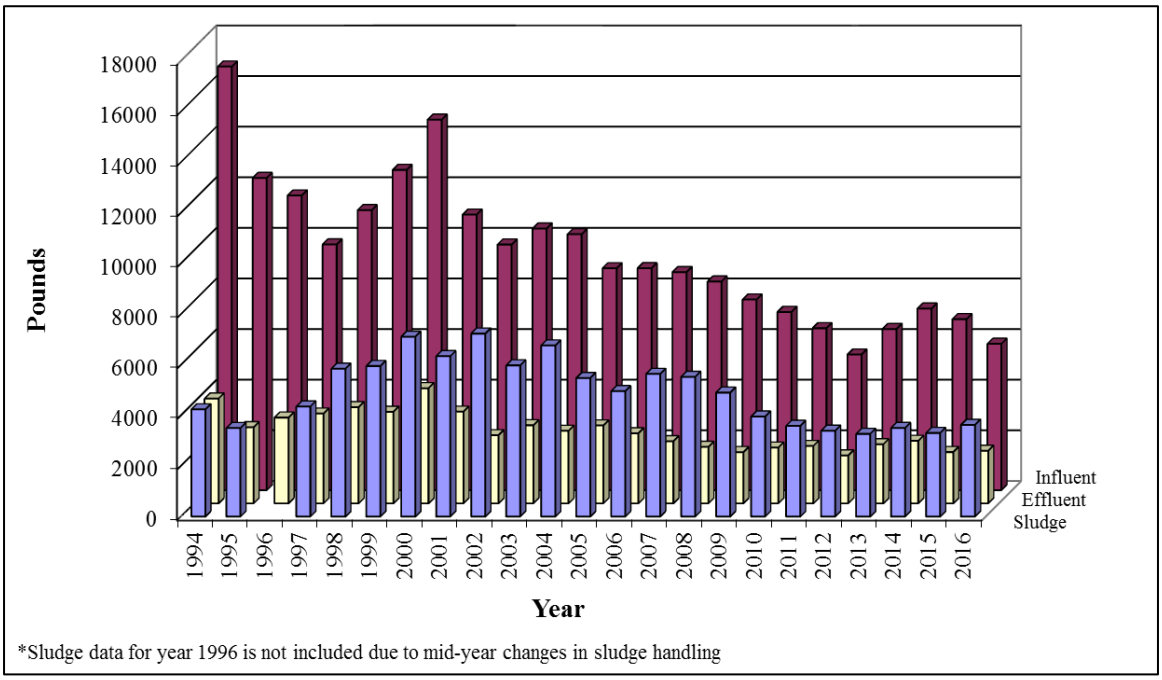


FIGURE 32
Zinc Loading Trend Analysis for Bucklin Point
Sludge, Influent, and Effluent



*Sludge data for year 1996 is not included due to mid-year changes in sludge handling

FIGURES 33 and 34 present the copper loading trend analyses. At Field's Point, copper loading decreased in the influent, effluent, and sludge in 2016 when compared to 2015. The discrepancy between the influent and the combined effluent and sludge loading was 37%. At Bucklin Point, copper loadings decreased in the influent and effluent, but increased in the sludge. The discrepancy between the influent and combined effluent and sludge loading was 2%. These discrepancies can be attributed to loading in the grit.

FIGURE 33
Copper Loading Trend Analysis for Field's Point
Sludge, Influent, and Effluent

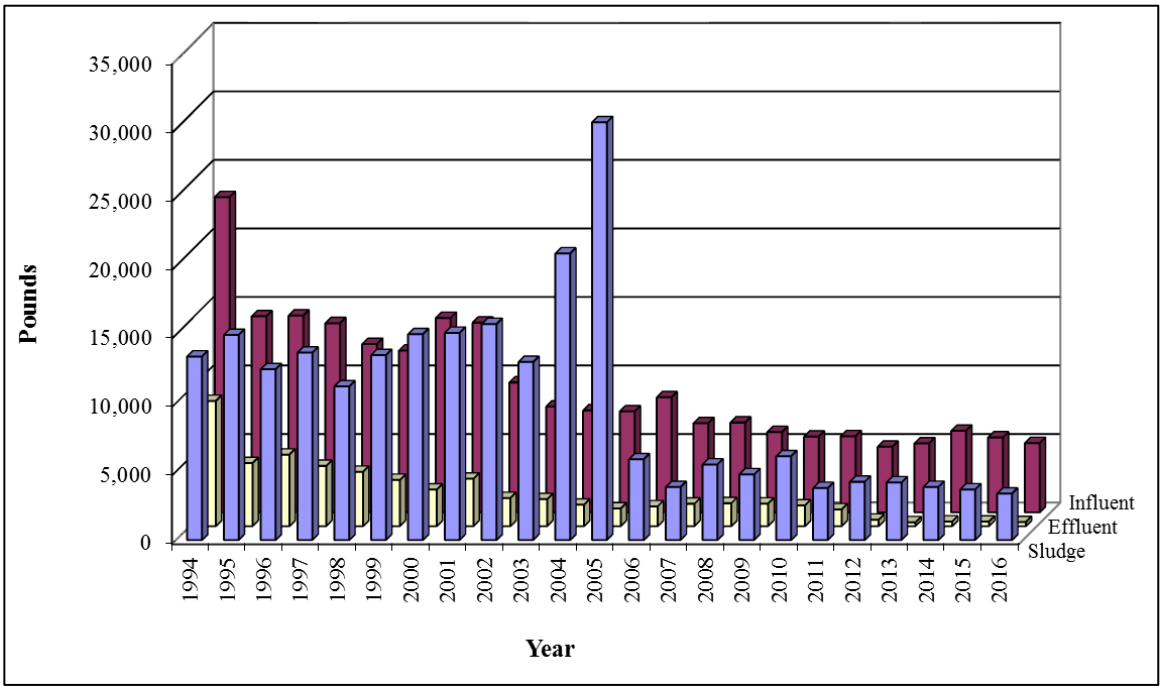
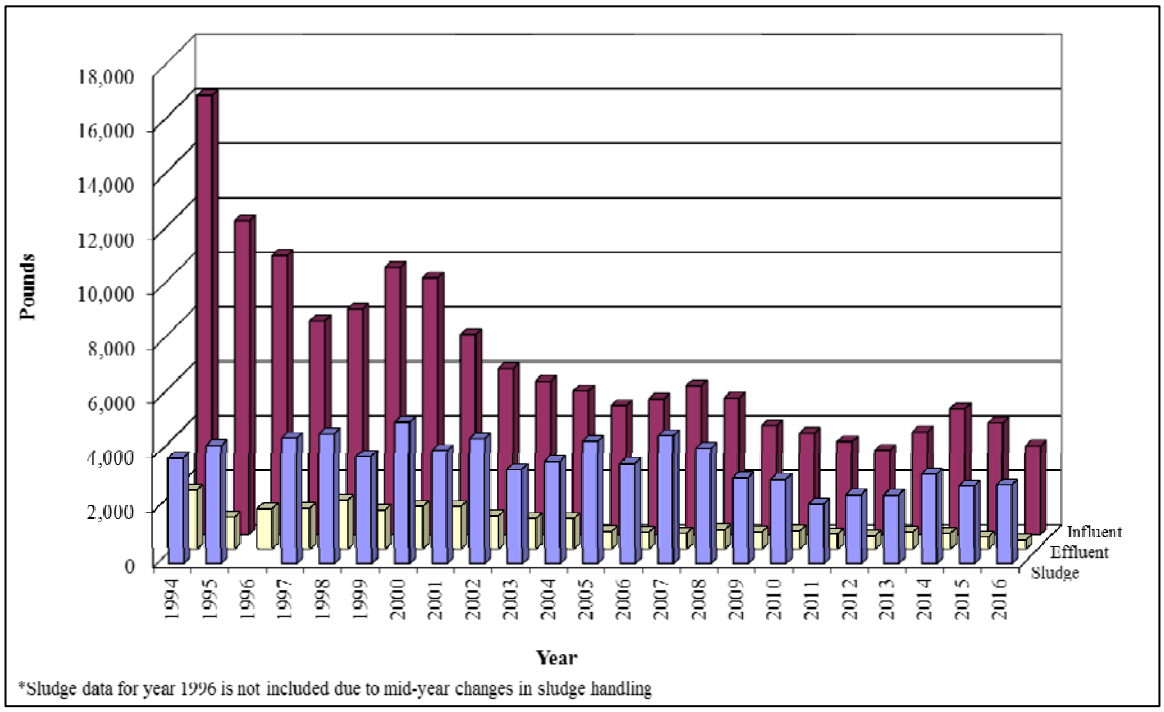


FIGURE 34
Copper Loading Trend Analysis for Bucklin Point
Sludge, Influent, and Effluent



BOD and TSS Loadings

BOD and TSS loading historical trend analysis provide an interesting means of determining the ability of the individual facility to handle variability in influent loadings without disruption of plant operations. For Bucklin Point, FIGURES 35 and 36 show the 30-day averaged trend for influent and effluent BOD and TSS, respectively. Effluent BOD and TSS at Bucklin Point show a decline and overall reduction in variability beginning in 2005 which is largely attributable to improved treatment processes as a result of comprehensive facility upgrades which began to go online that year.

FIGURE 35
BOD Loading Trend Analysis for Bucklin Point Influent and Effluent

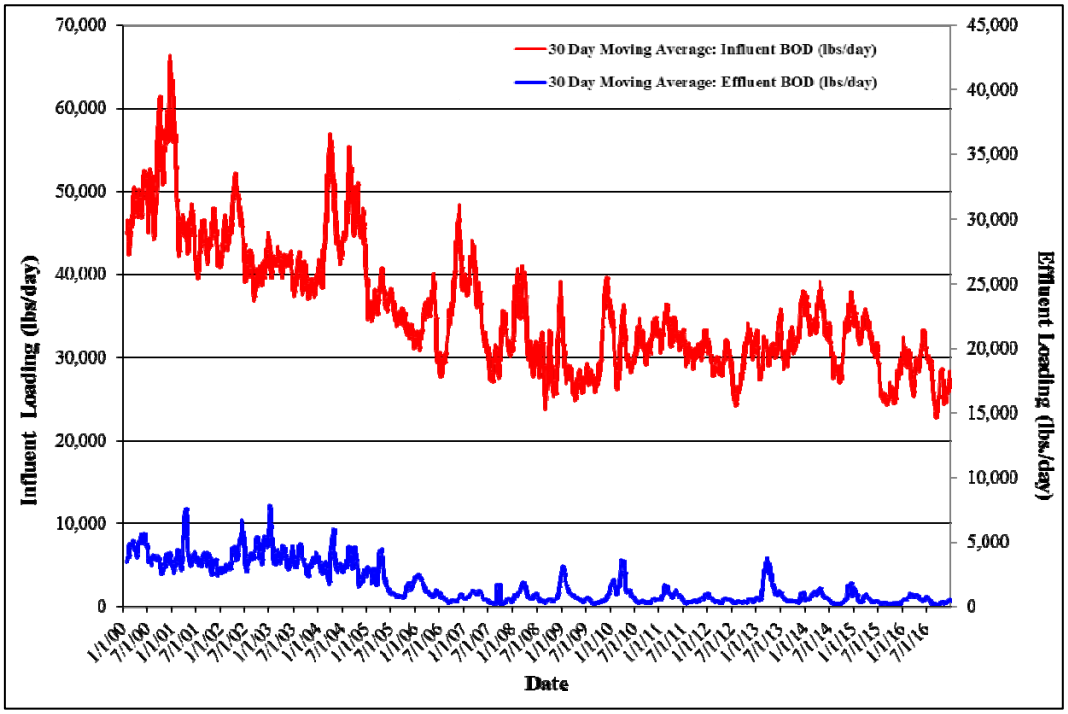
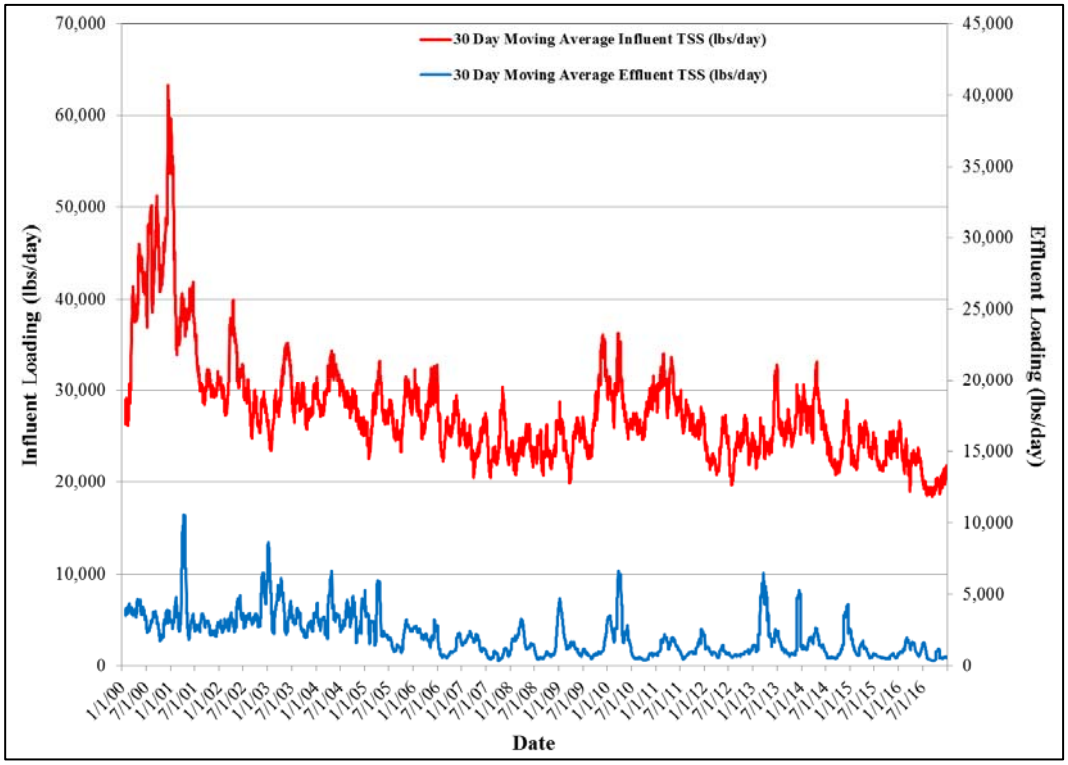


FIGURE 36
TSS Loading Trend Analysis for Bucklin Point Influent and Effluent



FIGURES 37 and 38 show the 30-day averaged BOD and TSS data for Field's Point. Periods of high influent loading are possibly attributable to maintenance within the collection system, or wet weather events. It is estimated that at Field's Point flow coming from the CSO tunnel accounts for about 3.8% of the influent BOD and about 6.2% of the influent TSS loading. It is interesting to note that, despite these transient increases in the influent loading rates, effluent loadings show very little variability. This demonstrates the buffering capacity of both facilities, the ability of Operations to effectively adjust conditions to treat incoming pollutants, and an overall improvement in the removal of these conventional pollutants. FIGURES 36 and 37 below show less variable effluent BOD and TSS and a decline in effluent BOD and TSS beginning in 2012 at Field's Point, which is most likely attributable to plant upgrades associated with the new BNR treatment process, parts of which became operational in 2012.

FIGURE 37
BOD Loading Trend Analysis for Field's Point Influent and Effluent

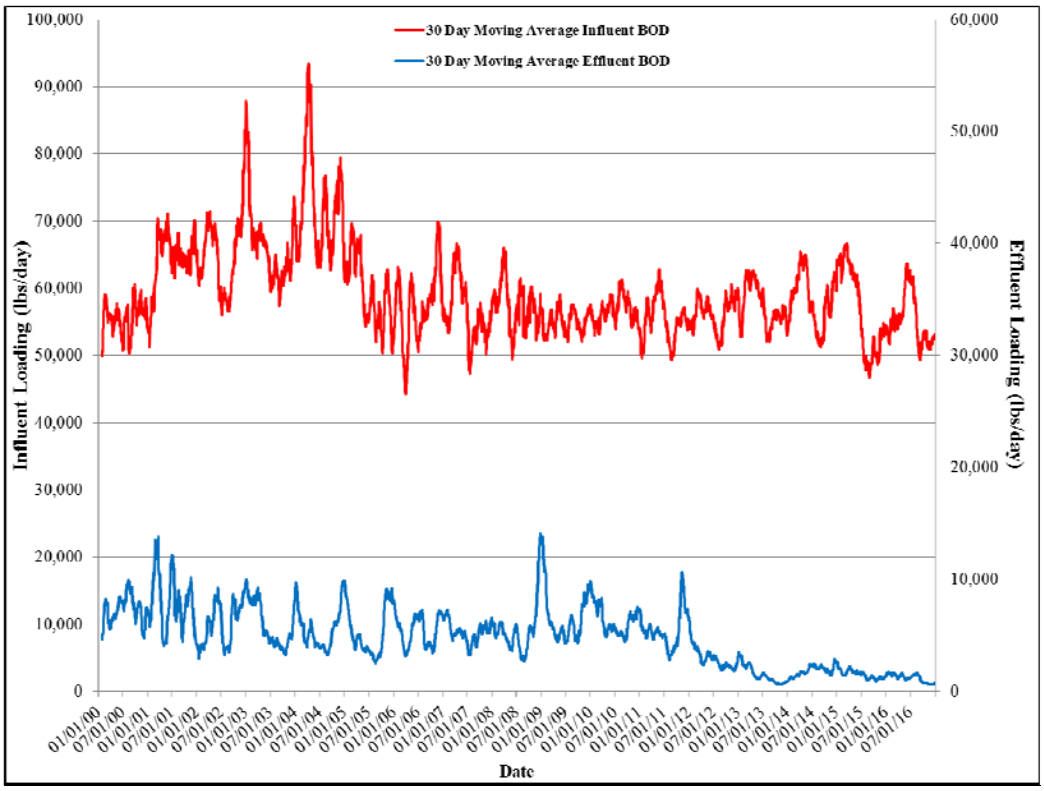
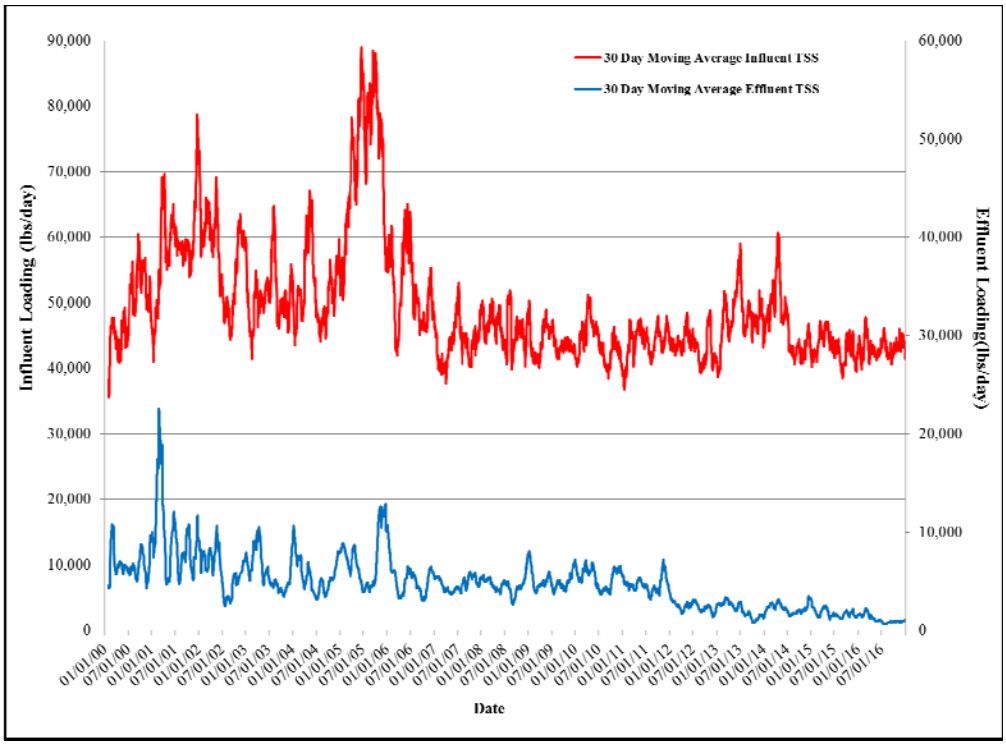


FIGURE 38
TSS Loading Trend Analysis for Field's Point Influent and Effluent



Comparison of Final Effluent Concentrations in 2016 and Saltwater Water Quality Criteria for Receiving Waters

A comparison of final effluent concentrations of permitted parameters and water quality criteria is useful to evaluate potential impact of the treatment plants on the receiving waters. TABLE 31 lists measured dissolved and total metal concentrations in the effluent, as well as cyanide, pH, and fecal coliform bacteria compared to saltwater water quality criteria determined by DEM. Comparisons are made between annual averages and chronic criteria that protect long-term exposure, and between annual maxima and acute criteria that are established to protect marine life and waters from short-term exposures to pollutants. Effluent concentrations bolded in TABLE 31 exceeded those water quality standards. Dissolved metals are measured monthly at the two plants and total metals are measured twice weekly. Saltwater water quality criteria are set for dissolved metals, based on a metal translator conversion factor, converting from total to dissolved phase. Default EPA conversion factors range from 0.83 to 1.0, a ratio without units. Dissolved concentrations in the effluent can be compared to the water quality criteria with the understanding that dilution occurring in the established mixing zones at the outfalls quickly lowers the concentrations in the Bay waters. This was demonstrated in the 2001 and 2002 trace metal study of the Bay waters by NBC, URI, and MicroInorganics, Inc. The trace metal study conducted by NBC and URI in 2001 and 2002 found both the Seekonk and Providence River reaches of Narragansett Bay meeting EPA water quality criteria for metals. These findings were presented to DEM, and as a result of this work, the Seekonk and Providence Rivers have been removed from the state's EPA 303(d) list of impaired water bodies for metals.

TABLE 31
Comparison of 2016 Final Effluent Concentrations and Water Quality Criteria of Receiving Waters

Pollutant	Phase and Statistical Category	Bucklin Point Effluent Results in ppb	Field's Point Effluent Results in ppb	Chronic WQC in ppb	Acute WQC in ppb
Copper	Dissolved phase effluent annual average	**5.1**	2.5	3.1	
	Dissolved phase effluent annual maximum	**10.3**	4.8		4.8
	Total effluent annual average	6.8	2.4		
	Total effluent annual maximum	29.4	7.3		
Lead	Dissolved phase effluent annual average	0.42	0.30	8.1	
	Dissolved phase effluent annual maximum	1.1	0.31		210
	Total effluent annual average	0.60	0.40		
	Total effluent annual maximum	2.9	1.2		
Nickel	Dissolved phase effluent annual average	8.1	**15.6**	8.2	
	Dissolved phase effluent annual maximum	18.2	19.4		74
	Total effluent annual average	8.4	16.2		
	Total effluent annual maximum	28.9	25.9		
Silver	Dissolved phase effluent annual average	0.04	0.02		
	Dissolved phase effluent annual maximum	0.08	0.02		1.9
	Total effluent annual average	0.10	0.00		
	Total effluent annual maximum	1.9	0.20		
Zinc	Dissolved phase effluent annual average	44.8	28.1	81	
	Dissolved phase effluent annual maximum	71.1	35.3		90
	Total effluent annual average	43.2	27.6		
	Total effluent annual maximum	73.4	39.4		
Mercury	Dissolved effluent annual average	NM	NM	0.94	
	Dissolved effluent annual maximum	NM	NM		1.8
	Total effluent annual average	0.00	0.00		
	Total effluent annual maximum	0.03	0.01		
Total Cyanide	Total effluent annual average	**5.2**	**8.0**	1	
	Total effluent annual maximum	**15.2**	**15.4**		1
pH	Total effluent annual minimum (s.u.)	6.1	6.2	> 6.5 < 8.5	
	Total effluent annual maximum (s.u.)	7.3	7.3		> 6.5 < 8.5
Fecal Coliform Bacteria	Total effluent annual geometric mean (MPN/100 mL)	4.2	2.4	50	
	% > 400 MPN/100 mL	0.66%	0.13%		< 10%

*NM – not measured

From TABLE 31, the following conclusions can be made regarding the various pollutant parameters:

- Dissolved copper concentrations at Field's Point met both the chronic water quality criterion and the acute water quality criterion for annual average and annual maximum, though dissolved copper concentrations at Bucklin Point did not meet either criterion. However, effluent concentrations are rapidly diluted as the effluent enters the receiving waters. It is often difficult for wastewater effluent to meet the receiving water quality criteria for copper since the limit in drinking water is over 400 times higher than the limit in the receiving waters.

- Lead continues to show annual average and maximum dissolved concentrations substantially lower than the chronic and acute water quality criteria at both facilities. The annual maxima for total lead at both Field's Point and Bucklin Point are nearly two orders of magnitude lower than the acute dissolved lead criterion.

- The dissolved nickel annual maximum concentrations at both facilities were below the acute saltwater quality criterion. However, the dissolved nickel annual average effluent concentration did not meet the chronic water quality criterion at Field's Point. As noted above for copper, effluent concentrations are rapidly diluted as the effluent enters the mixing zone of the receiving waters, reducing the effective concentration of these metals in the environment.

- The dissolved silver annual maximum and average concentrations as well as total silver annual average and maximum were all below the acute water quality criterion. There is no chronic saltwater water quality criterion established for silver.

- Maximum and average values for both total and dissolved zinc at both facilities are less than the chronic and acute criteria.

- Total mercury, at both facilities, had annual averages roughly ten times lower than the chronic and acute water quality criteria.

- The average annual effluent total cyanide concentration and annual maximum were above the chronic and acute water quality criteria at both Field's Point and Bucklin Point. Though the effluent did not meet these criteria, effluent concentrations are rapidly diluted as the effluent enters the mixing zone of the receiving waters. Cyanide loadings at both facilities have generally decreased over time.

- Hydronium ion concentration, or pH, annual effluent minima were below the 6.5 minimum water quality criteria though maxima are within water quality criteria at both plants. Though effluent pH was sometimes below the minimum criterion, such low pH results are often associated with heavy rainfall events, and are thus out of the control of treatment processes and not recorded as RIPDES permit violations.

- The annual geometric mean of all fecal coliform bacteria sample results was used to determine whether the facilities met the chronic water quality criterion for fecal coliform, while a count of the number of samples that exceeded 400 MPN/100 mL was used to establish whether the acute water quality criterion was met. Both facilities remained well below the 50 MPN/100 mL chronic water quality criterion and the acute criterion of no more than 10% of samples exceeding the 400 MPN/100 mL threshold. Less than 1% of the fecal coliform samples at Bucklin Point (0.66%) and Field's Point (0.13%) were above 400 MPN/100 mL threshold in 2016.

Summary

In general, the two POTWs continue to show significant improvements in operations and effluent quality since NBC took over operations and with the implementation of the NBC Pretreatment Program and Pollution Prevention initiatives of the ESTA Section. The Pretreatment and ESTA Sections have implemented educational programs to assist firms in achieving and maintaining compliance. The NBC has also significantly improved sampling methods over the past several years, and improved sampling of septage and sludge have shown clear results. The aim of the EMDA sampling program is to collect representative samples at every stage, reduce contamination, and provide valuable information to POTW and regulatory staff in order to protect the environment and serve the public interest. The Laboratory section continues to improve analytical procedures and research new technologies to improve the accuracy of all analytical results of this sampling. The Field's Point and Bucklin Point treatment plant upgrades have clearly resulted in not only reduced nutrients but improved effluent quality for a multitude other parameters as well.

While NBC studies show that substantial portions of influent toxic metal pollutants originate from residential sources, the overall toxic pollutant loadings to the two NBC wastewater treatment plants have decreased over time. This is a clear reflection of the fine work done by the NBC toxic reduction and control programs. The influent metals loading from 2015 to 2016 decreased at both NBC plants; Bucklin Point had a decrease of 14.6% while Field's Point had a decrease of 7.4%. These changes in loading appear to have been insignificant to plant processes. The levels of toxics in the effluent discharged from Bucklin Point decreased slightly this year, while Field's Point had a slight increase, though both NBC plants remained far below historical loadings. In 2016, effluent total metals loadings increased at Field's Point by 15.9%, or 773.8 pounds, and decreased at Bucklin Point by 19.3%, or 695.1 pounds. Overall, 2016 effluent loadings continue to support the 2002 removal of NBC receiving waters from the EPA 303(d) List of Impaired Waters by the DEM. This is a clear testament to the effectiveness of the NBC toxic reduction and control programs.

VI. ENFORCEMENT

NBC Enforcement Actions

The NBC will initiate some type of enforcement action against 100% of those persons and companies who violate the NBC Rules and Regulations. A wide range of enforcement actions are used to bring industrial and commercial users into compliance with NBC requirements and effluent limitations. The action can be as routine as a telephone call or as serious as an administrative order and assessment of penalty. Hundreds of phone calls were made during 2016 and 1,878 Notices of Violation (NOV) were issued for various violations of NBC Rules and Regulations. The following is a description of the most common types of enforcement actions utilized by the NBC and a brief summary of the number of each type initiated by the NBC over the past year:

- *Telephone calls* to users are made daily to discuss violations and problems. These calls are often sufficient to bring the user into compliance. A telephone log sheet documenting the conversation is prepared and placed in the user file or in some cases a letter may be sent to the user summarizing the discussion.

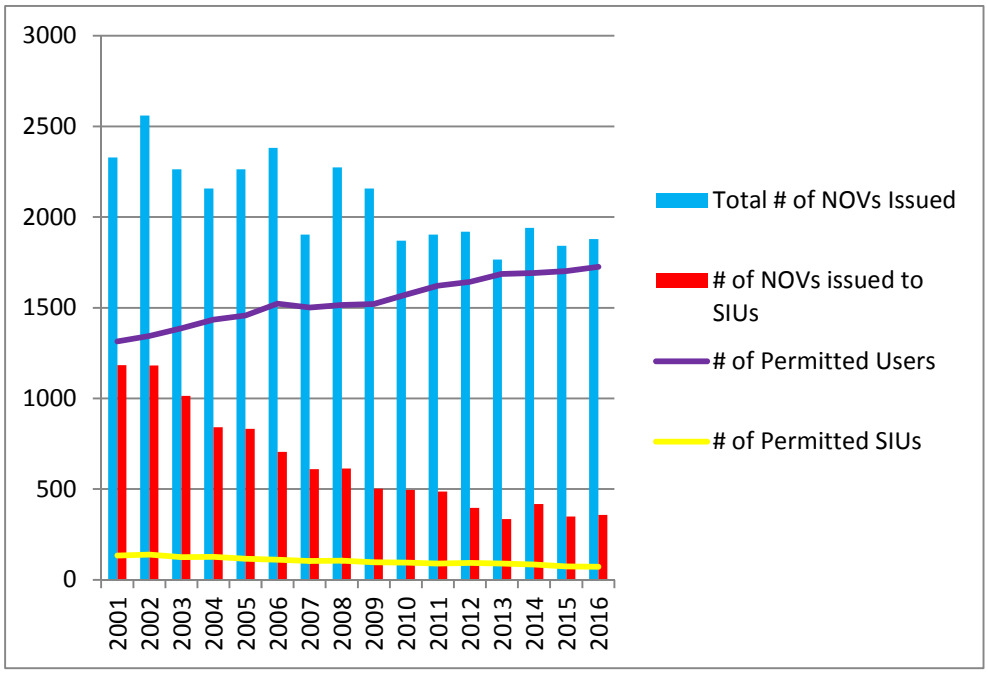
- *Notices of Violation* are issued by the NBC to inform a user of its noncompliance with NBC Rules and Regulations and warn the user that escalated enforcement action may result for continued noncompliance. These letters can be computer generated or may be tailored by the Pretreatment staff. An NOV specifically states that its issuance does not prohibit additional enforcement action. It also informs the violator that the non-compliance may result in publication of the firm's name in The Providence Journal and explains that inclusion on that list will subject the violator to liability for payment of the publication. In addition, NOVs refer the user to free technical and compliance assistance from the ESTA Section. The most typical NOVs are described below. TABLE 32 describes each type of NOV that is issued and the number of each issued in 2016. Examples may be viewed in ATTACHMENT VOLUME I, SECTION 4.

TABLE 32
2016 Notices of Violation

NOTICE OF VIOLATION	DESCRIPTION	NUMBER ISSUED IN 2016
Letter of Deficiency	• Issued by certified mail • Notifies users of deficiencies identified during inspections • Requires corrective actions with specific due dates	114
Failure to Meet Standards	• Issued when NBC or user self-monitoring results indicate a violation of NBC or EPA discharge limitations including monthly average limits • Requires an increase in sampling frequency	167
Notice of pH Violations	• Issued each time a user violates the high or low pH limit as indicated on the user monthly pH report	123
Failure to Submit Monitoring Reports	• Issued monthly to users that fail to submit a Self-Monitoring Compliance (SMCR), pH Monitoring, Zero Discharge Certification or Best Managing Practices (BMP) reports on time	654
Failure to Complete or Sign Required Reports	• Issued to users that do not complete or sign SMCRs or pH Monitoring Reports	1
Failure to Sample and/or Analyze for All Parameters	• Issued to users that did not sample for and/or analyze all required parameters required by their permits	1
Failure to Immediately Report Violations	• Issued to users that fail to notify the NBC within 24 hours of becoming aware of violations of NBC discharge limits in accordance with 40CFR403.12(g)(2)	38
Failure to Satisfy NBC Requirements	• Issued to users that fail to submit required documents or exceeding required completion dates	461
Failure to Pay Permit Fees	• Issued to users greater than 90 days late in paying permit fees	319
Total Notice of Violation Letters Issued		**1,878**

FIGURE 39 graphically shows the number of NOVs issued to all users, the number of NOVs issued to SIUs and the number of permitted users for the period of 2000 through 2016. As can be seen, the total number of NOVs issued is relatively consistent from year to year. There was a 2.6% increase in the number of NOVs issued to SIUs in 2016 when compared to 2015. However, the number of NOVs issued to SIUs has steadily declined from 2000 to 2016. In fact the number of SIU NOVs decreased by 74.5% since 2000. The number of permitted users increased steadily since 2000. For the period of 2000 to 2016 there has been an overall increase of 33.0% in the number of permitted users. This drastic decrease in the number of NOVs issued to SIUs and the declining trend observed in NOVs issued to all users since 2000, considering the increase in the number of permitted users, can be attributed to the educational efforts of the Pretreatment and ESTA Sections.

FIGURE 39
NOVs ISSUED TO ALL USERS AND SIUs 2000 – 2016



- *Letters of Wastewater Discharge Permit Suspension* are typically issued to SIUs who have not discharged process wastewater to the NBC sewer system for at least 30 days. These letters are issued by the Executive Director. During 2016, the NBC did not issue any letters of suspension. These letters require the user to permanently disconnect the final process discharge line from the NBC sewer line due to their potential to adversely impact the NBC should illegal or unpermitted discharges occur. The suspension of a user permit relieves the user from having to submit monthly monitoring reports. Inspections of these users by Pretreatment staff are still conducted since they still have the potential to impact the NBC sewer system.

- *Annual publication* of user names in the state's largest daily paper will result if a violator meets the criteria for Significant Non-Compliance as defined in 40CFR 403.8(f)(2)(vii). All NOV letters issued during the preceding year contained language warning the industrial user that the name of their firm would be published if their outstanding violation was not quickly corrected. Despite these warnings, the names of eleven firms found to be in SNC with NBC regulations were listed in an advertisement in the PROVIDENCE JOURNAL on February 23, 2017 for violations occurring between October 1, 2015 and December 31, 2016. A copy of this public notice is provided later in this chapter in FIGURE 40.

- *Meetings with users* are held to discuss problems or violations the firm may be experiencing and often produce good results. Before initiating an administrative action and/or assessing an administrative penalty, the parties may reach a resolution of the issues without further enforcement action. At these meetings, the user is informed of its potential financial liability should its non-compliance status continue, often resulting in compliance.

- *Administrative Orders* (AO) are Orders issued by the NBC to address repeated or serious instances of noncompliance. AOs are classified into one of four general types; Compliance Orders, Cease and Desist Orders, Consent Orders/Settlement Agreements and Termination/Suspension of Permit/Service Orders. The AO may or may not assess an administrative penalty. Depending on the type of AO issued, the user may be required to immediately cease discharging or achieve compliance with NBC Rules and Regulations within a specified time frame. AOs are considered the harshest control vehicle for ensuring compliance with NBC regulations. All AOs entitle the alleged violator the right to request a hearing before an independent hearing officer with regard to both the issue of compliance and penalties. AOs are issued by the NBC Chief Legal Counsel.

- *Civil Suits* are filed against users for nonpayment of pretreatment fees or to enforce the terms of an Administrative Order, Consent Order or Final Decision and Order. Depending on the amount outstanding, the suits are filed either in District or Superior Court. These suits are filed only after all other collection avenues have been attempted and were unsuccessful. Firms may pay in full, establish a payment schedule or negotiate a settlement as a result of these suits. During 2016, no civil suits were filed.

2016 Administrative Orders

During 2016, the NBC issued two Administrative Orders (AO) for violations of NBC Rules and Regulations and/or permit requirements and sought to resolve one pending AO from 2015. A sample AO is provided in ATTACHMENT VOLUME I, SECTION 4. Furthermore, a history of all enforcement actions taken by the NBC as of December 31, 2016 is found at the end of this chapter in TABLE 34. The table provides a history of the penalties assessed, the penalties paid and the present status of each enforcement action. A brief summary to update the status of pending Administrative Orders is provided later in this chapter.

Field's Point District

- AO #FP-01-15 was issued against DFI-EP, LLC, a metal finishing company, on January 14, 2016. The AO cited this company for failure to meet effluent discharge limitations for twenty-six (26) exceedences since beginning operations in May of 2014. These twenty-six (26) exceedance included three (3) cadmium violations, two (2) copper violations, eleven (11) nickel violations, three (3) zinc violations, and seven (7) cyanide violations. The AO stated that DFI-EP must submit a proposal to the NBC to reduce effluent concentrations to comply with the Permit, implement the plan after review and approval by the Pretreatment Section, and pay an Administrative Penalty of $23,500.00. On February 2, 2016 NBC held a status conference with representatives from DFI-EP, LLC. During this meeting the company stated repairs had been made to address the violations and it was developing standard operating procedures to address house keeping issues. In addition the company stated that it had expended over $23,000 on repairs and improvements to the pretreatment system. The company was required to submit financial information regarding these expenditures. A Consent Order (CO) was negotiated and executed on November 10, 2016. The CO required the company to achieve and maintain compliance, purchase equipment to conduct inhouse analytical testing, conduct monthly training of its employees and pay an administrative penalty of $8,000. The NBC agreed to conduct a training session for DFI-EP, LLC employees on the impacts of the metal finishing wastewater on the sewer system. This training was conducted by Pretreatment staff on October 25, 2016. The NBC will continue to work with DFI-EP, LLC to completely resolve this administrative matter.

Bucklin Point District

- AO #BP-01-16 was issued against Memorial Hospital of Rhode Island (MHRI), on September 22, 2016. The AO cited this company for failure to immediately notify the NBC of a diesel fuel spill that occurred on June 11, 2016. This was in violation of its Wastewater Discharge Permit, Spill and Slug Prevetion Control Plan, and the NBC Rules and Regulations. The AO stated that MHRI must immediately comply with its approved Spill and Slug Prevention Control Plan and pay an Administrative Penalty of $2,500.00. MHRI complied with the AO and submitted payment to the NBC Environmental Enforcement Fund on October 4, 2016. This matter is now closed.

In addition to AO # BP-01-16 and AO # FP-01-15, the Pretreatment Section prepared information for an AO Prep Form in late 2016 for Putnam Holdings, Inc. This AO Prep Form requests that an AO be issued for not submitting required self-monitoring compliance reports and non-payment of fees. The AO will be issued in early 2017.

Update of Past Enforcement Actions

- AO # BP-01-15 was issued against Ecological Fibers, Inc., a paper coating and printing company, on October 6, 2015. The AO cited this company for thirty (30) exceedances of the daily maximum concentration discharge limitation for zinc since August 1, 2013. The AO stated that Ecological Fibers must submit a proposal to the NBC to reduce zinc concentrations in order to comply with the NBC daily maximum concentration discharge limitations for zinc, implement said plan after review and approval by the Pretreatment Section, and pay an Administrative Penalty of $22,000.00. On December 9, 2015, NBC held a status conference with representatives from Ecological Fibers. Steps to mitigate the consistent zinc exceedances were discussed during the meeting. Throughout 2016, Ecological Fibers, Inc. addressed house keeping issues at the facility and investigated additional pretreatment technologies. During 2016 the company experienced twenty-two (22) zinc violations. The company submitted monthly reports on the status of the various treatment projects and the steps that were taken to address these violations. As of September 2016 the company has not had any additional violations of the zinc discharge limitation. The NBC Legal Section and Ecological Fibers, Inc. continued to negotiate a Consent Order (CO) throughout 2016. The CO was executed on February 8, 2017. The company paid an Administrative Penalty of $10,000.

2016 Civil Suits

During 2016 the NBC did not issue any civil suits against a permitted company for violations of the Rules and Regulations and the terms of its Wastewater Discharge Permit. Below is an update of the civil action (CA) that was issued in 2012.

- CA #12-2600 was issued against Providence Specialty Products, Inc. (Providence Specialty), a SIU conducting cheese manufacturing operations. Providence Specialty accrued an outstanding balance due to non-payment of permit fees and BOD/TSS surcharges. Letters from the Legal Section were issued to the company on February 15, 2012 and March 20, 2012. The company did not respond to these letters and a complaint was filed with the Superior Court on April 17, 2012 for the recovery of $87,873.73. The complaint was amended for the balance of $99,735.66. The company was served with the complaint on July 5, 2012. The parties met on September 13, 2012 to discuss the issues. During the discussion, Providence Specialty stated the BOD/TSS surcharge calculations that were performed by the NBC were not accurate because the volume of flow used for the calculations was too high. The company provided documentation to demonstrate that more water is used in the process and not discharged to the sewer. The documentation showed the flow credit that should be used in determining the surcharge should be 50% rather than the 25% used by NBC. At the end of the meeting the parties agreed that Providence Specialty had until January 25, 2013 to respond to the complaint. A site visit of the facility was also agreed on. The site visit was conducted on October 2, 2012. The purpose of the visit was to verify that the increased flow credit was warranted and to determine the most accurate way of monitoring the wastewater discharged from the facility. The company was

provided options to accurately measure wastewater flow from the facility. Both parties met again on December 13, 2012. At this meeting Providence Specialty outlined a proposal for payment of the outstanding balance which included BOD/TSS surcharges, permit and consumption fees. A CO was issued and signed by Providence Specialty and NBC on January 31, 2013. Providence Specialty agreed to pay $90,527.11 in monthly installments. During 2016, Providence Specialty continued to pay these installments. As of December 31, 2016, Providence Specialty has paid a total of $47,000.00.

Permit Suspensions

As stated in Article 8.14 of the NBC Rules and Regulations, the Executive Director may suspend the Wastewater Discharge Permit of any user who ceases operations for any period exceeding one month. The suspension does not act as a revocation of the permit, but rather as a temporary suspension of the users' rights under the permit while operations have ceased. During 2016, no Letters of Wastewater Discharge Permit Suspension were issued.

Supplemental Environmental Projects

Supplemental Environmental Projects (SEP) are additional requirements and/or extra activities that may be undertaken by a violator of environmental laws or regulations against whom enforcement action has been taken. In settlement negotiations, the violator or the regulating authority may propose that an environmental project be undertaken in consideration of a reduced penalty.

In no case should the cost of the project to the violator be less than the offset amount of the penalty. A SEP may only be considered for inclusion in a settlement if the total settlement agreement ensures future compliance through corrective measures, a substantial monetary payment is made in addition to the SEP and if an appropriate nexus is demonstrated between the violation and the environmental benefits to be derived from the SEP.

The EPA recognizes five categories of acceptable supplemental environmental projects. The first four categories: pollution prevention projects, pollution reduction projects, Environmental restoration projects and environmental auditing projects require that the Project demonstrates an appropriate nexus between the nature of the violation and the environmental benefits to be derived. For example, if the violator was cited for repeated pH reporting violations, the purchase and installation of digital or computerized pH monitoring and recording equipment would provide sufficient nexus between the violation and the anticipated benefit to be derived from use of the equipment. The last category, public awareness projects, is not subject to this strict nexus requirement, but must still be related to the type of violation which is the subject of the underlying violations. Pursuant to EPA regulation, general educational and environmental awareness projects are not acceptable as SEPs. In addition, SEPs are less appropriate for repeat offenders.

Environmental Enforcement Fund

During the 1989 Legislative Session, 89-S-786 was passed into law which established the Narragansett Bay Commission Environmental Enforcement Fund (EEF). This fund consists of sums recovered by administrative or civil enforcement actions brought under the authority of Rhode Island General Laws, Chapter 46-25 (the NBC enabling legislation) and may be used for the following:

- Emergency response activities such as site inspections, investigatory reports, collection, monitoring, and analysis of samples of wastewater, spill response, etc.
- Enforcement activities such as legal activities, to enforce the provisions of this chapter, etc.
- Additional activities such as professional and emergency response training, environmental research, public information and education, etc.
- Bay bond debt retirement (discretionary in the event that funds have not been committed for projects within a three year period following their deposit into the fund).

Save the Bay volunteers showing off their river cleanup water bottles received after cleaning green space in Providence.

Members from the Edgewood Waterfront Preservation Association collect litter from the shores of Edgewood Cove.

In 2016, two proposals were submitted to the NBC Board of Commissioners for review and were approved, awarding $13,500 collected from environmental violations to projects that enhance the Rhode Island environment and environmental education.

Since the late 1990s, the NBC has successfully sponsored a large Earth Day river cleanup event that focused on beautifying the Woonasquatucket River. In 2013, the NBC initiated a grant program, provided through the EEF, intended to expand the positive impact on multiple rivers throughout the NBC service area rather than focusing solely on the Woonasquatucket River. The NBC continued this grant program in 2016 and was able to assist numerous local organizations, cities and towns by providing 21 small grants that allowed the organizations to purchase the supplies necessary to organize cleanups and perform river restoration activities with the NBC service area. A complete list of the grant award recipients can be found in CHAPTER VII.

A summary of the grants that were awarded Environmental Enforcement Funds in 2016 are listed below in TABLE 33.

TABLE 33
2016 Approved Environmental Enforcement Fund Proposals

EEF#	Company	Project	Amount Awarded
16-001	NBC Earth Day Clean-Up Grant Program	Grant program designed to offer financial assistance in the form of small grants to qualifying organizations conducting Earth Day Clean-Up events within the NBC service district.	$11,000.00
16-002	The MET School - Leonard Walker Scholarship Fund	Contribution to the Leonard Walker Scholarship Fund to help school children in RI receive a better education at the MET School.	$2,500.00
Total Approved in 2016			**$13,500.00**

Enforcement Response Plan

In accordance with 40CFR§403.8(f)(5), the NBC developed and submitted an Enforcement Response Plan (ERP) to the DEM on February 1, 1993. The plan was officially approved by the DEM on January 12, 1995. The purpose of the plan is to clearly establish anticipated reactions of the agency to specific violations of the relevant environmental laws and regulations. The plan explains the enforcement tools and mechanisms available and employed by the NBC and the Pretreatment Program. The plan suggests timetables for the initiation of enforcement actions that would be followed as soon as practicable after NBC staff becomes aware of any non-complying event. These timetables serve two goals. The timetables avoid continued user non-compliance for extended periods of time by requiring quick enforcement response by the NBC. Secondly, the quick enforcement response guarantees that evidence and memories will not become stale by the time delay that can occur when initiating an enforcement action.

The NBC has revised the ERP to comply with DEM requirements imposed during the year 2000 DEM Pretreatment Compliance Inspection and the RIPDES permits issued by the DEM on December 31, 2001. The revised ERP was submitted to the DEM on August 28, 2002 in accordance with DEM requirements. The plan was approved by the DEM on September 26, 2003.

Publication of Firms in Significant Non-Compliance (SNC)

Federal regulation 40CFR§403.8(f)(2)(vii) requires the NBC to publish at least annually the names of all industrial users in Significant Non-Compliance (SNC) with pretreatment standards or other pretreatment requirements during the preceding 15 months. A list of industrial users found to be in SNC with pretreatment standards and/or administrative requirements for the period of October 1, 2015 through December 31, 2016 were published in an advertisement in the PROVIDENCE JOURNAL on February 23, 2017. A copy of this advertisement is provided in FIGURE 39, while the Confirmation of Publication is provided in FIGURE 40.

During 2006 the NBC Rules and Regulations were modified to incorporate the revised EPA definition of SNC, detailed in the EPA Pretreatment Streamlining Regulations. The NBC complied with Federal regulations to cite any industrial user as being in SNC for violating any of the following criteria:

(a) Chronic violations of wastewater discharge limitations, defined here as those in which 66% or more of all measurements taken in a six (6) month period exceed (by any magnitude) a numerical Pretreatment Standard of Requirement for the same pollutant parameter;

(b) Technical Review Criteria (TRC) violation, defined here as those in which 33% or more of all the measurements for each pollutant parameter taken during a six (6) month period equal or exceed the product of the numerical Pretreatment Standard or Requirement multiplied by the applicable TRC value. (TRC = 1.4 for BOD, TSS, fats, oil, and grease and 1.2 for all other pollutants except pH);

(c) Any other violation of a pretreatment effluent limit (daily maximum or long-term average) that the Commission determines has caused, either alone or in combination with other discharges, pass through or interference (including endangering the health of Commission personnel or the general public);

(d) Any discharge of a pollutant that has caused imminent endangerment to human health, welfare, or the environment, or causes the POTW to exercise its emergency authority to halt or prevent such discharge;

(e) Failure to meet, within 90 days after the scheduled date, a compliance milestone contained in a permit or enforcement order, for starting construction, completing construction, or attaining final compliance;

(f) Failure to provide within 30 days after the due date, required reports such as Baseline Monitoring Reports, 90-day reports, periodic reports, and compliance schedule milestone reports;

(g) Failure to accurately report non-compliance;

(h) Any violation or group of violations that the NBC determines will adversely affect the operation or implementation of the Pretreatment Program.

Based upon extensive user file reviews, the names of eleven firms were listed in the February 23, 2017, public notice in the Providence Journal. Of the eleven firms listed in SNC, six users are located in Field's Point and five are located in Bucklin Point users. There were two firms in SNC subject to EPA categorical standards. Both of these firms are classified as metal finishers. One is located in Field’s Point and the other is located in Bucklin Point. Three firms are classified as non-categorical significant industrial users. One is located in Field’s Point and the other two are located in Bucklin Point. The Field’s Point firm conducts cheese manufacturing operations. One of the Bucklin Point firms conducted textile manufacturing operations and is now out of business. The other Bucklin Point non-categorical significant industrial user conducts printing operations. Six of the

firms published are classified as non-significant industrial users. Two of these firms conduct zero discharge jewelry manufacturing operations. One firm conducted zero discharge stone cutting operations and has moved out of the district. One firm conducts plate making operations. One firm conducts screw manufacturing operations. The remaining firm conducts printing operations. Four of the non-significant industrial users are located in the Field's Point disctrict and two are located in the Bucklin Point district.

As noted there were eleven firms listed in SNC in 2016, a decrease from the thirteen firms listed in SNC in 2015. All but three of the eleven users listed in the February 23, 2017, SNC Public Notice, had achieved full compliance with the EPA and NBC Rules and Regulations for which they were published prior to the date of publication. All three of the firms that had not returned to full compliance, two zero discharge jewelry manufacturing facilities and a plate making facility, were published in SNC for failure to submit reports on time. The reports had still not been received as of the date of the Public Notice. Five of the firms, four of which are SIUs, were published in SNC for exceeding NBC discharge limitations. Administrative Orders were issued to two of these SIUs. One SIU was published in SNC for exceeding NBC discharge limitations and failure to submit a report on time. The remaining five firms were published in SNC for failure to submit reports on time, which are administrative violaitons. Additional information regarding the firms listed in SNC is provided in CHAPTERS I and IV. The cost to publish the public notice was billed to the firms listed as being in Significant Non-Compliance.

Publication of Firms in Perfect Compliance

In addition to publishing the annual SNC public notice, the NBC annually publishes the names of firms that achieved perfect compliance during the review period. In 2016, the NBC recognized seventeen SIUs for achieving perfect compliance with the terms of their permits and the NBC Rules and Regulations. These seventeen SIUs will be recognized at awards ceremony in April 2017. The 2016 Perfect Compliance advertisement can be seen in FIGURE 42. Additional information regarding the Environmental Merit Awards program can be found in CHAPTER VII.

FIGURE 40
2016 SIGNIFICANT NON-COMPLIANCE PUBLIC NOTICE
THE PROVIDENCE JOURNAL

The Narragansett Bay Commission

PUBLIC NOTICE

Firms in Significant Non-Compliance

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGULATION 40 C.F.R. 403.8(f) (2) (viii) and Article 10 of the Narragansett Bay Commission, Rules and Regulations require the NBC to publish annually the names of all industrial users in Significant Non-Compliance (SNC) with pretreatment standards and other pretreatment requirements during the preceding year. Companies deemed to be in Significant Non-Compliance are those industrial users who have violated any of the Significant Non-Compliance criteria listed, as defined by Article 2 of the NBC Rules and Regulations during the time period from October 1, 2015 through December 31, 2016. The parameters for which a company was not in compliance and/or the specific administrative deficiency are listed after the company name. The number(s) in parentheses correspond to the type of SNC criteria specified below. Some of the firms listed below may have been issued an Administrative Order in which administrative and/or civil penalties may have been assessed. Many of the companies listed have made significant progress toward correcting the violations and may now be in compliance.

Significant Non-Compliance Criteria:

(1) Chronic violations of wastewater discharge limits, defined here as those in which 66% or more of all of the measurements taken during a six-month period exceed (by any magnitude) a numerical Pretreatment Standard or Requirement for the same pollutant parameter;

(2) Technical Review Criteria (TRC) violations, defined here as those in which 33% or more of all the measurements for each pollutant parameter taken during a six-month period equal or exceed the product of a numerical Pretreatment Standard or Requirement multiplied by the applicable TRC value (TRC = 1.4 for BOD, TSS, fats, oil, and grease and 1.2 for all other pollutants except pH);

(3) Any other violation of a pretreatment effluent limit (daily maximum or long-term average) that the Commission determines has caused, alone or in combination with other discharges, interference or pass through (including endangering the health of Commission personnel or the general public);

(4) Any discharge of a pollutant that has caused imminent endangerment to human health, welfare or the environment or has resulted in the Commission's exercise of its emergency authority to halt or prevent such a discharge;

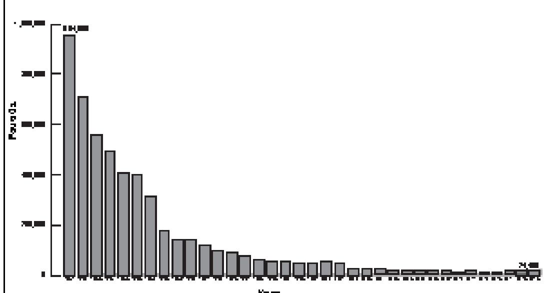
(5) Failure to meet, within 90 days after the scheduled date, a compliance schedule milestone contained in a Commission certification, permit or enforcement order, for starting construction, completing construction or attaining final compliance;

(6) Failure to provide, within 30 days after the due date, required reports such as baseline monitoring reports, 90-day compliance reports, self-monitoring compliance reports and reports on compliance with compliance schedules;

(7) Failure to accurately report noncompliance;

(8) Any other violation or group of violations which the Commission determines has adversely affected the operation or implementation of the Industrial Pretreatment Program.

Total Metals Influent to Field's Point WWTF, 1981-2016



THE NARRAGANSETT BAY COMMISSION IS COMMITTED TO PROTECTING THE STATE'S TWO LARGEST WASTEWATER TREATMENT FACILITIES AND NARRAGANSETT BAY FROM TOXIC DISCHARGES. This is accomplished by the issuance of discharge permits to commercial and industrial sewer users. These discharge permits specify the level of pollutants that can be discharged to a facility's wastewater and may require a firm to conduct wastewater monitoring to verify compliance with discharge limits, to implement a Spill Control Plan and/or Toxic Organic/Solvent Management Plan, and to install pretreatment equipment. Various reporting and record keeping requirements may also be written into discharge permits. The firms listed in this public notice violated one or more of the significant non-compliance criteria specified above. The Commission is required by the RI DEM and the US EPA to annually publish the names of all firms violating any of these criteria. Therefore, firms must be sure to comply with all the terms specified in their discharge permit to ensure that the name of their firm is not listed in this annual public notice. The NBC offers FREE technical assistance to firms located in the NBC service area through its non-regulatory Office of Environmental, Safety & Technical Assistance. For information on how the NBC Environmental, Safety & Technical Assistance Program can help your firm achieve and maintain compliance, contact the Environmental, Safety & Technical Assistance Program Staff at 461-8848/TDD 461-6549.

Most businesses located in the NBC district are to be commended for the fine job they have done treating their process discharges to remove toxic pollutants. In 1981, local industries discharged 934,099 pounds of heavy metals such as copper, nickel and zinc and 30,440 pounds of cyanide to the Field's Point Wastewater Treatment Facility. Since 1981, the total metals and cyanide loadings to the Field's Point facility have been reduced by 97.4% and 98.7% respectively. Similar toxic loading reductions have been observed at the NBC Bucklin Point facility.

Bucklin Point Service Area

Lincoln

Company Name	Violations Cited	Present Status
[illegible] Holdings, Inc.	Failure to submit reports on time (6)	Reports have not been received.

Pawtucket

Company Name	Violations Cited	Present Status
Ecological Fibers, Inc.	Zn (2)	Firm is now in compliance.
Road Warrior Sandblaster Coatings, LLC	Cu (2)	Firm is now in compliance.
[illegible] Manufacturing Company, Inc.	CN (2)	Firm is now in compliance.
MicroFibers, Inc.	Failure to submit reports on time (6)	Firm is out of business.

Field's Point Service Area

Johnston

Company Name	Violations Cited	Present Status
[illegible] Screw Company	O&G (2)	Firm is now in compliance.
KB Surfaces	Failure to submit report on time (6)	Report has been received.

North Providence

Company Name	Violations Cited	Present Status
[illegible], LLC	Cr (2), CN (2), Ni (2)	Firm is now in compliance.

Providence

Company Name	Violations Cited	Present Status
Providence Specialty Products	O&G (1, 2)	Firm is now in compliance.
	Failure to submit report on time (6)	Report has been received.
JC Gordon Co.	Failure to submit report on time (6)	Reports have not been received.
[illegible] Jewelry	Failure to submit report on time (6)	Report has not been received.

The Narragansett Bay Commission will continue to lead in wastewater treatment, environmental protection, and environmental education to ensure a cleaner Narragansett Bay for all to enjoy.

Vincent J. Mesolella, *Chairman* • Raymond J. Marshall, P.E., *Executive Director*
Narragansett Bay Commission • One Service Road • Providence, RI 02905 • 401-461-8848 • TDD 401-461-6549 • FAX 401-461-6540 • http://www.narrabay.com
Twitter: @narrabay • Facebook: www.facebook.com/narrabay • Instagram @narrabay
[illegible]

FIGURE 41
CONFIRMATION OF PUBLICATION OF SNC PUBLIC NOTICE

Wedding Cake House sale approved

PROVIDENCE

Agency sees takeover of vacant houses

CENTER

Garden City at a glance

Perfect Compliance

PUBLIC NOTICE

Firms in Significant Non-Compliance

DONATE YOUR CAR

Wheels For Wishes

Make-A-Wish Massachusetts and Rhode Island

STEPHEN J. DENNIS

FIGURE 42
2016 PERFECT COMPLIANCE ADVERTISEMENT
PROVIDENCE JOURNAL

TABLE 34
SUMMARY OF ENFORCEMENT ACTIONS THROUGH 12/31/16
FIELD'S POINT

NFORCEMENT ACTION# COMPANY NAME	AO ISSUE DATE	RESOLUTION	ORIGINAL ADMIN. PENALTIES ASSESSED	ADMIN. PENALTIES AWARDED OR AGREED TO	ADMIN. PENALTIES PAID	ADMIN. PENALTIES BALANCE	ENF.COSTS ASSESSED/ AWARDED/ AGREED TO	ENF. COSTS PAID	ENF. COSTS BALANCE	STIPULATED PENALTIES ASSESSED	STIPULATED PENALTIES PAID	STIPULATED PENALTIES BALANCE
NOV #1 F. RONCI CO.	01/31/1986	HEARING AWARDED $219,950.00 COURT REVERSED AWARD	N/A	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
NOV #2 ABATE & URSILLO COMPANY	03/20/1987	CONSENT ORDER 05/01/87 BANKRUPT	N/A	$23,000.00	$2,683.31	$20,316.69	$1,500.00	$1,500.00	$0.00	$750.00	$750.00	$0.00
NOV #3 ASTRO PLATING WORKS	05/13/1987	CONSENT ORDER 08/20/87	N/A	$70,000.00	$70,000.00	$0.00	$4,000.00	$4,000.00	$0.00	$19,500.00	$19,500.00	$0.00
NOV #4 A & J JEWELRY CO.	10/07/1987	CONSENT ORDER 11/13/87	N/A	$7,500.00	$7,500.00	$0.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00
NOV #5 RAU FASTENERS, INC.	10/12/1987	CONSENT ORDER 07/23/90	N/A	$50,000.00	$50,000.00	$0.00	$2,000.00	$2,000.00	$0.00	$117,500.00	$117,500.00	$0.00
NOV #6 H.M. PLATING CO.	12/10/1987	NOV RESCINDED	N/A	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
NOV #7 ANTONELLI PLATING CO.	12/07/1987	NOV RESCINDED	N/A	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
NOV #8 H.M. PLATING CO.	09/14/1988	CONSENT ORDER 01/13/89 BANKRUPT	N/A	$15,000.00	$3,000.00	$12,000.00	$2,000.00	$2,000.00	$0.00	$1,750.00	$1,750.00	$0.00
NOV #9 BIANCO PLATING CO.	10/04/1988	CONSENT ORDER 03/10/89 BANKRUPT	N/A	$23,000.00	$7,800.00	$15,200.00	$8,400.00	$8,400.00	$0.00	$500.00	$500.00	$0.00
NOV #10 PROCRAFT, INC.	02/16/1989	CONSENT ORDER 04/27/90	N/A	$1,500.00	$1,500.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
NOV #11 CONCORDE BUCKLE CO.	08/04/1989	CONSENT ORDER 03/20/90	N/A	$7,500.00	$7,500.00	$0.00	$1,000.00	$1,000.00	$0.00	$0.00	$0.00	$0.00

TABLE 34
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NOV #12 GALAXY GOLD, INC.	11/01/1989	CONSENT ORDER 04/27/90 PERMIT REVOKED 10/26/89	N/A	$6,300.00	$6,300.00	$0.00	$2,193.00	$2,193.00	$0.00	$0.00	$0.00	$0.00
NOV #13 SCIENTIFIC METAL FINISHING	11/01/1989	NOV RESCINDED	N/A	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
NOV #14 EASTLAND/ NU-WAY FOOD PRODUCTS	11/01/1989	CONSENT ORDER 03/29/90	N/A	$3,000.00	$3,000.00	$0.00	$12,254.00	$12,254.00	$0.00	$0.00	$0.00	$0.00
NOV #15 GOLD CROWN, INC.	02/15/1990	CONSENT ORDER 09/11/90	N/A	$10,000.00	$10,000.00	$0.00	$2,270.00	$2,270.00	$0.00	$0.00	$0.00	$0.00
NOV #16 SCIENTIFIC METAL FINISHING/S. MARCOS	12/22/1989	CONSENT ORDER 07/25/90 BANKRUPT	N/A	$12,500.00	$5,200.00	$7,300.00	$7,700.00	$2,500.00	$5,200.00	$1,500.00	$500.00	$1,000.00
NOV #17 SCIENTIFIC METAL FINISHING/ J. ROACH	12/22/1989	TERMS INCORPORATED INTO THE ABOVE CONSENT ORDER		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
NOV #18 ELECTRONIC PRECISION	02/15/1990	NOV RESCINDED MERGED W/ NOV #27	N/A	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
NOV #19 AMICARELLI & EASTMAN	05/15/1990	NOV RESCINDED	N/A	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
NOV #20 ARC ENTERPRISE	05/15/1990	HEARING ORDER 08/29/90 DEBTOR INSOLVENT	N/A	$6,000.00	$0.00	$6,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
NOV #21 ELECTROLIZING	06/07/1990	CONSENT ORDER 01/16/91	$68,000.00	$8,000.00	$8,000.00	$0.00	$4,000.00	$4,000.00	$0.00	$0.00	$0.00	$0.00
NOV #22 RHODE ISLAND CLEANERS	06/11/1990	HEARING ORDER 10/02/90 CONSENT ORDER 07/14/92	$15,000.00	$15,000.00 w/ $4,000.00 SUSPENDED	$11,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

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NOV #23 QUALITEX, INC.	07/05/1990	CONSENT ORDER 10/19/90	N/A	$25,000.00	$25,000.00	$0.00	$5,193.92	$5,193.92	$0.00	$5,000.00	$5,000.00	$0.00
NOV #24 PROVIDENCE HOUSING AUTHORITY	08/23/1990	CONSENT ORDER 11/01/90	$4,000.00	$0.00	$0.00	$0.00	$7,614.88	$7,614.88	$0.00	$0.00	$0.00	$0.00
NOV #25 JOHNSTON DRESSED BEEF & VEAL CO.	08/29/1990	HEARING ORDER 11/14/90	N/A	$23,000.00	$23,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
NOV #26 J.V. PLATING CO.	09/04/1990	CONSENT ORDER 04/09/91 BANKRUPT	$22,000.00	$3,000.00	$1,750.00	$1,250.00	$2,260.00	$1,130.00	$1,130.00	$750.00	$0.00	$750.00
NOV #27 ELECTRONIC PRECISION CIRCUITRY	09/24/1990	CONSENT ORDER 01/07/91	N/A	$12,300.00	$12,300.00	$0.00	$7,700.00	$7,700.00	$0.00	$0.00	$0.00	$0.00
NOV #28 WALLACE COMPANY	10/26/1990	BANKRUPT	N/A	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
NOV #29 APAC TOOL, INC.	10/26/1990	CONSENT ORDER 04/23/91	$8,000.00	$2,498.00	$2,498.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
NOV #30 D'AMBRA CONSTRUCTION	12/19/1990	CONSENT ORDER 06/11/92	N/A	$2,000.00	$2,000.00	$0.00	$7,000.00	$7,000.00	$0.00	$0.00	$0.00	$0.00
NOV #31 NEW ENGLAND TELEPHONE & TELEGRAPH CO.	01/10/1991	CONSENT ORDER 06/13/91	$9,910.00	$8,000.00	$8,000.00	$0.00	$1,910.00	$1,910.00	$0.00	$0.00	$0.00	$0.00
NOV #32 ALLENS MANUFACTURIN G CO.	01/10/1991	CONSENT ORDER 09/06/91	$54,000.00	$2,870.00	$2,870.00	$0.00	$2,810.00	$2,810.00	$0.00	$0.00	$0.00	$0.00
NOV #33 PROVIDENCE COLLEGE	02/07/1991	MERGED WITH NOV #34 CONSENT ORDER 07/15/91	$7,200.00	$12,000.00	$12,000.00	$0.00	$2,320.00	$2,320.00	$0.00	$0.00	$0.00	$0.00

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NOV #34 PROVIDENCE COLLEGE	02/15/1991	MERGED WITH NOV #33 SEE ABOVE	N/A	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
NOV #35 VANITY JEWELRY	03/13/1991	CONSENT ORDER 05/10/91	$1,250.00	$1,250.00	$1,250.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #1 QUALITY STAMPING	06/25/1991	CONSENT JUDGMENT 04/26/96	$25,000.00	$5,000.00	$5,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #2 JOHN OLSON & SONS	07/03/1991	CONSENT ORDER 06/09/92	$22,000.00	$4,500.00	$4,500.00	$0.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00
AO #3 D & D PLATING	08/26/1991	CONSENT ORDER 02/11/92	$9,250.00	$3,000.00	$3,000.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #4 DON-LIN JEWELRY CO.	08/26/1991	CONSENT ORDER 01/13/92	$4,218.00	$2,500.00	$2,500.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #5 FEDERAL PRODUCTS	08/26/1991	CONSENT ORDER 12/26/91	$4,250.00	$2,500.00	$2,500.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #6 SMITH JEWELRY SERVICE CO.	08/26/1991	IMMEDIATE COMPLIANCE ORDER	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #7 F. RONCI (SMITH ST.)	10/10/1991	BANKRUPT	$171,850.00	$170,850.00	$0.00	$170,850.00	$1,000.00	$0.00	$1,000.00	$0.00	$0.00	$0.00
AO #8 F. RONCI (ATLANTIC BLVD.)	10/10/1991	BANKRUPT	$52,200.00	$51,700.00	$0.00	$51,700.00	$500.00	$0.00	$500.00	$0.00	$0.00	$0.00
AO #9 CH SPRAGUE	10/10/1991	CONSENT ORDER 05/06/92	$15,000.00	$4,000.00	$4,000.00	$0.00	$2,000.00	$2,000.00	$0.00	$0.00	$0.00	$0.00

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AO #10 QUALITY PLATING	12/04/1991	DEBTOR INSOLVENT	$40,135.00	$39,650.00	$0.00	$39,650.00	$485.00	$0.00	$485.00	$0.00	$0.00	$0.00
AO #11 GENERAL ELECTRIC	10/28/1991	COMPLIED WITH ORDER	$6,885.00	$6,885.00	$6,885.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #12 ALLENS MFG. CO.	12/04/1991	PERMIT FEES PAID FINE WAIVED	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #13 ELECTROBRITE COATING CO.	12/14/1991	PERMIT FEES PAID FINE WAIVED	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #14 MERCURY POLISHING & PLATING	12/14/1991	PERMIT FEES PAID FINE WAIVED	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #15 GABRIELE'S, IND.	12/14/1991	COMPLIED WITH ORDER	$250.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #16 DUNC'S PLATING	12/14/1991	COMPLIED WITH ORDER	$250.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #17 SAMSON MFG., LTD.	12/14/1991	AO RESCINDED	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #18 STARBRITE PLATING	12/14/1991	COMPLIED WITH ORDER	$250.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #19 ASTRO PLATING WORKS	12/14/1991	COMPLIED WITH ORDER	$250.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #20 QUALITY PLATING CO.	12/14/1991	AO RESCINDED	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

TABLE 34
SUMMARY OF ENFORCEMENT ACTIONS THROUGH 12/31/16
FIELD'S POINT

NFORCEMENT ACTION# COMPANY NAME	AO ISSUE DATE	RESOLUTION	ORIGINAL ADMIN. PENALTIES ASSESSED	ADMIN. PENALTIES AWARDED OR AGREED TO	ADMIN. PENALTIES PAID	ADMIN. PENALTIES BALANCE	ENF.COSTS ASSESSED/ AWARDED/ AGREED TO	ENF. COSTS PAID	ENF. COSTS BALANCE	STIPULATED PENALTIES ASSESSED	STIPULATED PENALTIES PAID	STIPULATED PENALTIES BALANCE
AO #21 CLAYTON CO.	01/22/1992	CONSENT ORDER 12/07/92	$9,882.00	$6,000.00	$6,000.00	$0.00	$382.00	$382.00	$0.00	$0.00	$0.00	$0.00
AO #22 JEWELS BY PATRICIA	01/22/1992	CONSENT ORDER 05/18/92	$10,500.00	$2,500.00	$2,500.00	$0.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00
AO #23 J.V. PLATING	01/22/1992	BANKRUPT	$250.00	$250.00	$0.00	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #24 QUAKER PLATING	01/23/1992	CONSENT ORDER 06/19/92	$14,600.00	$5,900.00	$5,900.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #25 GOLD CROWN	01/23/1992	CONSENT ORDER 07/08/93	$19,000.00	$9,000.00	$9,000.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #27 QUEBECOR PRINTING	01/07/1992	CONSENT ORDER 06/29/93	$22,250.00	$10,000.00	$10,000.00	$0.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00
AO # FP-01-92 ANTONELLI PLATING	04/03/1992	MERGED WITH #FP-02-92 CONSENT ORDER 07/23/92	$250.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # FP-02-92 ANTONELLI CASTING	04/03/1992	MERGED WITH #FP-01-92 SEE ABOVE	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # FP-03-92 GOLD CROWN	05/26/1992	IMMEDIATE COMPLIANCE ORDER	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # FP-04-92 ALLENS MFG.	06/04/1992	BANKRUPT	$11,250.00	$11,250.00	$0.00	$11,250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # FP-05-92 GENERAL ELECTRIC	09/01/1992	CONSENT ORDER 08/10/93	$9,500.00	$7,500.00	$7,500.00	$0.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00

TABLE 34
SUMMARY OF ENFORCEMENT ACTIONS THROUGH 12/31/16
FIELD'S POINT

NFORCEMENT ACTION# COMPANY NAME	AO ISSUE DATE	RESOLUTION	ORIGINAL ADMIN. PENALTIES ASSESSED	ADMIN. PENALTIES AWARDED OR AGREED TO	ADMIN. PENALTIES PAID	ADMIN. PENALTIES BALANCE	ENF.COSTS ASSESSED/ AWARDED/ AGREED TO	ENF. COSTS PAID	ENF. COSTS BALANCE	STIPULATED PENALTIES ASSESSED	STIPULATED PENALTIES PAID	STIPULATED PENALTIES BALANCE
AO # FP-06-92 DUNC'S PLATING	11/12/1992	PERMIT FEES PAID FINE WAIVED	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # FP-07-92 BROAD STREET CAR WASH	11/12/1992	CONSENT ORDER 01/06/93	$250.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # FP-08-92 CAFFE PAZZO	12/16/1992	CONSENT ORDER 07/07/93 BUSINESS CHANGED OWNERSHIP	$2,500.00	$500.00	$100.00	$400.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # FP-09-92 AIR CLEANING CONCEPTS	12/23/1992	COMPLIANCE ORDER	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-01-93 FEDERATED METALS	03/29/1993	CONSENT ORDER 06/17/93	$12,250.00	$1,500.00	$1,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-02-93 EASTERN COLOR & CHEMICAL	03/29/1993	CONSENT ORDER 07/08/93	$23,000.00	$10,000.00	$10,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-03-93 B B GREENBERG	03/29/1993	BANKRUPT	$7,500.00	$7,500.00	$0.00	$7,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-04-93 ROCCHIO & SONS	05/05/1993	CONSENT ORDER 05/19/97	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-05-93 RI DEPT OF TRANS.	05/05/1993	SAME CASE AS ABOVE	SAME CASE AS ABOVE	SAME CASE AS ABOVE	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # FP-06-93 GFB/ADMIRAL NORGETOWN	05/18/1993	OUT OF BUSINESS	$1,000.00	$1,000.00	$0.00	$1,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # FP-07-93 NEW RIVERS RESTAURANT	07/14/1993	CONSENT ORDER 12/03/93	$1,500.00	$200.00	$200	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

TABLE 34
SUMMARY OF ENFORCEMENT ACTIONS THROUGH 12/31/16
FIELD'S POINT

NFORCEMENT ACTION# COMPANY NAME	AO ISSUE DATE	RESOLUTION	ORIGINAL ADMIN. PENALTIES ASSESSED	ADMIN. PENALTIES AWARDED OR AGREED TO	ADMIN. PENALTIES PAID	ADMIN. PENALTIES BALANCE	ENF.COSTS ASSESSED/ AWARDED/ AGREED TO	ENF. COSTS PAID	ENF. COSTS BALANCE	STIPULATED PENALTIES ASSESSED	STIPULATED PENALTIES PAID	STIPULATED PENALTIES BALANCE
AO #FP-08-93 MERCURY POLISHING & PLATING CO.	07/22/1993	BANKRUPT/ TERMINATION OF PERMIT	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # FP-09-93 RAU FASTENER	07/23/1993	CONSENT ORDER 05/06/94	$25,000.00	$7,500.00	$7,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # FP-10-93 ALLENS MFG. CO.	07/26/1993	BANKRUPT	$11,000.00	$11,000.00	$0.00	$11,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # FP-11-93 MERIT PLATING	08/06/1993	CONSENT ORDER 04/28/94 BUSINESS CLOSED	$25,000.00	$5,000.00	$0.00	$5,000.00	$500.00	$0.00	$500.00	$0.00	$0.00	$0.00
AO #FP-12-93 R.E.STURDY COMPANY	12/08/1993	COMPLIED WITH ORDER	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-13-93 PROVIDENCE ELECTRO-PLATING	12/30/1993	CONSENT ORDER 10/17/95	$20,000.00	$1,000.00 $5,000.00 (SEP)	$1,000.00 $5,000.00 (SEP)	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #FP-14-93 FBF, INCORPORATED	12/30/93 AMENDED 09/13/95	CONSENT ORDER 10/31/95 BUSINESS CLOSED	$31,000.00	$5,000.00	$0.00	$5,000.00	$250.00	$0.00	$250.00	$0.00	$0.00	$0.00
AO #FP-15-93 GEMCRAFT	12/30/1993	CONSENT ORDER 07/21/94	$16,000.00	SEP ($11,000)	SEP($11,000)	$0.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00
AO #FP-01-94 JOHNSTON DRESSED BEEF	04/08/1994	COMPLIED WITH ORDER	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-02-94 QUAKER PLATING	04/19/1994	CONSENT ORDER 06/06/94	$13,000.00	$3,000.00	$3,000.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #FP-03-94 YEA, YEA INC./SGUMBATO & SONS	4/19/94 AMENDED 11/20/95	CONSENT ORDER 09/23/96	$10,000.00	$5,000.00	$5,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

TABLE 34
SUMMARY OF ENFORCEMENT ACTIONS THROUGH 12/31/16
FIELD'S POINT

NFORCEMENT ACTION# COMPANY NAME	AO ISSUE DATE	RESOLUTION	ORIGINAL ADMIN. PENALTIES ASSESSED	ADMIN. PENALTIES AWARDED OR AGREED TO	ADMIN. PENALTIES PAID	ADMIN. PENALTIES BALANCE	ENF.COSTS ASSESSED/ AWARDED/ AGREED TO	ENF. COSTS PAID	ENF. COSTS BALANCE	STIPULATED PENALTIES ASSESSED	STIPULATED PENALTIES PAID	STIPULATED PENALTIES BALANCE
AO #FP-04-94 SHOOTER'S AT INDIA POINT	04/22/1994	CONSENT ORDER 10/12/94	$2,500.00	$2,500.00	$2,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-05-94 EVANS PLATING	06/24/1994	CONSENT ORDER 08/03/95	$29,000.00	$2,500 $6,000.00 (SEP)	$2,500.00 $6,000.00 (SEP)	$0.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00
AO #FP-06-94 RHODE ISLAND PUBLIC TRANSIT AUTHORITY	07/13/1994	COMPLIED WITH ORDER	$11,000.00 CONDITION ON NON-COMPLIANCE	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-07-94 T & J CONTAINER	07/20/1994	CONSENT ORDER 09/27/94	$4,000.00	$1,000.00	$1,000.00	$0.00	$152.94	$152.94	$0.00	$0.00	$0.00	$0.00
AO #FP-08-94 COLORLAB, LTD.	08/25/1994	CONSENT ORDER 11/09/94	$5,000.00	$500.00	$500.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #FP-09-94 PDQ PHOTO	08/25/1994	CONSENT ORDER 11/09/94	$5,000.00	$500.00	$500.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #FP-11-94 IDEAL PLATING	11/02/1994	CONSENT ORDER 08/07/95	$15,000.00	$2,500.00 $2,500.00 (SEP)	$2,500.00 $2,500.00 (SEP)	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #FP-12-94 BLUE GROTTO RESTAURANT	10/07/1994	CONSENT ORDER 05/30/95 BANKRUPT	$5,000.00	$2,000.00	$700.01	$1,299.99	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-13-94 GOLDEN DRAGON RESTAURANT	10/07/1994	CONSENT ORDER 02/02/95	$5,000.00	$1,000.00	$1,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-14-94 T. SARDELLI & SONS	10/07/1994	CONSENT ORDER 01/03/95	$15,000.00	$5,000.00	$5,000.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #FP-15-94 LINCOLN PARK	10/27/1994	SETTLEMENT	$5,000.00	$5,000.00	$5,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

TABLE 34
SUMMARY OF ENFORCEMENT ACTIONS THROUGH 12/31/16
FIELD'S POINT

NFORCEMENT ACTION# COMPANY NAME	AO ISSUE DATE	RESOLUTION	ORIGINAL ADMIN. PENALTIES ASSESSED	ADMIN. PENALTIES AWARDED OR AGREED TO	ADMIN. PENALTIES PAID	ADMIN. PENALTIES BALANCE	ENF.COSTS ASSESSED/ AWARDED/ AGREED TO	ENF. COSTS PAID	ENF. COSTS BALANCE	STIPULATED PENALTIES ASSESSED	STIPULATED PENALTIES PAID	STIPULATED PENALTIES BALANCE
AO #FP-16-94 PASTA ETC	11/07/1994	BUSINESS CLOSED	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-17-94 A.A. WRECKING	11/18/1994	SETTLEMENT	$10,000.00	$500.00	$500.00	$0.00	$5,997.44	$5,997.44	$0.00	$0.00	$0.00	$0.00
AO #FP-01-95 EAGLE PLATING CO, INC	05/30/1995	CONSENT ORDER 09/03/96	$50,000.00	$7,500.00	$7,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-02-95 RUMSTICK DINNER	06/08/1995	AO RESCINDED 10/18/95 BUSINESS CLOSED	$5,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-03-95 D'AGOSTINO'S AUTO SALVAGE, INC	07/10/1995	CONSENT ORDER 11/27/95	$11,000.00	$2,750.00	$2,750.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #FP-04-95 CENTURY PLATING INTERNATIONAL INC	07/10/1995	CONSENT ORDER 08/30/95	$33,000.00	$7,500.00	$7,500.00	$0.00	$500.00	$500.00	$0.00	$200.00	$200.00	$0.00
AO #FP-05-95 CARABELLA'S RESTAURANT	09/14/1995	AO RESCINDED	$5,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-06-95 KELLY'S CAR WASH	10/04/1995	CONSENT ORDER 02/29/96	$5,000.00	$2,500.00	$2,500.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #FP-07-95 FINISHING CONCEPTS, INC	10/05/1995	CONSENT ORDER 11/27/95	$20,000.00	$5,000.00	$5,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-08-95 CRC, CORP	11/21/1995	CONSENT ORDER 04/01/96	$1,000.00	PUBLIC AWARENESS AD $519.70	$519.70	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-09-95 THAILAND RESTAURANT	10/10/1995	CONSENT ORDER 11/20/96	$5,000.00	$200.00	$200.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

TABLE 34
SUMMARY OF ENFORCEMENT ACTIONS THROUGH 12/31/16
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AO #FP-10-95 RAU FASTENERS, LLC	12/28/1995	CONSENT ORDER 02/20/96	$13,000.00	$9,900.00	$9,900.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-01-96 OPTI FINISHING TECHNOLOGIES	04/09/1996 AMENDED 06/13/1996	PERMIT REVOKED	$18,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-02-96 RIBCO MFG. INC	04/09/1996	CONSENT ORDER 05/31/96	$10,000.00	$10,000.00	$10,000.00	$0.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00
AO #FP-03-96 DUNC'S PLATING CO.	04/25/1996	CONSENT ORDER 06/24/96	$5,000.00	$1,200.00	$1,200.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-04-96 NORTH PROVIDENCE MEDICAL SERVICES, INC.	07/02/1996	CONSENT ORDER 09/18/96	$0.00 COMPLIANCE ORDER	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-05-96 PRECISION INDUSTRIES	09/04/1996	CONSENT ORDER 11/20/96	$7,000.00	$1,500.00	$1,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-06-96 A&F PLATING CO., INC.	09/25/1996	MERGED WITH # FP-08-96	$25,000.00	MERGED WITH FP-08-96	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-07-96 REGENCY PLAZA ASSOCIATES	09/25/1996	CONSENT ORDER 01/13/97	$10,000.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-08-96 A&F PLATING CO., INC.	12/19/1996	PROSECTUED CRIMINALLY	$160,000.00	$15,000.00	$15,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-01-97 FOTO FINISH	06/12/1997	PERMIT FEES PAID CONSENT JUDGMENT 10/15/97 BUSINESS CLOSED	$5,000.00	$1,000.00	$751.06	$248.94	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-02-97 BEAUCRAFT, INC.	11/20/1997	CONSENT ORDER 01/15/98	$14,000.00	$5,750.00	$5,750.00	$0.00	$250.00	$250.00	$0.00	$400.00	$400.00	$0.00

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AO #FP-03-97 QUAKER PLATING COMPANY, INC.	12/30/1997	CONSENT ORDER 10/14/99	$52,000.00	$26,500.00	$26,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-01-98 HAB TOOL, INC.	02/24/1998	CONSENT ORDER 05/21/98	$10,000.00	$2,500.00	$2,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-02-98 AD-TECH, INC.	03/17/1998	HEARING HELD APPEAL PENDING	$40,500.00	$75,000.00 AWARDED AT HEARING	$0.00	$75,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-03-98 ALLENS MFG. CO., INC.	03/25/1998	RESOLUTION THRU BANKRUPTCY	$23,000.00	23,000.00	$23,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-04-98 DIMEO CONTRUCTION	06/18/1998	CONSENT ORDER 12/16/98	$1,500.00	$500.00 PUBLIC NOTICE ($459.60)	$959.60	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-05-98 RAWCLIFF CORPORATION	12/10/1998	CONSENT ORDER 03/30/99	$2,500.00	PUBLIC NOTICE ($597.75)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-06-98 RENCLIF, INC.	12/29/1998	CONSENT ORDER 03/18/99	$5,000.00	$1,000.00	$1,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-01-99 HAMILTON TOOL, INC.	03/02/1999	CONSENT ORDER 04/06/00 PERMIT FEES PAID	$5,000.00	$2,500.00	$2,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-01-00 CROWN PLATING, INC.	06/20/2000	SUPERIOR COURT STIPULATION FOR PAYMENT OF $12,000 FOR PERMIT FEES FINE WAIVED	$6,250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-02-00 ULTRA METAL FINISHING, INC.	12/28/2000	INCOPORATED INTO AO#FP-02-01 BANKRUPT	$22,000.00	$22,0000	$0.00	$22,000	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-03-00 EASTERN WIRE PRODUCTS CORP.	12/28/2000	CONSENT ORDER 10/30/01	$105,000.00	$10,000.00	$9,150.00 (per accelerated payment plan)	$0.00	$2,000.00	$1,925.00 (per accelerated payment plan)	$0.00	$0.00	$0.00	$0.00

TABLE 34
SUMMARY OF ENFORCEMENT ACTIONS THROUGH 12/31/16
FIELD'S POINT

NFORCEMENT ACTION# COMPANY NAME	AO ISSUE DATE	RESOLUTION	ORIGINAL ADMIN. PENALTIES ASSESSED	ADMIN. PENALTIES AWARDED OR AGREED TO	ADMIN. PENALTIES PAID	ADMIN. PENALTIES BALANCE	ENF.COSTS ASSESSED/ AWARDED/ AGREED TO	ENF. COSTS PAID	ENF. COSTS BALANCE	STIPULATED PENALTIES ASSESSED	STIPULATED PENALTIES PAID	STIPULATED PENALTIES BALANCE
AO#FP-01-01 MICHAEL MARSOCCI	10/31/2001	CONSENT ORDER 05/02/02	$5,000.00	$750.00	$750.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO#FP-02-01 ULTRA METAL FINISHING CO., INC.	12/27/2001	PERMIT REVOKED BUSINESS CLOSED BANKRUPT	$5,000.00	$5,000	$0.00	$5,000	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO#FP-01-02 RICHARD FULLER	02/05/2002	CONSENT ORDER 05/16/02	$5,000.00	$750.00	$750.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO#FP-02-02 D&L SALES	04/11/2002	CONSENT ORDER 02/25/03	$10,000.00	$2,500.00	$2,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO#FP-03-02 RI CESSPOOL CLEANERS, INC.	05/14/2002	CONSENT ORDER 06/17/02	$5,000.00	$1,250.00	$1,250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO#FP-04-02 C&J JEWELRY COMPANY, INC.	10/17/2002	CONSENT ORDER 12/11/02	$10,000.00	$5,000.00	$5,000.00	$0.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00
AO#FP-05-02 TOWN OF JOHNSTON	10/24/2002	AO SUSPENDED FOR COMPLIANCE	$25,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-01-03 TOWN OF JOHNSTON	09/10/2003	AO SUSPENDED FOR COMPLIANCE	$10,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-02-03 VICTORY FINISHING TECHNOLOGIES	09/10/2003	CONSENT ORDER 6/8/05	$55,000.00	$5000.00	$5000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-03-03 NEW ENGLAND INDUSTRIES	09/10/2003	CONSENT ORDER 3/9/04	$35,000.00	$1,500.00	$1,500.00	$0.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00
AO #FP-01-04 ELMHURST EXTENDED CARE	3/5/2004	CONSE4NT ORDER 10/27/04	$20,000.00	$7,500.00	$7,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

TABLE 34
SUMMARY OF ENFORCEMENT ACTIONS THROUGH 12/31/16
FIELD'S POINT

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AO #FP-02-04 ROGER WILLIAMS MEDICAL CENTER	03/05/2004	CONSENT ORDER 10/27/04	$30,000.00	$12,500.00	$12,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-01-05 WAL-MART STORES, INC.	10/17/2005	SETTLEMENT AGREEMENT 09/18/06 $40,000 CONTRIBUTION MADE FOR MAINTENANCE AND RIVER CLEANUPS	$61,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-01-07 PHILIP McKENDALL D/B/A LA PRIMA CAFFE	09/05/2007	CONSENT ORDER 11/19/07	$7,500	$2,500	$2,500	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-01-08 JRB ASSOCIATES INC.	08/25/08	CONSENT ORDER 4/15/09	$67,000	$24,000.00	$24,000	$0.00	$0.00	$0.00	$0.00	$575.00	$575.00	$0.00
AO #FP-01-09 AO #FP-02-09 MAZEY'S RESTAURANTS	10/8/2009	SETTLEMENT VIA SUPERIOR COURT STIPULATION FOR PAYMENT OF $640 10/24/13	$18,500	$640.00	$640.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
CIVIL ACTION #12-2600 PROVIDENCE SPECIALTY PRODUCTS, INC.	4/17/2012	CONSENT ORDER 1/31/13	$127,018.60	$90,527.11	$34,000	$56,527.11	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #FP-01-15 DFI-EP, LLC	1/14/16	CONSENT ORDER 11/10/16	$23,500	$8,000	$4,000	$4,000	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

TABLE 34
SUMMARY OF ENFORCEMENT ACTIONS THROUGH 12/31/16
BUCKLIN POINT

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BVDC NOV/ORDER LYNCH PAINT	JAN-87	BANKRUPT	$5,000.00	$1,000.00	$0.00	$1,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
BVDC NOV/ORDER LIBERTY PLATING	12/04/1987	CONSENT AGREEMENT 01/29/88	$85,500.00	$18,000.00 ($85,500.00 W/ $67,500.00 SUSPENDED)	$18,000.00	$0.00	$266.35	$266.35	$0.00	$0.00	$0.00	$0.00
BVDC NOV/ORDER #1 COLFAX, INC.	06/10/1988	SETTLEMENT AGREEMENT 09/08/88	$324,000.00	$60,000.00	$60,000.00	$0.00	$57,793.10	$57,793.10	$0.00	$0.00	$0.00	$0.00
BVDC NOV/ORDER TANYA CREATIONS	02/03/1989	CONSENT AGREEMENT 03/07/89	$54,000.00	$24,000.00 ($54,000 W/ $30,000 SUSPENDED)	$24,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
BVDC CHEMART COMPANY	04/17/1989	CONSENT AGREEMENT 09/29/89	$20,000.00	$5,000.00 ($10,000.00 w/ $5,000.00 SUSPENDED)	$5,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
BVDC NOV/ORDER NULCO MFG CORP	08/21/1989	CONSENT ORDER 05/01/90	$126,000.00	$21,000.00 ($42,000.00 W/ $21,000.00 SUSPENDED)	$21,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
BVDC NOV/ORDER #2 COLFAX, INC.	03/16/1990	SETTLEMENT AGREEMENT 07/11/90	$125,000.00	$12,500.00 ($20,000.00 W/ $7,500 SUSPENDED)	$12,500.00	$0.00	$10,117.98	$10,117.98	$0.00	2,000.00	$2,000.00	$0.00
BVDC NOV/ORDER NEWMAN CROSBY	04/10/1990	CONSENT ORDER 08/20/90	$10,500.00	$6,000.00 ($10,500.00 W/ $4,500.00 DEFERRED)	$6,000.00	$0.00	$4,403.26	$4,403.26	$0.00	$0.00	$0.00	$0.00
BVDC NOV/ORDER #3 COLFAX, INC.	07/06/1990	SETTLEMENT AGREEMENT 09/25/90	$25,000.00	$5,000.00	$5,000.00	$0.00	$6,562.15	$6,562.15	$0.00	$0.00	$0.00	$0.00
BVDC NOV/ORDER #4 COLFAX, INC.	08/08/1990	SETTLEMENT AGREEMENT 10/16/90	$380,000.00	$13,000.00	$13,000.00	$0.00	$42,056.29	$42,056.29	$0.00	$0.00	$0.00	$0.00
BVDC NOV/ORDER #5 COLFAX, INC.	12/13/1990	SETTLEMENT AGREEMENT 02/26/91	$20,000.00	$0.00	$0.00	$0.00	$2,867.65	$2,867.65	$0.00	$0.00	$0.00	$0.00
BVDC NOV/ORDER MICROFIBRES	07/31/1991	COMPLIED WITH CONDITIONAL ORDER	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

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SUMMARY OF ENFORCEMENT ACTIONS THROUGH 12/31/16
BUCKLIN POINT

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BVDC NOV VITRUS, INC.	09/17/1991	SETTLEMENT AGREEMENT 10/2/91	$0.00	$0.00	$0.00	$0.00	$1,025.54	$1,025.54	$0.00	$0.00	$0.00	$0.00
A0 #BP-01-92 DORETTE, INC.	04/22/1992	PERMIT FEES PAID FINE WAIVED	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-02-92 CELTIC PUB	04/22/1992	PERMIT FEES PAID FINE WAIVED	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-03-92 PIZZA PALACE	04/22/1992	BUSINESS CLOSED FINE WAIVED	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # BP-04-92 BILL'S RESTAURANT	04/22/1992	PERMIT FEES PAID FINE WAIVED	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-05-92 CHRISTINE'S OF CUMBERLAND	04/22/1992	PERMIT FEES PAID FINE WAIVED	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-06-92 VISTAWALL, INC.	04/22/1992	COMPLIED WITH ORDER	$250.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # BP-07-92 JACY'S SALAD BAR	04/22/1992	BUSINESS CLOSED FINE WAIVED	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # BP-08-92 KING'S LAUNDRY	04/22/1992	PERMIT FEES PAID FINE WAIVED	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-09-92 WASHING WELL LAUNDROMAT	04/22/1992	PERMIT FEES PAID FINE WAIVED	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-10-92 BRAXTON'S, INC.	04/22/1992	BUSINESS CLOSED FINE WAIVED	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

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SUMMARY OF ENFORCEMENT ACTIONS THROUGH 12/31/16
BUCKLIN POINT

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AO #BP-11-92 WOODLAWN FISH & CHIPS	04/22/1992	PERMIT FEES PAID FINE WAIVED	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-12-92 LITTLE ANTHONY'S RESTAURANT	04/22/1992	CHANGED OWNERSHIP FINE WAIVED	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # BP-13-92 SMITHFIELD AVENUE LAUNDROMAT	04/22/1992	CHANGED OWNERSHIP FINE WAIVED	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-14-92 JEHA'S TEXACO	04/22/1992	PERMIT FEES PAID FINE WAIVED	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-15-92 ESTRELA DO MAR RESTAURANT	04/22/1992	PERMIT FEES PAID FINE WAIVED	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-16-92 RICOTTI'S SANDWICH SHOP	04/22/1992	COMPLIED WITH ORDER	$100.00	$100.00	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-17-92 UNCLE TONY'S PIZZA	04/22/1992	PERMIT FEES PAID FINE WAIVED	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-18-92 SERRA DE ESTRELA RESTAURANT	04/22/1992	COMPLIED WITH ORDER	$100.00	$100.00	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-19-92 REGINA MFG.	04/22/1992	COMPLIED WITH ORDER	$100.00	$100.00	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-20-92 WOODLAWN CLEANERS & LAUNDRY	04/30/1992	COMPLIED WITH CEASE AND DESIST ORDER	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-21-92 STANDARD UNIFORM SERVICES	06/17/1992	COMPLIED WITH CEASE AND DESIST ORDER	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

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AO #BP-22-92 METROPOLITAN PLATING	04/22/1992	OUTSTDG FEES RESCINDED SUBJ. TO SHUTDOWN	$5,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-23-92 CHN ANODIZING	06/18/1992	CONSENT ORDER 03/30/93	$17,500.00	$7,000.00	$7,000.00	$0.00	$262.50	$262.50	$0.00	$0.00	$0.00	$0.00
AO #BP-24-92 PARAMOUNT CARDS	06/18/1992	CONSENT ORDER 02/09/93	$17,500.00	$2,000.00	$2,000.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #BP-26-92 SLATER SCREEN PRINT	03/10/1992	CONSENT ORDER 01/01/94	$18,000.00	$9,000.00	$9,000.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO # BP-28-92 A.T.CROSS CO.	02/06/1992	CONSENT ORDER 03/31/93	$3,250.00	$1,000.00	$1,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-02-93 SLATER SCREEN PRINT	03/18/1993	CONSENT ORDER 01/01/94	$25,000.00	$5,000.00	$5,000.00	$0.00	$500.00	$500.00	$0.00	$6,500.00	$6,500.00	$0.00
AO #BV-03-93 ELIZABETH WEBBING MILLS	05/04/1993	CONSENT ORDER 10/12/93	$25,000.00	$3,000.00	$3,000.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #BV-04-93 CHN ANODIZING	07/19/1993	CONSENT ORDER 03/08/94	$25,000.00	$5,000.00	$5,000.00	$0.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00
AO #BV-05-93 STANDARD UNIFORM	10/29/1993	CONSENT ORDER 05/03/94	$18,000.00	$11,000.00	$11,000.00	$0.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00
AO #BV-06-93 BILL'S RESTAURANT	10/29/1993	COMPLIED WITH ORDER FINE RESCINDED	$3,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO # BV-01-94 AAFCO, INC.	03/17/1994	CONSENT ORDER 09/26/96	$11,000.00	$6000 (SEP)	$6000 (SEP)	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00

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AO #BV-02-94 UNCLE TONY'S PIZZA & PASTA	07/12/1994	CONSENT ORDER 11/21/94	$12,000.00	PUBLIC AWARENESS PROJECT	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-03-94 MCDONALD'S RESTAURANT	07/19/1994	CONSENT ORDER 11/01/94	$10,000.00	$5,000.00	$5,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-04-94 MCCONNELL & CARPENTER	07/28/1994	COMPLIED WITH ORDER	$0.00 COMPLIANCE ORDER	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-05-94 COLFAX	10/13/1994	CONSENT ORDER 01/09/95	$5,000.00	$5,000.00	$5,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-07-94 UNCLE BEAN'S DINER	10/07/1994	CONSENT ORDER 12/06/94 BUSINESS CLOSED	$10,000.00	$1,000.00	$183.34	$816.66	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-01-95 LIBERTY PLATING	01/04/1995	CONSENT ORDER 08/03/95	$75,000.00	$6,000.00	$6,000.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #BV-02-95 JOSEPH'S FAMILY RESTAURANT	02/08/1995	COMPLIED WITH ORDER	$0.00 COMPLIANCE ORDER	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-03-95 SCOLA ENTERPRISES, INC.	05/30/1995	CONSENT ORDER 10/04/95	$20,000.00	$4,000.00	$4,000.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #BV-04-95 ELIZABETH WEBBING	10/02/1995	CONSENT ORDER 02/26/97	$50,000.00	$35,000.00 (SEP)	$35,000.00 (SEP)	$0.00	$750.00	$750.00	$0.00	$0.00	$0.00	$0.00
AO #BV-05-95 SLATER SCREEN PRINT	10/31/1995	CONSENT ORDER 11/20/97	$150,000.00	$35,000.00 $5,000. (SEP)	$35,000.00 $5,000. (SEP)	$0.00	$0.00	$0.00	$0.00	$5,500.00	$5,500.00	$0.00
AO #BV-06-95 TEKNOR APEX COMPANY	11/02/1995	CONSENT ORDER 06/19/96	$6,000.00	$3000.00 $3,000.00 (SEP)	$3,000.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00

TABLE 34
SUMMARY OF ENFORCEMENT ACTIONS THROUGH 12/31/16
BUCKLIN POINT

ENFORCEMENT ACTION# COMPANY NAME	AO ISSUE DATE	RESOLUTION	ORIGINAL ADMIN. PENALTIES ASSESSED	ADMIN. PENALTIES AWARDED OR AGREED TO	ADMIN. PENALTIES PAID	ADMIN. PENALTIES BALANCE	ENF.COSTS ASSESSED/ AWARDED/ AGREED TO	ENF. COSTS PAID	ENF. COSTS BALANCE	STIPULATED PENALTIES ASSESSED	STIPULATED PENALTIES PAID	STIPULATED PENALTIES BALANCE
AO #BV-01-96 STI, INC.	05/15/1996	CONSENT ORDER 07/31/96	$7,000.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-02-96 MOBIL OIL CORPORATION	05/15/1996	AO RESCINDED	$10,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-03-96 MICROFIBRES, INC.	06/12/1996	CONSENT ORDER 04/10/97	$0.00 COMPLIANCE ORDER	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-01-97 EL PANAL RESTAURANT	06/12/1997	AO RESCINDED	$5,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-02-97 REGEN CORPORATION	11/20/1997	PERMIT FEES PAID CONSENT ORDER	$5,000.00	$500.00	$500.00	$0.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00
AO #BV-01-98 BOWCAM CONTAINERS	05/19/1998	COMPLIED WITH ORDER	$2,000.00	$2,000.00	$2,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-02-98 NATIONAL RING TRAVELER	05/27/1998	CONSENT ORDER 07/28/99	$33,000.00	$16,000.00	$16,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-03-98 MICROFIBRES, INC.	12/08/1998	CONSENT ORDER 05/17/01	$112,000.00	$25,000.00	$25,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-04-98 ELIZABETH WEBBING MILLS, INC.	12/10/1998	COMPANY BANKRUPT	$134,000.00	$134,000.00	$0.00	$134,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-05-98 CHN ANODIZING	12/10/1998	CONSENT ORDER 03/18/99	$30,000.00	$12,000.00	$12,000.00	$0.00	$0.00	$0.00	$0.00	$175.00	$175.00	$0.00
AO #BV-01-99 TANURY INDUSTRIES	06/08/1999	CONSENT ORDER 08/03/99	$22,000.00	$9,800.00	$9,800.00	$0.00	$0.00	$0.00	$0.00	$900.00 AGREED UPON $600	$600.00	$0.00

TABLE 34
SUMMARY OF ENFORCEMENT ACTIONS THROUGH 12/31/16
BUCKLIN POINT

ENFORCEMENT ACTION# COMPANY NAME	AO ISSUE DATE	RESOLUTION	ORIGINAL ADMIN. PENALTIES ASSESSED	ADMIN. PENALTIES AWARDED OR AGREED TO	ADMIN. PENALTIES PAID	ADMIN. PENALTIES BALANCE	ENF.COSTS ASSESSED/ AWARDED/ AGREED TO	ENF. COSTS PAID	ENF. COSTS BALANCE	STIPULATED PENALTIES ASSESSED	STIPULATED PENALTIES PAID	STIPULATED PENALTIES BALANCE
AO #BV-02-99 BRISTOL COUNTY SEPTIC, INC.	12/22/1999	CONSENT ORDER 08/09/00	$30,000.00	$1,000.00	$1,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-01-00 ELIZABETH WEBBING MILLS, CO., INC.	06/29/2000	COMPANY IN BANKRUPTCY	$0.00 COMPLIANCE ORDER	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-02-00 WOODLAWN LAUNDRY & CLEANERS	12/28/2000	CONSENT ORDER NOT SIGNED COMPANY CLOSED	$2,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO#BV-01-02 CENTRAL SOYA COMPANY, INC.	02/21/2002	AO RESCINDED	$100,000	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO#BV-02-02 D.C.L. d/b/a SEWERMAN	04/22/2002	CONSENT ORDER 06/11/02	$30,000.00	$5,000.00	$5,000..00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO#BV-03-02 C.H.N. ANODIZING	6/28/2002	CONSENT ORDER 8/20/02	$1,500.00	$500.00	$500.00	$0.00	$250.00	$250.00	$0.00	$50.00	$100.00	$0.00
AO#BV-04-02 INSTANT SEPTIC ENVIRONMENTAL SERVICES	08/08/2002	HEARING HELD DECISION 8/13/04 COMPLAINT FILED COMPANY OUT OF BUSINESS	$20,000.00	$20,000.00 (AWARDED AT HEARING)	$0.00	$20,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO#BV-05-02 ESTRELA DO MAR	09/23/2002	CONSENT JUDGMENT 3/24/03	$5,000.00	$5,000.00	$5,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-01-03 C.H.N. ANODIZING	03/27/2003	CONSENT ORDER 8/6/04	$50,000	$12,000.00	$12,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-01-05 TANURY INDUSTIRES	9/14/2005	CONSENT ORDER 12/31/05	$108,500.00	$24,000.00 ($94,000.00 W/$70,000.00 SUSPENDED)	$24,000.00	$0.00	$0.00	$0.00	$0.00	$200.00	$200.00	$0.00
AO #BV-01-07 KIK CUSTOM PRODUCTS, INC.	9/10/2007	CONSENT ORDER 07/10/08	$109,500	$73,000	$73,000	$0.00	$0.00	$0.00	$0.00	$500.00	$500.00	$0.00

TABLE 34
SUMMARY OF ENFORCEMENT ACTIONS THROUGH 12/31/16
BUCKLIN POINT

ENFORCEMENT ACTION# COMPANY NAME	AO ISSUE DATE	RESOLUTION	ORIGINAL ADMIN. PENALTIES ASSESSED	ADMIN. PENALTIES AWARDED OR AGREED TO	ADMIN. PENALTIES PAID	ADMIN. PENALTIES BALANCE	ENF.COSTS ASSESSED/ AWARDED/ AGREED TO	ENF. COSTS PAID	ENF. COSTS BALANCE	STIPULATED PENALTIES ASSESSED	STIPULATED PENALTIES PAID	STIPULATED PENALTIES BALANCE
AO #BP-01-09 COASTAL COLLISION & TOWING, INC.	07/22/09	IMMEDIATE COMPLIANCE ORDER	$0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BV-01-10 COASTAL COLLISION & TOWING, INC.	06/15/10	CONSENT ORDER 09/17/11	$1,000	$1,000	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-01-15 Ecological Fibers, Inc.	10/06/15	PENDING	$22,000	PENDING	$0.00	$22,000	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
AO #BP-01-16 Memorial Hospital of Rhode Island	9/22/16	PAID	$2,500	$2,500	$2,500	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

VII. SPECIAL PROJECTS AND PROGRAMS

Introduction

The NBC implements many projects, programs and studies to reduce and control the discharge of toxic and other non-conventional pollutants from industrial, commercial, and residential sewer users. These projects and programs are a collaboration of staff from many sections of the NBC, including the Pretreatment, ESTA, Permits & Planning, Laboratory and EMDA sections.

The Pretreatment Section implements many projects and programs and educates users to reduce and control the release of toxics to the sewerage system. The Pretreatment Program controls, reduces and prevents pollutant discharges by issuing discharge permits to industrial and commercial users. These discharge permits may require installation of pretreatment systems and implementation of Spill and Slug Prevention Control Plans.

In addition to the Pretreatment Section reducing toxic discharges through its permitting and educational programs, the ESTA Section further reduces toxic loadings by providing free technical assistance and educational programs to local industries. Through this program, the NBC educates firms about pollution prevention techniques, such as product substitutions, so that hazardous materials can be eliminated from process operations and toxic byproducts are not generated or discharged.

The EMDA Section routinely samples permitted NBC users, providing monitoring data necessary for the Pretreatment Section to evaluate user compliance with discharge limitations. EMDA conducts water quality studies in the receiving waters of the NBC treatment facilities, contributing to the statewide effort of many agencies, institutions and organizations to understand water quality issues and determine the solutions needed to restore Narragansett Bay. EMDA also performs wastewater sampling at the two treatment facilities every day in accordance with RIPDES permit requirements. The Laboratory Section operates daily to analyze and process the thousands of samples delivered annually by EMDA. This Chapter details the projects, studies, and programs that the Pretreatment, ESTA, Permits & Planning, EMDA and Laboratory Sections have worked on in 2016.

Status of Projects, Programs and Studies

Environmental, Safety and Technical Assistance (ESTA) Program

ESTA Pollution Prevention Activities

Throughout 2016 ESTA continued to assist the industrial community with implementing pollution prevention techniques and technologies that result in less waste generation, smoother running and less costly operations, and improved environmental regulatory compliance. Pollution prevention services are free of charge, non-regulatory and confidential.

The goals and objectives of the ESTA Section pollution prevention efforts are to:

- Promote pollution prevention philosophies and methodologies among the industrial users of the NBC system;

- Identify and address regulatory and non-regulatory barriers and incentives to implementing source reduction and pollution prevention activities;

- Develop a readily available, easily accessible and efficient source of pollution prevention information for use by the industrial community.

ESTA staff performs technical assistance site visits of NBC industrial users, organizes and conducts workshops and seminars, and produces educational fact-sheets. ESTA staff conducted 23 individual site visits during 2016 on a variety of pollution prevention, energy efficiency, and environmental regulatory compliance improvement projects including:

- Auto Salvage Facilities
- Autobody Repair Facilities
- Food Service Establishments
- Metal Finishing Facilities
- Pharmaceuticals Facilities
- Printing Facilities

ESTA Grant Funds

Since the creation of the Pollution Prevention Program in 1991, NBC has been awarded many PPIS grants and several grants from other sources to initiate a variety of industrial user environmental educational and technical assistance programs. TABLE 35 summarizes the project periods and funding amounts for each of these grant awards. To date, the NBC has secured grant funding totaling $1,774,750 for pollution prevention and technical assistance activities.

TABLE 35
Summary of Grant Awards

Program	Grant ID#	Project Period	Original Grant Award
Initial Pollution Prevention	NP818873-01-0	10/01/91 - 09/30/97	$300,000
Training Grant – CCRI Pollution Prevention Course	NP991705-01-1	10/01/95 - 09/30/98	$60,000
Clean P2 – Regulatory Relief Program	NP991756-01-0	10/01/96 - 09/30/00	$85,000
NBC Metal Finishing 2000 Program	NP991195-01-0	10/01/97 - 09/30/00	$35,000
NBC Metal Finishing Seminars	NP991402-01-0	07/01/98 - 09/30/00	$25,000
Environmental Management Systems	NP991679-01-0	10/01/99 - 09/30/01	$32,000
Environmental Best Management Practices	NP98121801-0	10/01/00 - 03/31/03	$35,000
MP&M Pollution Prévention Audits	NP98142601	10/01/01 - 09/30/03	$50,000
Pollution Prevention in RI Hospitals	NP98154501-0	10/01/02 - 09/30/04	$25,000
Auto Salve Yard Pollution Prevention	NP98182201-0	10/01/03 - 09/30/05	$25,000
Stormwater Pollution Prevention	NP97107901-0	10/01/04 - 12/31/07	$35,000
Energy Conservation	NP97126001-0	10/01/05 - 09/30/08	$35,000
Renewable Energy - Wind	RI State Energy Grant	07/01/06 - 09/30/08	$25,000
Renewable Energy - Biogas	RI State Energy Grant	07/01/06 - 09/30/08	$25,000
Energy-EMS Project	EI-97187901	10/01/08-09/30/11	$275,000
Energy Technical Assistance Assessments	3232910	05/16/11-03/31/12	$86,000
Energy Efficiency Projects	3233807	05/16/11-03/31/12	$311,750
Water Utility Energy Efficiency	N/A	01/01/13 – 12/31/14	$10,000
RI Renewable Energy Fund	N/A	N/A	$300,000
Total Grants Awards To NBC			**$1,774,750**

In addition to grant funded projects, ESTA is involved with many environmental programs and projects that promote the use of pollution prevention and sound environmental management practices among NBC users and the industrial community throughout the State of Rhode Island.

Energy Conservation Program

The NBC has been awarded numerous grants over the years to help develop and implement energy movement programs throughout the State of Rhode Island. Municipal wastewater treatment operations utilize tremendous amounts of energy. With current rising energy costs, safety and environmental impact concerns over the storage and use of conventional fuels such as liquefied natural gas and petroleum derived fuels, it is imperative that wastewater treatment facilities have an in-depth understanding of available energy conservation techniques and alternative energy sources.

As part of the efforts the NBC conducted detailed energy audits of its various facilities and operations in order to identify energy conservation opportunities and continued to research feasibility of utilizing renewable energy on a large scale to reduce its dependency on more conventional non-renewable energy sources.

Renewable energy sources investigated included:

- Low impact hydroelectric energy captured from wastewater flow
- Wind derived energy
- Combined heat and power utilizing biogas
- Fuel Cells utilizing
  - Bio-gas
  - Hydrogen derived from solar electro-dialyses of treated wastewater effluent
  - Energy derived from nitrification/de-nitrification chemical reactions
- Geothermal energy
- Solar energy

Information collected as part of these energy audits and studies was used to develop written energy use and conservation best management practices and fact sheets to help both the NBC and other wastewater treatment plants make informed decisions regarding their energy use and conservation practices. Results of these efforts have been presented to other Rhode Island and regional wastewater treatment facilities as part of energy use workshops. In 2016:

- NBC purchased three off-site wind turbines designed to net meter renewable wind energy to various NBC electrical billing accounts,
- NBC's three existing 1.5 MW turbines located at Field's Point supplied 47% of the electrical power demand of the plant,
- NBC's Biogas CHP project at Bucklin Point continued to be developed,
- NBC issued a Request for Qualifications and Proposals (RFQ/P) for a 10 MW net metered solar array system, and
- NBC upgraded all facility lighting to LEDs.

Additional energy management related activities conducted in 2016 include:

- Served on multiple NEWEA Committees including the Safety, Sustainability and the Energy Committee
- Presented the NBC Energy Focused Environmental Management System Project at an ACEEE Summer Study Program
- Conducted Energy Audits of two pump stations
- Reviewed proposals, contracts, legislation and attended meetings related to renewable energy
- Tracked and reported quarterly REC production data
- Attended meetings on the Biogas Engine Project
- Helped secure grants and energy incentives
- Conducted Energy Management Presentations/Tours of NBC facilities
- Attended USDOE's Better Buildings Summit and participated in monthly teleconferences

Energy Management of Wastewater Treatment Facilities

In October 2008, NBC was awarded a $275,000 grant from the EPA to initiate a program for developing sustainable energy management plans for the 19 wastewater treatment facilities in Rhode Island. The NBC State Innovation Grant Project had two components. The first component was to develop a program for Rhode Island treatment plants on Energy Focused Environmental Management Systems (EF-EMS) using the *plan-do-check-act* (PCDA) approach to continuous process improvement, to reduce energy use and improve energy efficiency for WWTFs. The second component consisted of developing a Fats, Oils & Grease (FOG) Management Environmental Results Program (ERP) for Food Service Establishments (FSE). The ERP will help these businesses improve compliance with the NBC Grease Control Program and create incentives to encourage the use of waste grease as a renewable energy source.

The project goal for the Sustainable Energy Management component of the project was to develop and implement EF-EMS for treatment facilities including:

- Use of the EPA Energy Guidebook to train participating facilities on how to establish and implement a successful EF-EMS;
- Develop energy-use baselines for each participating treatment facilities;
- Conduct energy use assessments for participating facilities;
- Identify potential Energy Conservation and Efficiency Measures;
- Assess renewable energy resource opportunities.

Additionally, the project established a roundtable to assist each participating treatment facilities with implementation of their EF-EMS.

All tasks associated with this grant funded project have been completed. Through a series of workshops, treatment plants were trained on the PDCA approach and the use of EPA Portfolio Manager. Site visits, conducted by NBC staff and the primary state energy provider, National Grid, produced nineteen energy assessments, including renewable energy opportunity assessments and eleven follow up technical assessments identifying more than 100 energy efficiency measures. As part of these efforts an additional $3,000,000 in ARRA grant funding was made available from the Rhode Island Office of Energy Resources (RIOER) to help implement identified energy efficiency measures.

In 2013 the RIOER received a grant from the U.S. Department of Energy (DOE) in part to improve the energy efficiency of local government and public agencies. Due to the NBC success with coordinating and conducting these assessments for the wastewater sector it has been asked to assist with this grant project. RIOER has dedicated $10,000 in grant funds to NBC for assistance with coordinating the renewable energy assessments of publicly owned water utilities in Rhode Island.

In 2016 ESTA staff followed up on several renewable energy assessments conducted of RI water supply and wastewater treatment facilities as part of this DOE grant funded project.

NBC Environmental Merit Awards Program

In 1995, the NBC developed the Environmental Merit Awards Program to recognize companies that have demonstrated environmental efforts and commitments that go beyond mandated compliance requirements. As part of this awards program, the NBC also recognizes all SIUs that have achieved full compliance with all NBC requirements during the previous calendar year.

In 2016, the NBC recognized numerous firms for their exemplary environmental activities performed in 2015. NBC recognized nineteen companies with Perfect Compliance Awards for achieving 100% compliance with all NBC regulatory requirements, one company received an Environmental Merit Award, and one company was recognized for its efforts with managing storm water. The 2015 award recipients are as follows:

Perfect Compliance Award Winners:

A. Harrison & Company, Inc.
Darlene Group, Inc.
Dominion Energy – Manchester Street, Inc.
Electrolizing, Inc.
Godfrey & Wing, Inc. d/b/a Impco, Inc.
Hord Crystal Corporation
Induplate, LLC
Interplex Engineered Products, Inc.
John H. Collins & Sons Company
Metallurgical Solutions, Inc.
Narragansett Jewelry d/b/a C&J Jewelry Company
Pawtucket Power Associates
Providence Metallizing Company, Inc.
Stackbin Corporation
Tanury Industries PVD, Inc.
Technodic Inc.
Tiffany and Company
Truex, Inc.
Univar USA, Inc.

In addition one Storm Water Management Excellence Award was presented to The Foundry for reducing storm flow from entering NBC facilities.

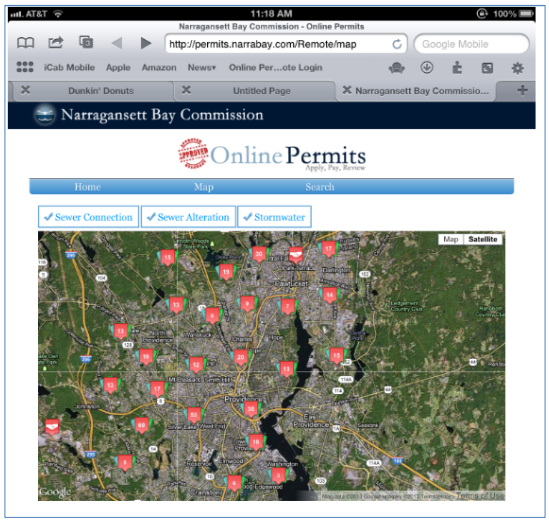
Each award recipient received a plaque and had their company name and environmental accomplishments published in the Providence Journal. Applications for the 2016 NBC Environmental Merit Awards will be available on-line in late February 2017 and the presentation of these awards will take place in early April 2017.

Sewer Connection Permit Program

Since 1982, the NBC has been reviewing all applicants' requests to connect to its sewer system either directly to NBC owned and maintained sewers, or indirectly to City/Town maintained sewer lines. The sewer connection permit process is necessary to ensure that the structural integrity of the sewer line is preserved, to control and monitor wastewater flow capacity, to minimize storm water discharges, to control toxic pollutant discharges, to maintain quality customer service and to ensure accurate billing of new users.

As the Permit & Planning Section receives comments from the various sections, they are compiled and addressed. After all comments have been satisfactorily addressed, a permit is prepared and issued. In 2012, new Permit Section software was developed and put on-line. The software allows additional information to be entered and tracked and the software automated the processing of permits. In addition to the automation of permit processing, the software upgrade automated the application process. Applicants can now complete applications on-line and submit the application and payment electronically. A workstation was installed in the PP&R office area for applicants to use to complete applications.

The software incorporates Google Maps and each sewer connection is displayed on the map once entered by staff. By clicking on the project the viewer will be able to access relevant information such as the location, and type of connection.



In 2016, 270 Sewer Connection Permit applications were processed, the majority of which were for residential connections. Pretreatment reviewed 31 of these sewer connection permit applications to determine if a Wastewater Discharge Permit would be necessary. All of the applications reviewed by Pretreatment were responded to accordingly.

Storm Water Mitigation Program

Permits & Planning staff regularly work with building officials and developers to implement Storm Water Management techniques for new construction projects. As part of the Sewer Connection Permit Application process, a Storm Water Management Plan must be developed. This plan must evaluate storm water mitigation for the site, including the use of Low Impact Development (LID) or Best Management Practices to eliminate or reduce storm water flows to the treatment facilities as well as the investigation of alternative options to direct discharges into natural waterways. By requiring Storm Water Management plans and firms installing LID, 430,849 gallons of additional stormflow, was eliminated from the Field's Point sewer system in 2016 for each three month storm event. These are storm water flows that would have impacted the NBC combined sanitary/storm sewer collection system and CSO tunnel. This program, which was established in 2003, mitigated 7.45 million gallons of storm flow from the Field's Point system based on a three month storm event, the design basis for the CSO tunnel. This provides additional capacity in the CSO tunnel for raw sewage requiring capture and treatment. Annually the NBC issues a Storm Water Management Excellence Award to the firm that implements the best storm water reductions by utilizing LID technologies. The success of this program has been recognized on both the local and national levels. In 2008, the National Association of Clean Water Agencies (NACWA) presented the NBC with an Environmental Merit Award and the Environmental Business Council, presented the NBC with the Leadership Award for a Non-Profit Organization for this program.

Mercury Loading Reduction Program

The NBC participated in the Rhode Island Mercury Education and Reduction Group. The objective of this group was to identify sources of mercury discharge and pollution in Rhode Island, educate the public regarding mercury issues and eliminate mercury pollution for future generations. Studies indicated that the majority of mercury loadings observed in the sewer system were the result of mercury/silver dental amalgam. As a result, dental operations were evaluated so that the mercury amalgam issue could be addressed and incorporated into wastewater discharge permits issued to dental facilities.

In January 2004, the NBC completed a Best Management Practice (BMP) document for dental facilities to ensure that dental mercury is properly handled, treated and disposed. The NBC worked closely with the Rhode Island Dental Association during the BMP development process to ensure that the BMP addressed both environmental concerns and those of the dentists.

As part of the BMP, dental facilities are given two options to discharge wastewater that may be contaminated with waste dental amalgam. The first option requires the installation of an amalgam separator. The second option does not require the installation of pretreatment equipment but requires the dental facility to sample the waste streams potentially contaminated with mercury and be in compliance with stringent mercury discharge limits. All dental facilities are required to implement other programs regarding training of staff and storage and disposal of amalgam waste. To date all dental facilities in the NBC districts have been permitted and installed amalgam separators.


State of Rhode Island and Providence Plantations
OFFICE of the GOVERNOR
The Governor
of the
State of Rhode Island
Extends His
Greetings and Best Wishes to the
Narragansett Bay Commission
In Recognition of
implementing Environmental Best Management Practices in its Management of Waste Dental Amalgam program, which addresses a significant source of mercury emissions in Rhode Island. NBC's achievements in this area demonstrate a commitment to the environment and the health and public safety of all Rhode Island residents.
In recognition whereof, I have hereby set my hand and caused the Executive Seal of the State of Rhode Island and Providence Plantations to be hereunto affixed this 24th day of September 2009.
Donald L. Carcieri
Governor

The NBC was awarded a Citation by the Governor of Rhode Island for the development and implementation of the BMP. The NBC Dental Amalgam BMP Program has been recognized on a national level by NACWA, and was awarded on Environmental Achievement Award for developing the BMP.

The NBC participated in a NACWA sponsored three year international mercury loading study of treatment plants that have implemented mercury amalgam discharge control programs. From 2003 through July 2006 EMDA has collected influent, effluent, sludge and grit samples monthly at Field's Point using "Clean Sampling" techniques and the samples were analyzed by both the Hampton Roads Sanitation District in Virginia and NBC laboratories. The comparison of these results helped the laboratory achieve low level mercury "clean analysis" of <1.0 ppt. To

date the laboratory detection limit for mercury is 2.0 ppt, the lowest levels achievable in the state of Rhode Island. The NBC mercury reduction project has been very successful at reducing mercury loading. Since the inception of the BMP program mercury influent loadings to the NBC wastewater treatment facilities were reduced by 62.3% at Field's Point and 57.1% at Bucklin Point.

In 2011, the EPA began to develop categorical standards for dental facilities. The NBC participated in conference calls with representatives from the EPA, multiple states and other pretreatment programs that have implemented programs to control the discharge of dental amalgam. The EPA used the information obtained during these calls to develop categorical standards. In anticipation of the publication of the EPA Dental Rule, a session on dental/mercury discharges was held at the 2014 NACWA Pretreatment & Pollution Prevention Workshop held in Minneapolis, MN. The development of the NBC Dental BMP program was presented during this session. The proposed rule was published in October 2014. The NBC participated in conference calls with representatives from NACWA and Pretreatment Programs across the country regarding the proposed rule and completed a NACWA Survey. The NBC submitted comments on the proposed rule in early 2015. The final rule was published in late 2016. However, the EPA withdrew it prior to publishing it in the Federal Register.

Throughout 2016, the dental facilities permitted by the NBC continued to comply with their permits and follow the BMPs. Annual certifications of adhering to the BMPs continue to be submitted in compliance with permit requirements.

Grease Control Program

In 1990, the NBC instituted a Grease Control Program to control the discharge of grease and animal fats from restaurants and food preparation facilities into the sewer system. At that time, the NBC was experiencing major operational problems within the sewer system and at the wastewater treatment facility, problems directly attributable to grease accumulation. These problems ranged from grease fouling equipment and controls at the wastewater treatment facility to grease completely blocking the flow in sewer lines, resulting in sewage backups into the basements of homes and businesses. The NBC Grease Control Program has essentially resolved these problems.

The NBC Grease Control Program is a permitting program which requires users with the potential to discharge grease laden wastewater from food preparation operations to install one of two acceptable types of grease removal equipment, the automatic electrical mechanical grease removal unit (GRU) or the in-ground passive grease interceptor (GI). The permit requires the user to implement a series of BMPs which are incorporated into the permit to ensure the proper operation of the grease removal unit. Over the years, the NBC has held many workshops regarding grease removal technologies and is presently conducting studies regarding the effectiveness of the various types of grease removal units.

The Grease Control Program is a well established, successful program. Pretreatment Programs from other municipalities often request assistance from the NBC in establishing their programs and resolving grease related issues.

During 2016 Pretreatment staff worked with Public Affairs staff to develop a Residential Grease Control Program. The purpose of this program is to educate the public on the impacts of fats, oil and grease on the sewer system and the proper way to dispose of grease. A mascot, Mr. Can, was created along with the slogan "Cool It and Can It". A story entitled "Mr. Can vs The Grease Beasts" is being designed by a graphic designer.

Spill Prevention Control and Countermeasures and Storm Water Pollution Prevention Plans

During 2010, the Field's Point facility was required to develop a Spill Prevention Control and Countermeasures Plan (SPCC) in accordance with 40CFR112. The task to develop the SPCC was assigned to the PP&R Section. Pretreatment, ESTA and Permits & Planning staff reviewed the regulations to determine the best approach. This review revealed that many of the requirements for the SPCC were also the same as the requirements for the Storm Water Management Plan (SWMP) required by the NBC General Storm Water Permit issued by the DEM. These requirements include facility site plans, topographical maps, spill control measures, secondary containment, emergency response procedures, a list of emergency response team members and inspection protocols. Based upon the commonality of the plans it was decided to create an operations manual for Field's Point which incorporated both the SPCC and SWMP. The manual also included standard operating procedures for deliveries of chemicals, waste handling, spill response for oil products and other materials, a list of emergency response contractors, spill/release response forms and checklists to aid in performing required inspections. The SPCC/SWMP Operations Manual for the Field's Point facility was submitted to the EPA on October 26, 2010. PP&R staff evaluated the other NBC properties to determine where SPCCs and SWMPs were required. It was determined that these plans needed to be developed for the Bucklin Point facility and the Ernest Street/CSO Tunnel Pump Station site due to the volume of oil stored at these locations. The operations manuals for the locations were developed during the latter part of 2010 and early 2011. The manual for the Ernest Street/Tunnel Pump Station site was submitted to EPA on January 7, 2011 and the Bucklin Point manual was submitted on January 31, 2011. In 2013 the upgrades to the Field's Point plant were completed. Throughout 2014, PP&R continued to revise the SPCC/SWMP Operations Manual for Field's Point to comply with the General Storm Water Permit issued in 2013. The revision incorporates the SPCC/SWMP plans for both the plant and the Ernest St./Tunnel Pump Station site. In addition, a section was added for spill control procedures to be used by the Interceptor Maintenance Section.

On July 21, 2016 the DEM conducted a Multi Sector General Permit Storm Water inspection of the Bucklin Point treatment facility. The DEM inspector identified sections of the SWMP that needed to be revised as well as areas of the plant that needed to be addressed. The Bucklin Point SWMP was revised to incorporate the DEM requirements and submitted to DEM on September 23, 2016.

Both the SPCC and SWMP require annual inspections of the facilities and training on the plans. PP&R staff conducted the inspections at Field's Point, Ernest Street/Tunnel Pump Station Site and Bucklin Point throughout 2016. The training at both facilities was conducted in May and December of 2016.

Nine Minimum Controls Compliance Program for CSOs

Throughout 2016 the Pretreatment, ESTA and EMDA sections continued to ensure compliance with the pretreatment, pollution prevention and monitoring elements of the Nine Minimum Controls Program for CSOs detailed in the NBC RIPDES permits. The Pretreatment and ESTA sections continued to work with industry to ensure compliance with these requirements. Companies are required to install and implement adequate spill control measures to ensure prohibited materials are not incidentally or accidentally discharged to the sewer system or storm drains. Firms are also required to conduct routine self-monitoring to demonstrate compliance with NBC discharge limitations. Firms experiencing compliance problems are encouraged to contact ESTA staff for help to come back into compliance. These programs ensure that industrial wastewater is properly treated to levels acceptable for discharge and ensure that materials cannot be spilled into the sewer system or through a CSO.

The effectiveness of the NBC Nine Minimum CSO Controls Program is routinely evaluated by sampling conducted by EMDA. EMDA staff collect numerous samples to ensure compliance with the Nine Minimum Controls Program. In addition to the industrial and manhole sampling discussed in CHAPTER IV, EMDA collects twice weekly samples for fecal coliform from the Woonasquatucket, Providence, West, Blackstone, Seekonk, and Moshassuck rivers. Sampling of these rivers is conducted during both wet and dry weather events. The results from these sampling events for fecal coliform are promptly reviewed to identify dry weather discharges and CSOs are immediately inspected by Interceptor Maintenance staff to ensure they are properly functioning. EMDA also re-samples sites that show high fecal coliform bacteria concentrations during dry weather periods. Samples greater than 1000 MPN/100 ml are re-sampled under dry weather conditions. EMDA works with the IM Section to analyze the data in order to identify dry weather overflows or other sources of bacteria to the rivers where combined sewer overflows are located. Other extensive monitoring of the Providence and Seekonk Rivers has indicated the rivers are meeting the EPA aquatic life criteria standards for toxics, including dissolved metals and ammonia. This demonstrates the effectiveness of the Pretreatment and ESTA Programs and the effectiveness of the NBC Nine Minimum Controls Program. This data also has been used to remove the Providence and Seekonk Rivers from the EPA 303(d) list of impaired water bodies for dissolved metals impairment.

In 2016, EMDA staff collected samples at CSOs located in the Bucklin Point district to measure contaminant levels discharged during wet weather overflow events. Samples are collected at various times throughout the storm event, at the first flush, the height of the storm and near the termination of the event. CSO sites located downstream of industrial areas were selected for this sampling. Grab samples were collected for toxics, including total metals,

TSS, BOD, VOCs, Oil & Grease, TPH and cyanide. All analytical results from samples collected during 2016 were compared to the NBC local discharge limitations for the district. All samples met the local limits, indicating the NBC Pretreatment and pollution prevention elements of the NBC Nine Minimum Controls Program are effective.

River Restoration Initiative

In response to the chronic pollution visible on the Woonasquatucket River in downtown Providence, Narragansett Bay Commission Chairman Vincent Mesolella established the Woonasquatucket River Restoration Initiative in 2002. With an aggressive goal to involve NBC employees, local business owners and members of the community in reclaiming the Woonasquatucket as a valuable community resource, and guided by the expertise of the Woonasquatucket River Greenway Association, much progress has been made to clean this river.

In 2016 the NBC continued the grant program intended to diversify the positive impact on multiple rivers in the NBC service area rather than focus solely on the Woonasquatucket River. The grant program assisted numerous local organization, cities and towns by providing 21 small grants to 20 organizations totaling $11,000 that allowed the organizations to purchase supplies to organize clean up events and river restorations activities in the NBC service district. The 2016 grant recipients are listed below:

Blackstone Heritage Corridor
Blackstone River Watershed Council/Friends of the Blackstone
City of Central Falls
City of East Providence, Department of Public Works
City of Providence
East Providence Police Explorers Post 750
Edgewood Waterfront Preservation Association
Friends of the Moshassuck/Neighborhood Alliance of Pawtucket
Keep Blackstone Valley Beautiful
Miss Rhode Island Scholarship Program Organization
Neutaconkanut Hill Conservancy, Inc.
Save the Bay
Serve Rhode Island
Ten Mile River Watershed Council
The Pawtucket Foundation
Town of Smithfield
UPP Arts
WaterFire Providence
Waterman Street Dog Park Association
Woonasquatucket River Watershed Council

Emergency Situation/Extreme Conditions Sampling

The NBC has established a program to immediately provide monitoring in the event of an extreme weather condition or an emergency that may adversely affect water quality in the receiving waters. The NBC is prepared to immediately undertake any monitoring necessary to evaluate the impacts from this type of event. During October 2016 a bloom

of Pseudo-nitzschia occurred in Rhode Island's coastal waters. Pseudo-nitzchia is a phytoplankton species that can produce domoic acid (DA). DA can cause Amnesiac Shellfish Poisoning if shellfish containing the toxin are consumed. This bloom lead to an unprecedented Harmful Algal Bloom (HAB) shellfish closure for all of Narragansett Bay, Sakonnet River, and Mt. Hope Bay. This HAB bloom is not believed to be related to discharges from sewage plants. The DEM undertook an extensive phytoplankton monitoring program to investigate the HAB and enlisted the NBC to assist with the collection of samples on two occasions. Data from the NBC routine phytoplankton monitoring program was also shared with the RIDEM. This monitoring was necessary to guide the HAB closures as the bloom developed and eventually receded. These actions ensured that shellfish harvested from Rhode Island's waterways was safe to consume.

Special sampling performed in response to emergency situations or extreme weather conditions is important to evaluate the effect of these events on water quality and provides data that is critical to water quality management decisions.

Regional Ocean Modeling System – ROMS

Since 2004, NBC has funded joint work with the coastal physical oceanography lab led by Dr. Chris Kincaid of the University of Rhode Island Graduate School of Oceanography on circulation and hydrodynamic modeling efforts for the Narragansett Bay. The goal of this work is to develop a highly accurate model of circulation and transport within the Providence and Seekonk Rivers and Narragansett Bay to support sound science management decisions. This model provides an important tool to evaluate and predict water quality in Narragansett Bay as nutrient loadings are dramatically reduced, and may ultimately help with the development of a nutrient Total Maximum Daily Load (TMDL) for Narragansett Bay.

Previous work on this project resulted in a high resolution Regional Ocean Modeling System (ROMS) of Narragansett Bay (NB-ROMS), from an open ocean boundary at the mouth of Narragansett Bay through the Seekonk River. The NB-ROMS model accurately reproduced several features that characterize flow in Narragansett Bay, including the tidally averaged flows that typically circulate in a counterclockwise fashion, up the East Passage and down the West Passage, and the gyre that occurs on Edgewood Shoals. NB-ROMS was used to test dispersion from major riverine and wastewater treatment facility (WWTF) inputs into the Bay through a modelled dye study. These results demonstrated unanticipated flows, such as a northward transport of Taunton River water to the Providence River, and a Pawtuxet River flow that separates into a southerly surface flow, a northerly intermediate depth flow, and a northerly deep flow.

The limitations of the NB-ROMS model primarily include a simplified representation of the Seekonk River without bathymetry or coastline and a lack of incorporated ecosystem processes that would transform dispersed nutrients. An updated model (SNB-ROMS) has been completed which incorporates an accurate grid representation of the Seekonk River coastline and bathymetry and an NPZD (nutrient, phytoplankton, zooplankton, detritus) model which allows for physical and ecosystem modeling. Modeled circulation results from SNB-ROMS closely approximate field data from current meters deployed in Narragansett Bay. Simulations of WWTF nutrient point source releases with the NPZD SNB-ROMS model showed that phytoplankton levels, linked to hypoxic events, are

improved when WWTF effluent nitrogen concentrations are reduced from 15 mg/L to 5 mg/L. Phytoplankton populations were not significantly reduced when WWTF effluent nitrogen concentrations are reduced from 5 mg/L to 3 mg/L or 0 mg/L. Other natural effects and parameters such as wind, light extinction, and growth rates for phytoplankton/zooplankton had a greater effect on spatially averaged phytoplankton concentrations than the varying WWTF effluent nutrient concentrations. These results are currently being prepared for publication in an academic journal.

Field work in 2016 included the deployment of ADCP and CTD sensors from July 28, 2016 through October 25, 2016 at the Bullock Reach site, which is a challenging site to accurately model. This site may be located at a hydrographic boundary, with complex flows. Data from the deployment is expected to reveal the nature of this boundary. Comparisons between the SNB-ROMS model and the 2016 dataset will improve the skill of the SNB-ROMS model. For a more detailed history on this project and to access the reports produced for this project, visit:
http://snapshot.narrabay.com/app/LearnMore/ModelingProject.

Laboratory Information Management System

A LIMS system is a repository of laboratory data in which many types of functionality can be programmed in. Functionality such as automatic report generation and email notifications helps the Field's Point treatment facility and the Bucklin Point treatment facility make operational decisions rapidly. All laboratory instruments are connected to the LIMS, which will allow for a faster way of entering lab results into the software.

A new barcode scanning system was implemented to enter, track and receipt samples in the lab to improve efficiencies. The barcode system will enable the lab to monitor the life cycle of a sample by generating reports of a sample's storage location and the location of where the samples are processed. The barcode system will eliminate time consuming paperwork. In 2012, the perking Elmer LIMS system became operational. Throughout 2016, LIMS systems were evaluated with specialists from several companies conducting presentations at NBC. In the late 2016, the NBC Information Technology Department purchased a Thermo Fisher Laboratory Information Management System (LIMS) to replace an older LIMS system.

Monitoring Data Management

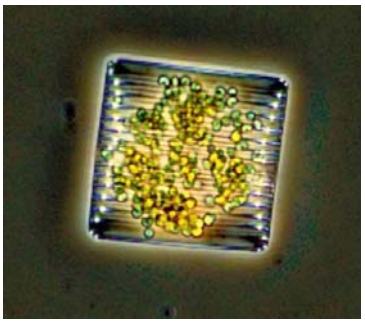
The NBC has been in the process of developing a centralized database for all analytical data generated by the NBC including from industrial, manhole, plant, river and bay sampling events in a electronic format. Staff have been busy locating historical monitoring data in paper format and is working to transfer this data into electronic format.

In 2013 progress was made with the development of this electronic database. As a part of the upgrades to the LIMS a software package, Hachwims, was put online. All data generated by the Perkin Elmer LIMS is electronically transferred to Hachwims. In addition, plant data generated by the plant information system (PI) is electronically transferred to Hachwims. During 2016 the database was made more robust by adding additional data codes and inputting historical data. EMDA staff run reports each month to complete the Discharge Monitoring Report (DMR) from this system.

In 2011, PP&R and IT staff developed and launched a website, "Snapshot of Upper Narragansett Bay" which can be accessed through www.narrabay.com. The website is maintained on a regular basis with information regarding water quality and analytical data from plant effluent samples. Real time data from NBC fixed monitoring sites located Bullocks Reach and Philipsdale Landing is displayed on the site. All of this information is readily available to the public and the site has over 300 visitors daily. Ultimately the data in the centralized database will be able to be accessed by the public through Snapshot.

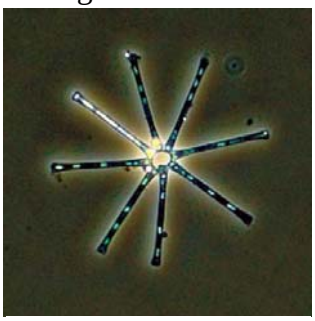
Phytoplankton Monitoring

During 2016, the NBC continued to collect samples one to two times each month for phytoplankton analysis on the Bay, to better understand the complex dynamics of the Bay ecosystem and how it is impacted by nitrogen reductions by the NBC and other inputs. The initial focus of the plankton monitoring initiative was to collect data on the phytoplankton community in the upper Bay. The NBC collected samples from the surface at the Bullock's Reach water quality station. Samples were collected from April through December in 2016. The Bullock's Reach station was selected as the plankton monitoring location because it is the site of on the NBC fixed site near-time water quality monitoring stations. With chlorophyll concentrations constantly monitored at the site, the NBC can collect routine planned samples, and also collect additional samples when chlorophyll concentrations escalate, indicating a phytoplankton bloom is present. Results are posted in a blog format on the NBC website www.snapshot.narrabay.com.



Striatella

Two phytoplankton samples are collected on each sample day. One of the samples is collected using a phytoplankton net, which is deployed at the surface for 30 minutes, while the other water quality samples are being collected. The plankton net captures the plankton floating on the surface and concentrates them in a sample bottle. The other sample is a whole water sample, also collected from the surface. Laboratory staff examines a sub-sample of the plankton net sample under the microscope to identify all of the types of phytoplankton present in the sample. From the whole water sample, a specific volume of water (1 mL) is examined under the microscope to determine the genus and number of



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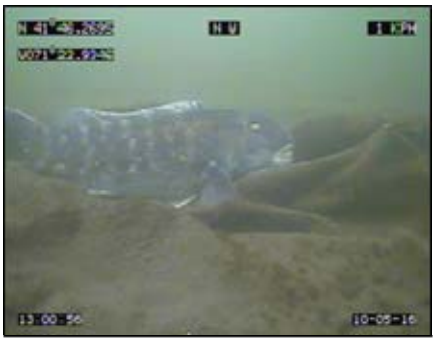
each type of phytoplankton present in the sample. Through this complete analysis, the NBC will be able to track changes in the phytoplankton population and community structure as nutrient reductions occur in the upper Bay. Also, the NBC collaborated with the University of Rhode Island – Graduate School of Oceanography (URI-GSO). Through aligning the NBC methods with those of UIR-GSO, who collects data in the lower Bay, comparisons can be made between the phytoplankton variation in the Providence River and upper Bay with that present in the lower Bay.

Benthos Monitoring



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During 2016, EMDA continued benthic video monitoring, utilizing an underwater video camera to observe the state of the benthos in the NBC receiving waters. While this monitoring initiative is relatively new to the program, begun in 2014, long-term monitoring of the benthos in this way will allow the NBC to track changes in local benthic conditions as nutrient reductions and other infrastructure improvements occur in the upper Bay. Transects were conducted along three permanent transect paths in the Providence River; surveys were attempted monthly, though unsuccessful due to poor weather conditions on several occasions. Discussions of results and observations made during these video surveys are currently being posted to the NBC webpage in an effort to share these findings with interested members of the public. As the techniques continue to be refined, more quantitative analyses are being conducted, improving the scientific rigor and information potential of this relatively new initiative. In 2016, staff began evaluating videos using the Coastal and Marine Ecological Classification Standard (CMECS), created by NOAA and partners to standardize habitat classification across studies. New camera and lighting equipment were also tested in 2016, leading to greater ability to distinguish organisms and habitat characteristics in low-visibility footage.

On Going Projects

Over the years the Pretreatment, ESTA and EMDA Sections initiate many projects that have become integral parts of the routine activities of each department. Work continues to be performed on these long established NBC projects. The following is a listing of some of these projects:

Commercial Pesticide Control Program
Copper Sulfate Root Killer Prohibition
Fuel Oil Discharge Control Program
Medical Waste Control Program
Environmental Management Systems Program
Pollution Prevention for Hospitals and Health Care Facilities
Pollution Prevention for Auto Salvage Yards
Septage Permitting Program
Treatment Plant Influent Computer Monitoring Program
Floatables Control Program
Mussel Study
Emerging Pollutants Study
Woonasquatucket River Education Project
Water Audit and Technical Assistance Program
Storm Water Pollution Prevention Program
CSO Tunnel Evaluation
Fixed-Site On-Line Water Quality Monitoring
Computerization of Sewer Maps

The NBC will continue to be a leader, locally and nationally, developing programs, projects and initiatives that will control and reduce the discharge of pollutants to our treatment facilities, and ultimately Narragansett Bay. This work will continue in 2017.

VIII. NBC PRETREATMENT PROGRAM GOALS

Status of 2016 Goals

This chapter outlines the progress made during 2016 toward meeting the goals established in the 2015 Pretreatment Annual Report and defines goals for 2017.

- **2016 Goal:** Publish Pretreatment Program Annual Report

  Accomplishment: The 2015 Pretreatment Program Annual Report was completed and submitted to the DEM on March 14, 2016 in compliance with the NBC RIPDES permits. In order to make the report accessible to the public, it is uploaded to the NBC website, www.narrabay.com annually. The 2015 Pretreatment Annual Report was uploaded to the internet on March 16, 2016. The content of the 2015 Annual Report is also presented to the NBC Citizens Advisory Committee (CAC) at their April meeting held on April 20, 2016.

- **2016 Goal:** Satisfy all EPA and DEM Pretreatment Program mandates such as sampling and inspecting each Significant Industrial User (SIU) at least once every twelve (12) months. As an additional goal, the Pretreatment and Environmental Monitoring personnel will attempt to inspect and sample all SIUs at least twice each twelve month period.

  Accomplishment: The NBC satisfied the EPA and DEM mandates for conducting sampling and non-sampling inspections of each SIU at least once every twelve (12) month period. Each SIU was inspected at least once during this report period, and within twelve months of their previous inspection date. The Pretreatment Section performed well toward satisfying its goal to inspect each SIU twice, as all but two SIUs, Microfibres, Inc. and Orbit Energy Rhode Island, LLC., were inspected two or more times during 2016. The EMDA Section performed well toward satisfying the NBC goal to sample each SIU at least twice. However, three SIUs were not sampled twice during 2016. One SIU, Microfibres, Inc. was only sampled once and two SIUs, Orbit Energy Rhode Island, LLC and Tanury Industries PVD, Inc. were unable to be sampled. Microfibres, Inc. was a textile manufacturing company. In early January 2016 the company abruptly ceased operations prior to the company vacating the building. Therefore, only one inspection and monitoring event could be conducted. Orbit Energy Rhode Island, LLC is a new SIU that will be conducting food waste to energy operations. For most of 2016 the facility was under construction. Process operations and discharges are to begin in 2017. An inspection of the site was conducted in late 2016. EMDA was unable to collect a sample as process wastewater was not generated in 2016. Tanury Industries PVD, Inc. conducts physical vapor deposition operations. The company collects all process wastewater and discharges on a batch basis. EMDA staff contacted the company throughout the year to determine if a batch was ready to be discharged.
  The company sent all wastewater offsite for disposal. Therefore, samples were unable to be collected. Many SIUs were sampled more than twice due to the implementation of the monitoring procedure to resample any user once a violation is observed as a result of a NBC sampling event. Additional information regarding the NBC sampling and inspection programs is provided in CHAPTER III.

- **2016 Goal**: The Pretreatment staff will attempt to conduct an annual inspection of each non-significant industrial user, annual inspections of 75% of restaurants and food processing facilities to ensure compliance with grease removal regulations, and 50% of all other permitted commercial users.

  Accomplishment: In 2016, the Pretreatment staff conducted 2,032 inspections of commercial and industrial users. Pretreatment staff performed thorough inspections of 100% of permitted non-significant industrial users, performing 373 inspections of this classification of user. During 2016, Pretreatment staff inspected 61.0% of the permitted restaurants and commercial buildings with cafeterias, conducting 686 inspections of facilities in these two categories. Pretreatment staff inspected 54.8% of all other commercial users, meeting the self-imposed goal. There were 496 inspections conducted of commercial users during 2016. Additional information regarding the NBC inspection program is provided in CHAPTER III.

- **2016 Goal:** Perform prompt reviews of user permit applications and plan submittals to ensure that permits are issued in an expeditious manner.

  Accomplishment: All new users located in either district are expeditiously permitted prior to discharging into the NBC sewer system. Formal plan review meetings are conducted weekly by Pretreatment staff to ensure prompt response to user plan submittals and to expedite the permitting process. Permitting of various classes of non-significant users located in both districts was ongoing in 2016, as 388 Wastewater Discharge Permits were issued in various industrial and commercial categories. During the year, permits were issued to metal finishers, chemical manufacturers, restaurants, supermarkets, automotive repair shops, printers, photo processors, dental offices, doctor offices, and other medical facilities using x-ray equipment. Permitting of new users also continued during 2016, as 138 of the 388 permits were issued to new users. The majority of the new permits were issued to non-significant industrial and commercial users.

  The Pretreatment and Permits & Planning sections routinely perform expeditious reviews of discharge and sewer connection permit applications and work closely to ensure that contractors and users needs are promptly addressed. During 2016 the Pretreatment Section performed expeditious reviews of 239 process and pretreatment system plan submittals. Of these 239 plan submittals 148 were promptly approved, 39 were approved with conditions to be met, 18 were rejected since NBC requirements were not satisfied and no action was taken initially on 34 plans since additional information was required for approval.

  The Permits & Planning Section continued to meet its goal of responding to incomplete Sewer Connection Permit Applications within two business days and issuing permits within ten business days. During 2016, 270 Sewer Connection Permits were issued. Additional information regarding this program is provided in CHAPTER VII.

The Pretreatment and Permits & Planning sections track the number of business days from the time the application package is complete to issuance of the permit. In 2016 the average time for a new Wastewater Discharge Permit to be issued by the Pretreatment Section was 22 business days and the Permits Section issued new Sewer Connection Permits within two business days.

- **2016 Goal:** Identify new and previously unknown sewer users to ensure compliance with regulations. To achieve this goal, conduct spot inspections of industrial users located in 75% of the mill complexes/industrial areas situated within the two sewer districts to identify new and previously unknown sewer users.

  Accomplishment: The NBC instituted a program of performing unannounced inspections of mill complexes and industrial areas to identify facilities discharging without a permit. This program has been quite successful. In 2016, 41 of the 63 or 65.1% industrial areas and mill complexes were inspected at least once in 2016. This program of conducting unannounced inspections of industrial areas and mill complexes to locate new and previously operating unpermitted users has been quite successful at locating unpermitted users. In addition to performing mill complex inspections, Pretreatment staff routinely reviews newspapers, social media and directories to locate new and previously unknown sewer users. All of these methods were utilized during 2016.

- **2016 Goal:** Ensure the protection of the two NBC POTWs and Narragansett Bay to minimize incidents of pass through and interference.

  Accomplishment: Pretreatment staff promptly responds to all reports of unusual influent at each treatment plant, illegal dumping, spills, odors, and blockages. The reports can come from other NBC Sections, NBC computer monitoring systems, environmental agencies, fire departments and/or the general public. The purpose of these investigations is to find the source and protect the plants and infrastructure from upset. In 2016, Pretreatment staff conducted 21 investigations. To assist NBC staff in conducting these investigations, Spill Response and Tracking training is provided annually.

  Pretreatment and EMDA staff also respond to notifications from the NBC Laboratory Information Management System (LIMS) of incidents of non-compliance from NBC monitoring events. When notified by LIMS that a sample collected at an industry is out of compliance with NBC discharge limitations, EMDA staff immediately conducts resampling at the facility and Pretreatment staff contacts the facility to immediately begin resampling its effluent. When alerted by LIMS that the concentrations of pollutants in the influent or effluent of the treatment plants have exceeded preset concentrations, EMDA and Pretreatment staff work together to find the source. The activities that staff conducts include installing manhole samplers in key locations and inspecting all facilities in the district with the potential to impact the plant with the pollutant in question.

- **2016 Goal:** Continue regulatory inspections of Septage Haulers as part of the NBC Septage Discharge Control Program.

  Accomplishment: During 2016, Pretreatment staff verified the authenticity of 28 septic system pump-outs reported on manifest forms. In addition, Pretreatment staff conducted 15 inspections at the Septage Receiving Station during 2016. Additional information regarding the NBC Septage Discharge Control Program is provided in CHAPTER VII.

- **2016 Goal:** Improve Data Management.

  Accomplishment: During 2016, Permits & Planning staff continued to use a database which incorporates Google Maps. This database better tracks sewer connection permits. The database contains information including the name, address and type of connection (residential or commercial) and whether the connection is direct or indirect. Throughout 2016, Permits & Planning staff continued to use a new online application process which allows sewer connection permit applications to be completed, submitted and paid for online. A workstation was installed in the office where applicants can complete and submit applications electronically.

  The NBC GIS system was further refined to include additional attributes for the receiving water monitoring stations. All bay and river nutrients and bacteria monitoring sites have been entered and remain accurate. Throughout 2016 EMDA staff continued to maintain the "Snapshot of Upper Narragansett Bay" website which gives NBC staff and other interested parties immediate online access to NBC data. The 2005-2016 receiving water nutrient data was QA/QC reviewed and the existing spreadsheets were redesigned to make the data easier to interpret. Data processing for the vertical profiling performed in the Bay were also improved.

  In 2016, the NBC Laboratory relocated into a new building. The new Water Quality Science Quality Building is a state of the art laboratory facility. The building is equipped with computer controlled heating and cooling systems to ensure samples are kept at the proper temperatures as well as an advanced class 10,000 clean room. The class 10,000 clean room is used to process ultra low level metal samples and ultra low level mercury samples.

  Throughout 2016 IT staff continued to work on upgrading the Pretreatment software. The upgraded system was put online in November 2016. The upgrade increased functionality. Staff can now better track submittals of Certifications of No Discharge and Dental BMP Certifications, and access mapping applications. In addition the software will be available in the field via iPads. Pretreatment and IT staff will continue to work on additional enhancements throughout 2017.

  Throughout 2016, PP&R staff continued to use iPads. In mid-2013 iPads were purchased for all Pretreatment technical staff. Apps were downloaded on these

iPads that allow staff to use Microsoft Office software and upload documents to the NBC SharePoint system. During 2016 Pretreatment staff continued to use inspection checklists in the field. Permits & Planning staff continued to use iPads to upload permit information and pictures to the data base. Throughout 2016, EMDA staff conducted general troubleshooting activities involving the iPads to optimize functionality.

- **2016 Goal:** Provide training for OSHA and Safety Awareness. Provide all new applicable employees with 40-hr HAZWOPER training, conduct continuous in-house hazardous awareness training, and provide Infectious Materials Exposure Control training to pertinent NBC personnel.

  Accomplishment: All new employees hired in the Pretreatment, ESTA and EMDA Sections were given initial 40 hour HAZWOPER training. All NBC staff certified in 40 hour HAZWOPER training were given annual 8 hour refresher training which consisted of in-house training to satisfy the 8 hour refresher requirement.

  OSHA related training is given on Incident Command, Confined Space Entry, Hazard Communication, and Hazardous Waste Management. NBC continued to train employees on CPR/AED and First Aid and Hearing Conservation. Audiograms are given annually to NBC employees that have the potential to work in environments where hearing protection is needed. During 2016 NBC staff participated in OSHA classroom and hands-on sessions and had access to NBC University on-line safety training programs. Forty-seven individual health and safety training sessions were conducted.

- **2016 Goal:** Continue to document Pretreatment, EMDA and Laboratory Standard Operating Procedures and NBC Policies and Protocols manuals and update QA/QC programs. The purpose of these manuals is to clearly detail all standard operating procedures in the three sections. These manuals make invaluable reference tools for Pretreatment, EMDA and Laboratory staff and will provide a great resource for NBC employees working outside of these sections.

  Accomplishment: The Pretreatment Section has a Standard Operating Procedures (SOP) manual which consists of all existing SOPs. As existing procedures are reviewed and revised or new procedures are developed, they are documented in this manual. During 2016, Pretreatment staff continued to review SOPs and update them accordingly.

  During 2016, EMDA staff continued to detail all standard operating procedures and procedural changes for its section. Staff reviewed current literature to ensure any mandated changes in sampling protocols and/or methods were promptly adopted in NBC protocols and methods. All such changes are incorporated into the EMDA SOP manual. During 2016, SOPs were either updated or developed for Field's Point CSO tunnel effluent, influent, primary influent, primary effluent, final effluent and Bucklin Point aeration grab sampling and plant reuse water.

In 2016, the Laboratory SOP manual and QA/QC programs were updated. All new techniques and EPA methods were incorporated into the laboratory control documents.

During 2016, agency policies continued to be updated. All new policies are distributed to management and supervisory staff to be included in NBC Policy Manuals located throughout the agency. New policies are communicated to all NBC staff.

- **2016 Goal**: Provide free technical assistance.

  Accomplishment: Throughout 2016 ESTA staff continued to work with the industrial community to help reduce pollution at the source of generation. Activities include on-site pollution prevention and regulatory compliance technical assistance, measuring and monitoring water usage, providing assistance with water conservation projects, and collection and reporting of water use data elements. During 2016, 23 pollution prevention technical assistance site visits were conducted.

- **2016 Goal**: Water Conservation and Reuse.

  Accomplishment: ESTA staff continued to investigate opportunities for the reuse of treated wastewater from the two treatment plants. Throughout 2016 ESTA staff continued to research U.S. water reuse regulations and requirements, met with representatives from DEM to discuss on-site water reuse opportunities and initiated a plant water sample collection and analysis program.

- **2016 Goal:** Environmental Merit Awards Program - Solicit nominations from companies and staff, evaluate all Significant Industrial User performance data, and hold Awards Ceremony.

  Accomplishment: In 2016, the NBC recognized one company for environmental achievements with regards to storm water management, and nineteen SIUs for achieving 100% compliance with all NBC regulatory requirements. The awards were presented to the organizations at a breakfast meeting held on April 5, 2016. Additional information regarding this program is provided in CHAPTER VII.

- **2016 Goal**: Workshops – Participate in workshops and conferences to educate the public on NBC programs and initiatives.

  Accomplishment: During 2016, PP&R staff made numerous presentations at workshops, meetings and/or conferences. These conferences include the 2016 National Association of Clean Water Agencies Pretreatment & Pollution Prevention Workshop, 2016 EPA New England Region Pretreatment Conference, and the 2016 NEWEA Conference. Further discussions on the workshops and other NBC educational efforts can be found in CHAPTER II.

- **2016 Goal:** Energy Management– Continue to investigate energy conservation and alternative energy opportunities, Monitor measure and report NBC renewable energy generation, participate in the USDOE Better Plants Program and seek grant funding for energy projects.

  Accomplishment: Throughout 2016 ESTA staff continued to track annual energy use measurements from various NBC metered accounts and assessed performance data using EPA Portfolio Manager. NBC continued with efforts to measure the output of three 1.5 MW wind turbines at Field's Point and assisted with the development a 600 kW biogas combined heat and power system at Bucklin Point and a 10 MW net metered solar energy project. In 2016 the NBC purchased three 1.5 MV off-site wind turbines that are remotely net metering renewable electricity to various NBC electrical accounts. In addition the NBC replaced all existing light fixtures with low energy demand LED lighting. ESTA staff continues to participate in the USDOE Better Plants Program. ESTA continues to actively research grant opportunities through the RIOER and various National Grid rebate programs.

- **2016 Goal**: Assess NBC Greenhouse Gas Emissions – research regulations and guidance documents, refine GHG inventory and assess process emissions.

  Accomplishment: Throughout 2016, NBC continued to collect and analyze electrical, natural gas, biogas and vehicle fuel use to support operations and to help quantify GHG emissions for Field's Point and Bucklin Point. NBC site specific and overall GHG emissions remain below current reporting requirements for both State of Rhode Island and EPA. During 2016, NBC conducted a study, in cooperation with the University of Rhode Island, to quantify nitrous oxide, carbon dioxide and methane emissions from the Field's Point treatment processes. ESTA staff reviewed URI results and commented on publications and documents. NBC staff participated in public meetings fo the RI Executive Climate Change Coordinating Council (EC4) and initiated the development of an annual Sustainability Report that will quantify NBC current GHG inventory.

- **2016 Goal:** Evaluate environmental sustainability opportunities at the treatment facilities.

  Accomplishment: Throughout 2016, ESTA staff continued to review and analyze data collected from past glycerin pilot studies and coordinated efforts with a local biodiesel manufacturer to investigate using grease collected at Field's Point to produce biodiesel fuel. ESTA continued to assess and quantify biogas production at Bucklin Point.

- **2016 Goal:** Conduct weekly manhole monitoring in both districts to ensure user compliance with NBC discharge limitations and to determine the location of previously unknown and unpermitted users. Attempt to sample 6 to 10 manholes per week.

  Accomplishment: EMDA staff conducted weekly manhole monitoring throughout both NBC drainage districts. This monitoring program consists of installing ISCO automatic samplers in surveillance manholes located upstream and downstream of users on a weekly basis to verify users' compliance status. EMDA staff successfully sampled 290 industrial surveillance manholes during 2016, 125 in the Bucklin Point district and 165 in the Field's Point district. In addition to the 290 industrial manholes, EMDA collected samples from 46 sanitary manholes.

  The EMDA Section also attempted to collect samples from 16 additional manholes. However, samples could not be collected due to no flow in the sewer line at the time manhole sampling was conducted or due to sampling equipment malfunction. This is an average of approximately six manholes per week, meeting the goal of 6 to 10 manholes per week. During 2016, 336 manholes were sampled. This is a slight increase of 2.1% or 7 manholes, when compared to the 329 manholes sampled in 2015. During 2016 surveillance manhole monitoring was conducted up and down stream of 78.6% of the SIUs.

- **2016 Goal:** Define the sewer system sampling program to assess loadings from key drainage areas to locate potential areas of concern and drainage area loadings.

  Accomplishment: As in past years, the NBC once again performed well towards satisfying this goal, as it defined strategic manholes throughout both sampling districts, formulated a sampling schedule and conducted routine monitoring of these manholes to evaluate loadings. Flow proportioned sampling of drainage basins as well as analysis of storm water inputs, water supply inputs and sanitary sewers were used to budget inputs and improve the NBC manhole sampling program. A layer on the GIS maps was created in 2013 and used throughout 2016 to graphically depict results of drainage district sampling results in order to make interpretation of the data easier.

  EMDA continued background monitoring of residential areas to better define loadings to the treatment plants. An additional goal to monitor residential sources of pollutants to determine background loading was also satisfied, as 46 sampling events of residential manholes were conducted during 2016.

  During 2015 NBC designed a potable water study to determine background sources of contaminants originating from drinking water supply systems. This study was further refined during 2016 and is nearly ready for implementation. The study performed in 2000 was evaluated and used as a basis to design an improved study. Sampling is scheduled to begin in early 2017.

- **2016 Goal:** Sample at the two NBC POTWs daily for all RIPDES permitted parameters. Research and test new sampling equipment and procedures to continually improve monitoring activities.

Accomplishment: EMDA staff used clean sampling techniques for all industrial monitoring and treatment plant sampling for metals, cyanide and nutrients conducted in 2016. Throughout 2016, EMDA staff continued to use QA/QC sample collection practices to ensure the highest quality samples were being collected. During 2016, the NBC complied with the RIPDES permit requirements to sample at the two treatment plants every day of the year and met all mandated reporting requirements. EMDA staff continued to sample all process operations at both plants to acquire the data needed to optimize plant performance. During 2016, an upgraded sampler was installed at the Field's Point BNR system. An ISCO 5800 sampler replaced an ISCO model 3700.

- **2016 Goal:** To review, evaluate and log all analytical data obtained from EMDA monitoring efforts, to provide interpretation of this information to appropriate NBC staff in a timely manner and to ensure that quality assurance and quality control procedures are maintained.

Accomplishment: During 2016, EMDA continued to evaluate all monitoring data. Both in monthly interdepartmental data meetings and in comprehensive monthly reports, short and long term trends and alerts to high levels were provided. Data was posted on the NBC webpage "Snapshot of Upper Narragansett Bay" along with blogs interpreting the most recent data. During 2016, EMDA published the data collected from the 2015 monitoring season. During 2016, EMDA continued to work closely with the Laboratory staff regarding LIMS issues, as well as with IT personnel to review existing databases to identify areas of improvement. EMDA maintained a log in which any information impacting analytical results such as changes in detection limits or process changes within the treatment plants, was entered. This allows successors to determine what occurred when analytical trends or data differ from historical values.

EMDA staff analyzes the data on a regular basis to establish trends and notify Operations, Interceptor Maintenance and/or Pretreatment staff of any anomalies. EMDA staff conducts monthly meetings to report the data trends. Pretreatment, Laboratory, ESTA and Operations staff from both facilities routinely attend these meetings. During 2016, the Snapshot webpage received minor updates and it was maintained with regular data analysis blogs and the latest bay monitoring data so it can be quickly available on-line to NBC staff and the general public.

Throughout 2016, Pretreatment staff continued to work with IT staff on the PT-LIMS interface to download data directly from LIMS to Pretreatment System.

- **2016 Goal:** Monitor the receiving waters of both the Field's Point and Bucklin Point treatment facilities with the fixed site monitoring equipment.

Accomplishment: In 2016, the NBC continued to monitor the receiving waters of both the Field's Point and Bucklin Point treatment facilities at two fixed sites within the Providence and Seekonk Rivers. Continuous online monitoring is conducted for dissolved oxygen, conductivity, temperature, salinity, pH, chlorophyll, pressure (depth) and tidal amplitude. In addition, weekly samples at these and other upper bay stations were collected for fecal coliform, nutrient analyses, chlorophyll-a and turbidity. EMDA staff maintained the sites at Bullocks Reach, a buoy site, and Phillipsdale Landing, a dock site. Quality assurance practices continued to be coordinated with the Narragansett Bay Fixed Site Water Quality Monitoring Network, a state of Rhode Island monitoring collaborative, that has adopted common methods for this baseline assessment. This data is made available to the scientific and general community on a real time basis on the NBC "Snapshot of Upper Narragansett Bay" webpage.

- **2016 Goal**: Conduct tributary river sampling for fecal coliform analysis

Accomplishment: In 2016 EMDA continued to sample twenty locations along five rivers in the Providence metropolitan area: the Woonasquatucket, Providence, West, Blackstone and Moshassuck Rivers. Two sampling sites along the Moshassuck River were abandoned during 2016 due to safety concerns and two new replacement sites were added in their place. The new sites are in the same general area as the abandoned ones but can be accessed more safely. Weekly sampling of these twenty sites has allowed EMDA to promptly notify the NBC Interceptor Maintenance (IM) section of both dry and wet weather discharges based on the analytical results, and has been a key technique for pinpointing overflow and interceptor malfunctions. The results of the tributary river monitoring for fecal coliform bacteria is provided to IM staff twice-weekly and is used to locate possible maintenance problems. Many fewer wet weather discharges are expected now that Phase II of the CSO Abatement Project has been completed. However, dry weather overflows can occur periodically and are usually the result of blockages in sewer regulators. EMDA scientists also analyze the data to determine trends in fecal coliform bacteria inputs to these waterways. Trend analyses are conducted and reported to NBC staff on a monthly basis through monthly reports and periodic meetings. River sampling data routinely assist IM in identifying and quickly stopping dry weather overflows. This data has provided a baseline to measure the success of the CSO remediation project, and data collected throughout 2016 in conjunction with data collected in future years will be used to evaluate the success of Phase II of the NBC CSO projects in reducing adverse impacts to area tributary rivers and Narragansett Bay.

- **2016 Goal**: Continue to evaluate the effect of the NBC effluent on water quality of the receiving waters.

  Accomplishment: During 2016 EMDA continued water quality evaluations of the receiving waters of the Bucklin Point and Field's Point wastewater treatment facilities. The purpose of this monitoring initiative is to determine the distribution and concentration of contaminants of concern to the health of the environment in both the Seekonk and Providence Rivers. EMDA continued its fecal coliform and nutrients monitoring by boat at multiple stations in the Providence and Seekonk Rivers, as well as continuing bacteria monitoring weekly at multiple stations in four freshwater rivers that are affected by combined sewer overflows. In 2005 EMDA began initial tests for Enterococci bacteria. This testing was expanded in 2006 in river, bay and treatment plant effluent samples in order to assess water quality with the new primary contact standard for fresh and saltwater. This testing continued throughout 2016. In addition, during 2016, EMDA continued the use of an underwater video camera to determine the state of the benthos in NBC receiving waters. Long-term monitoring of the benthos will document how BNR impacts the local benthos.

- **2016 Goal:** Conduct Toxics Compliance Monitoring of two CSO wet weather event discharges as a part of the NBC Nine Minimum Controls Program.

  Accomplishment: To evaluate the effectiveness of the Pretreatment and Pollution Prevention programs at reducing toxic pollutant discharges through CSOs, EMDA monitors several CSOs annually as an element of the NBC Nine Minimum Controls Program. The aim of wet weather sampling events is to characterize the impact of CSO discharges and the efficacy of NBC's current controls when wastewater overflows the collection system during wet weather events. The sampling plan was designed so that three samples are to be collected at the outfall throughout the overflow event. The first sample is to be collected during the initial overflow stage, or first flush, and typically contains wastewater with the least degree of rain water dilution and the highest concentrations of pollutants washed from street and land surfaces into the combined sewer system. A second sample is to be collected of the flow occurring midway through the storm event and a third sample collected near the conclusion of the event. CSO sampling was conducted at two Pawtucket CSO locations during 2016, one located on Moshassuck Street, and the other was at Bucklin Brook. The Moshassuck Street sampling included all three phases while the Bucklin Brook only consisted of the first two phases of the event.

- **2016 Goal:** Conduct border river sampling for nutrient analysis to determine loadings to Upper Narragansett Bay that originate from outside of Rhode Island.

  Accomplishment: This monitoring initiative was begun in 2007 and continued in 2016. This monitoring consists of monthly sampling from the mouths of the Ten Mile, Runnins, Palmer, Warren Reservoir, Cole, and Taunton rivers, as well as from multiple sites on the Blackstone River. In addition, a sample is collected monthly from the mouth of the Pawtuxet River to provide more accurate data on all sources of nutrient loadings to Upper Narragansett Bay. The data shows NBC contributions are not as large a percent loading as first thought. This monitoring has revealed that nutrients loadings to the Bay dramatically increase during rain events.

- **2016 Goal:** Evaluate water quality inside the Providence River Hurricane Barrier to generate a long term data set necessary to measure the success of the CSO abatement project.

  Accomplishment: In 2007, as part of its monitoring plan EMDA began an initiative to sample tributary rivers and/or the upper bay in response to extreme situations or weather conditions that have the potential to adversely affect plant operations and/or receiving water quality. During the latter portion of 2007, EMDA began monitoring within the hurricane barrier for Total Dissolved Oxygen (DO) on a monthly basis. Since this is a low flush area due to the river being partially blocked by the hurricane barrier, it is expected CSO discharges will have a magnified impact on DO levels compared to higher flush areas. Conversely, it is expected that the CSO tunnel will result in fewer oxygen depleting CSOs and have a positive impact on DO levels. EMDA continued to sample multiple locations in the urban rivers and Bay for bacteria and dissolved oxygen before and after rain events. This data has provided a baseline to measure the success of the CSO remediation project. This monitoring continued in 2016. Data collected from these locations is used to evaluate the tunnel's success in reducing adverse impacts to area tributary rivers.

- **2016 Goal:** Continually improve NBC monitoring and analytical capabilities.

  Accomplishment: In 2007, EMDA began replacing antiquated refrigerated automatic samplers located with the treatment plants with sophisticated state-of-the-art samplers requiring much less human intervention. The samplers hold up to four carboys, eliminating the need for off-hour jug change-outs. During 2016, an upgraded sampler was installed at the Field's Point BNR system. An ISCO 5800 sampler replaced with an ISCO model 3700. The new sampler is equipped with back-up battery power which will allow the samplers to operate in the event of a power interruption.

  Throughout 2016 Laboratory staff continued to improve the turn around of lab data with the use of a new Laboratory Information Management System (LIMS) which was purchased in 2016. In addition, the lab continued to improve test methods and instrument confidence with the use of high quality laboratory equipment. The Laboratory successfully passed an EPA audit and received certification for all testing in the new Water Quality Science Building.

- **2016 Goal:** Participate in community based environmental and educational projects.

  Accomplishment: In 2016, the NBC continued the Earth Day Environmental Grant Program providing small Earth Day clean-up grants to organizations in the NBC service area. Woonasquatucket River. The grant program assisted numerous local organizations, cities and towns by providing 21 small grants totaling $11,000 that allowed these organizations to purchase supplies to organize clean up events and river restoration activities in their communities.

  During 2016, PP&R staff participated in the NBC Watershed Explorers Program, reaching over 700 school students.

- **2016 Goal:** Conduct studies during extreme weather or emergency events.

  Accomplishment: In 2007, as part of its monitoring plan EMDA began an initiative to sample tributary rivers and/or the upper bay in response to extreme situations or weather conditions that have the potential to adversely affect plant operations and/or receiving water quality. The NBC is prepared to immediately undertake any monitoring necessary to evaluate the impacts from this type of event.

  In October 2016, the NBC assisted the DEM with the collection of phytoplankton samples to evaluate for the presence of a harmful alga known as pseudo-nitzschia. The presence of this toxic phytoplankton resulted in an emergency closure of all shell fishing beds in the bay during the month. Assistance was given in the form of boat time over the course of two days in late October for the continuation of monitoring efforts by DEM to assessthe abundance of this plankton.

- **2016 Goal:** Improve process operations at the two treatment plants.

  Accomplishment: During 2016, EMDA continued the process control sampling at Field's Point to support the BNR process to ensure the upgraded treatment facility would be able to achieve the required level of performance. EMDA also continued the activated sludge sampling program to better understand the biosolids flow distribution in the treatment systems. This monitoring consisted of grab sample collections from each of the aeration tanks twice per week in order to ensure an even distribution of biosolids in the reactors.

  During 2016, EMDA assisted to optimize the treatment process at Bucklin Point by continuing a program to evaluate characteristics of the new side stream equalization process. This process collects various side stream flows from the plant, equalizes them and allows them to be fed back to the treatment process in a controlled manner. This sampling is performed three times per week. The data is

compared to other process control sampling and is used to optimize the treatment process. In addition, several adjustments to the sampling of Bucklin Point's mixed liquor were implemented including a slight shift in the sampling location and modification to the program used by the sampling machine. These changes were implemented to collect more representative samples. In addition a daily grab sample was also added. The results of the composite sample, the grab sample, and the results from a continuous probe are compared against each other on a daily basis.

- **2016 Goal:** Provide access to all NBC monitoring data.

  Accomplishment: EMDA staff analyzes the data on a regular basis to establish trends and notify Operations, Interceptor Maintenance and/or Pretreatment staff of any anomalies. EMDA staff conducts monthly meetings to report the data trends. Pretreatment, Laboratory, ESTA and Operations staff from both facilities routinely attend these meetings. EMDA completed and posted its annual data report to www.narrabay.com during 2016. This data is invaluable to all stakeholders involved with Narragansett Bay. Data summary reports were also posted to the NBC "Snapshot of Upper Narragansett Bay" webpage on a weekly or biweekly basis, presenting current data trends and water quality conditions on the bay.

- **2016 Goal:** Implement flow monitoring of rivers not presently on the USGS Streams Gauge Network.

  Accomplishment: In early spring 2016, EMDA staff conducted flow monitoring activities on the Moshassuck River at the Mill Street foot bridge. A Global Flow probe model FP101 was used to acquire velocity measurements for each of 10 cross-sectional segments. The depth was also recorded at each segment. Using the data gathered, flow was calculated to be 28.81 ft^3/s. Flow measurements allow NBC to calculate loadings using analytical data.

- **2016 Goal**: Participate in a study to evaluate emerging pollutants in the NBC receiving waters.

  Accomplishment: In 2014, the NBC worked with the EPA Atlantic Ecology Lab collecting treatment plant effluent samples for emerging pollutant analysis. An informational meeting was planned for 2016 to discuss further collaboration, but did not occur. In October 2016, NBC was contacted to by Dr. Rainer Lohmann of URI regarding emerging pollutants research he is conducting at URI. NBC is awaiting a proposal but has agreed to participate on a limited basis to assist with deployment/recovery of his sampling devices along the EMDA established sampling routes.

Major Program Goals for 2017

Goal Category	Goal Outline	Goal Description
Inspections	Inspect industries to ensure compliance with regulations.	▪ Inspect each SIU twice (EPA/RIDEM requires one inspection) ▪ Inspect each non-significant industrial user once ▪ Inspect 75% of permitted restaurant and food processing facilities ▪ Biannual inspections of all other permitted commercial users
	Identify new and previously unknown sewer users to ensure compliance with regulations.	▪ Conduct unannounced inspections of 75% of the mill complexes/industrial areas
	Continue regulatory inspections of septage haulers.	▪ Inspect septage vehicles at the receiving station one day per month ▪ Staff will verify at least 12 septage manifest forms per year
Emergency Response Actions	Ensure protection of the two POTWs and Narragansett Bay to minimize incidents of pass through and interference.	▪ Respond to 100% of unusual influent reports ▪ Respond to 100% of reports of illegal dumping, spills and blockages ▪ Investigate all automatic notifications from LIMS of incidents of non-compliance ▪ Investigate all reports of unusual influent as indicated through the PI computer monitoring systems ▪ Conduct annual Spill Response and Tracking training
Pollution Prevention and Technical Assistance Initiatives	Provide free technical assistance.	▪ Reply to all request to 100% of all requests for technical assistance ▪ Seek grant funds to support technical assistance programs
Monitoring and Analytical Initiatives	Sample industrial discharges to sewer system to ensure compliance with regulations.	▪ Conduct sampling of each SIU twice (EPA/DEM requires one sampling) ▪ Resample any SIU found out of compliance
	Conduct sampling to assess loadings from key drainage areas and determine background loadings of pollutants.	▪ Conduct routine residential manhole monitoring ▪ Continue monitoring of residential sources of pollutants to better define background loading ▪ Replicate previously performed potable water study
	Conduct surveillance monitoring in the sewer system to ensure compliance with regulations.	▪ Sample 6-10 manholes per week (including surveillance and routine monitoring) ▪ Sample up and down stream of 70% SIU and Zero Discharge Company at least once
	Monitor Field's Point and Bucklin Point facilities as necessary to ensure and improve compliance with all RIPDES permit requirements.	▪ Sample both wastewater treatment facilities daily ▪ Collect process control samples to provide critical plant operational data to allow Operations staff to optimize plant performance ▪ Research and test new sampling, data scanning and recording equipment and procedures to continually improve monitoring activities ▪ Collect samples to test functionality and optimize BNR facilities

Goal Category	Goal Outline	Goal Description
Monitoring and Analytical Initiatives (continued)	Maintain the two NBC fixed site monitoring systems to evaluate NBC receiving water quality	▪ Maintain the two fixed site stations to continue monitoring downstream of each plant ▪ Deploy a special buoy to evaluate water quality conditions in a dissolved oxygen impaired area of the upper bay ▪ Monitor continuously for temperature, salinity, dissolved oxygen, conductivity, pH, chlorophyll and pressure (depth) ▪ Collect bi-weekly samples at these monitoring stations for fecal coliform, nutrients, chlorophyll-a, and turbidity analysis ▪ Provide data and data interpretation to the scientific and general community on a real time basis. ▪ Continue participation in the Bay Wide Fixed Site Network monitoring collaborative using approved QA/QC protocols
	Continue to monitor NBC receiving waters to evaluate water quality improvements, areas with impairments and causes.	▪ Continue routine monitoring program of the Providence and Seekonk Rivers for nutrients, bacteria, dissolved oxygen and other parameters ▪ Perform additional monitoring in response to extreme situations or weather conditions that could adversely affect plant operations and receiving water quality ▪ Perform benthos monitoring to determine how nitrogen loading reductions impact local benthos
	Conduct tributary river sampling for fecal coliform analysis to ensure compliance with EPA Nine Minimum CSO Control Program	▪ Conduct weekly sampling at multiple sites on the West, Woonasquatucket, Moshassuck and Blackstone Rivers and one site on the Providence River ▪ Provide data to IM staff to allow for timely maintenance activities of the CSOs ▪ Conduct monitoring of CSO events by collecting samples at the first flushmid-storm and late storm flow to characterize the CSO discharge impact and efficiency of CSO controls in place ▪ Conduct toxics compliance monitoring at three locations, two CSOs and the North Diversion Structure at Bucklin Point, during wet weather event discharges
	Border river sampling for nutrient analysis to determine loadings to Upper Narragansett Bay that originate from outside of Rhode Island	▪ Conduct monthly sampling from the mouths of the Ten Mile, Runnins, Palmer, Warren Reservoir, Cole, and Taunton rivers as well as from the Blackstone River where they cross the State line
	Conduct sampling to measure the success of Phases II of the NBC CSO Abatement program	▪ Conduct sampling at multiple locations in the rivers and bay for bacteria before and after rain events to evaluate the success of the CSO abatement tunnel project.
	Conduct periodic monitoring of storm sewer discharges	▪ Conduct monitoring of at least two storm sewer discharages annually, one from each sewer district

Goal Category	Goal Outline	Goal Description
Monitoring and Analytical Initiatives (continued)	Continually improve NBC monitoring and analytical capabilities	▪ Upgrade existing plant samplers as needed to improve monitoring capabilities ▪ Install video cameras at all RIPDES sample locations to monitor and record all activities ▪ Automate temperature monitoring, recording, and notification of staff of system failures at all automatic samplers ▪ Implement periodic flow monitoring of rivers not presently on the USGS Streams Gauge Network ▪ Attain 100% accuracy on all annual proficiency testing and perform routine internal proficiency testing ▪ Ensure all laboratory equipment is calibrated annually ▪ Maintain all Laboratory licensing certifications
Permitting	Expeditious review and issuance of permits	▪ Respond to all incomplete discharge permit applications and renewals within fourteen business days ▪ Review submitted Pretreatment facility plans on a weekly basis ▪ Respond to all incomplete Sewer Connection Permit applications within two business days. ▪ Issue Sewer Connection Program permits within 10 business days
Data Logging Analysis and Reporting	Continue to expand and improve electronic data systems	▪ Improve and expand existing databases ▪ Document all treatment facility process and laboratory changes in meta-data files ▪ Continue to create LIMS reports to migrate data automatically into spreadsheets ▪ Upload river and bay data weekly to Snapshot, the NBC water quality website, for immediate staff and stakeholder access ▪ Continue to computerize past analytical data ▪ Continue to scan DMRs into electronic format
	Provide internal and external access to appropriate NBC monitoring data	▪ Upload annual data report to the internet by April 30th ▪ Promptly prepare updates detailing activities and historical trends to Snapshot ▪ Provide external access to appropriate data via Snapshot ▪ Provide access to NBC staff to all data via LIMS ▪ Provide NBC data in response to specific requests
	Review, evaluate, report and present NBC data to internal and external stakeholders	▪ Prompt data logging and evaluation ▪ Analyze data and report projected short and long term trends via monthly reports and meetings ▪ Timely response on data excursions and alerts to Laboratory, Operations and Pretreatment staff, allowing opportunity for prompt corrective action ▪ Provide trend analysis to NBC and Stakeholders ▪ Publish technical papers, abstracts and present posters ▪ Prepare draft press releases on findings

Goal Category	Goal Outline	Goal Description
Special Studies and Projects	Improve functionality of NBC computer systems	▪ Continue to locate sewer connections, LID projects, industrial and commercial users, and private pump stations in the NBC Permits software system ▪ Continue to locate and update users and surveillance manholes on the computerized maps ▪ Continue to locate and update all monitoring locations on the NBC GIS system ▪ Begin to use GIS/LIMS tools to incorporate sample locations into LIMS ▪ Improve the information on the NBC internet sites ▪ Continue to improve safety training tracking software
	Energy Management	▪ Continue to investigate energy conservation and alternative energy opportunities ▪ Monitor, measure and report NBC renewable energy generation ▪ Continue to participate in US Department of Energy Better Plant Program ▪ Continue to oversee wind energy projects ▪ Oversee solar PV project implementation ▪ Seek grant funding for energy projects
	Water Conservation and Reuse Projects	▪ Continue to investigate WWTF reuse of wastewater and biosolids ▪ Seek grant funds to support water conservation and reuse programs
	Evaluate environmental sustainability opportunities at the treatment facilities	▪ Coordinate research to increase bio-gas production at Bucklin Point
	Participate in community based environmental and educational projects	▪ Continue Earth Day Grant Program ▪ Participate in the NBC Watershed Explores Program ▪ Participate in statewide environmental stakeholder groups, such as Watershed Counts, RI Monitoring Collaborative, etc.
	Assess NBC Greenhouse Gas Emissions (GHG)	▪ Continue to review and document applicable state and federal GHG regulations ▪ Continue to review and document applicable GHG guidance documents ▪ Continue to refine inventory of NBC GHG sources ▪ Assess actual NBC GHG process emissions
	Storm Water Mitigation Projects	▪ Continue to update and maintain the Storm Water Management Plans (SWMP) for both treatment plants ▪ Conduct site inspections of both plants in accordance with the SWMPs ▪ Conduct sampling in accordance with the SWMPs ▪ Provide annual training on the SWMP to plant employees ▪ Assess internal and external construction projects to ensure compliance with NBC Storm Water Management Plan requirements

Goal Category	Goal Outline	Goal Description
Internal Procedures	Document all Standard Operating Procedures and Protocols	▪ Continue to detail all Pretreatment, EMDA, and Laboratory standard operating procedures and procedural changes for the three sections. ▪ Document all NBC policies in the NBC Policy Manual ▪ Periodically review and update all Section NBC Policy Manuals for completeness and accuracy
Education, Training and Public Awareness	Publish Annual Pretreatment Report	▪ Prepare and submit the Annual Pretreatment Report to DEM by March 15th ▪ Upload the Annual Report to the internet by April 15th ▪ Present the findings of the annual Pretreatment report to the Citizen's Advisory Committee
	Environmental Merit Awards Program	▪ Solicit nominations from companies and staff ▪ Evaluate all nominations and issue Pollution Prevention Awards if appropriate ▪ Evaluate all SIU performance data for perfect compliance ▪ Evaluate sewer connection projects using LID storm water mitigation technologies and issue an award for Excellence in Storm Water Management
	Workshops	▪ Participate in at least two public workshops ▪ Present an update on the NBC environmental initiatives, water quality improvements, and the health of upper Narragansett Bay at a workshop ▪ Conduct one workshop explaining NBC permitting requirements to public officials
	Provide training programs necessary to ensure employee Health and Safety.	▪ Provide all new applicable Pretreatment and EMDA employees with 40-hr HAZWOPER training ▪ Provide 8 hr. HAZWOPER Refresher training annually for all applicable employees ▪ Conduct continuous in-house hazardous awareness training ▪ Provide safety training to all new employees ▪ Provide OSHA required training programs necessary to protect employees such as hearing conservation, confined space entry, safety awareness, etc.
	Improve information on www.narrabay.com, the NBC internet site	▪ Ensure all documents from the older version of narrabay.com have been uploaded to the upgraded site. ▪ Update all information on the site to ensure its accuracy. ▪ Create informational fact sheets to be uploaded to the website. ▪ Continue to promptly update, improve and expand Snapshot, the NBC water quality website. ▪ Upload new presentations and fact sheets about NBC initiatives and water quality improvements to the website