

PRETREATMENT PROGRAM

ANNUAL REPORT

JANUARY 1, 2019 - DECEMBER 31, 2019



FIELD'S POINT AND BUCKLIN POINT DISTRICTS

MARCH 15, 2020

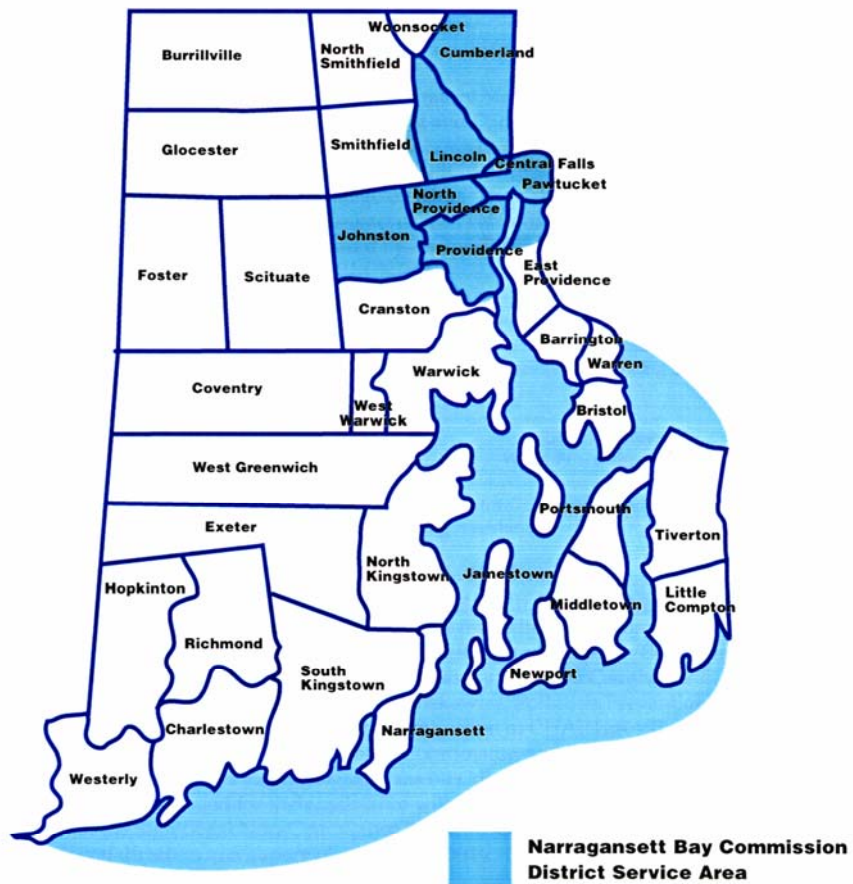
***Narragansett Bay Commission
Mission Statement:***

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.



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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 8,470 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 2019 had an average daily flow to the facility of 46.6 MGD.

The NBC installed three 1.5 megawatt (MW) industrial grade wind turbines at the Field's Point plant in 2012. Due to the success of these three wind turbines, the NBC purchased three additional wind turbines located in Coventry, Rhode Island. To advance further toward the goal of net-zero sustainable energy, in 2017 the NBC contracted to obtain electricity from several photovoltaic (PV) farms located in Richmond, RI. In 2019, approximately 76% of electricity used by the NBC came from these wind and solar energy services. In addition, the NBC has been building a combined heat and power generating system that will be powered by biogas generated from our sludge at the Bucklin Point facility blended with natural gas. This facility is expected to become operational in 2020, and will provide approximately 36% of the facility's power needs. The new system will provide 22% of the facility power needs on a renewable basis which equates to 7.5% of NBC average use. Additional information on the NBC energy projects 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 nitrogen limitation of 5.0 ppm. This seasonal limit became effective in May 2014 and was maintained in the RIPDES permit that became effective on December 1, 2017. The ten existing secondary treatment aeration tanks were converted to Integrated Fixed Film 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 2019 nitrogen load to the Providence River decreased by 84% from 2003 loading levels, the year of the historic Greenwich Bay fish kill. Throughout the 2019 permit season, Field's Point met the seasonal summer total nitrogen permit limits of 5.0 ppm and the loading limit of 2,711 pounds per day, averaging a seasonal discharge concentration of 2.7 ppm and 1,005 pounds per day. The annual average total nitrogen discharged from Field's Point was 4.9 ppm and 2,052 pounds per day in 2019.



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 22.8 MGD in 2019.

During 2006 the Bucklin Point plant completed a series of facility upgrades. A wet weather treatment facility was built that significantly reduced wet 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 required to comply with the seasonal total nitrogen limitation of 5.0 ppm beginning in May 2014. The 2019 seasonal nitrogen loading from this facility to Narragansett Bay was reduced by 82% from 2003 loading levels, the year of the Greenwich Bay fish kill.



Bucklin Point Wastewater Treatment

Throughout the 2019 permit season, Bucklin Point did well to meet the total nitrogen limits of 5.0 ppm and 1,293 pounds per day. The average total nitrogen discharged from May through October was 3.3 ppm and 529 pounds per day. The annual average total nitrogen discharged from Bucklin Point was 4.0 ppm and 740 pounds per day in 2019.

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 2019, including a list of new significant industrial users and a section regarding firms that experienced major changes in water usage in 2019. 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 4, 5, 6, and 7, 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 (EM), Technical Analysis & Compliance (TAC), 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 2019, Pretreatment staff issued 439 permits to users located in the Field's Point and Bucklin Point Districts, conducted 1,834 facility inspections, held 37 regulatory compliance meetings with users and responded to 25 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 2019, the NBC conducted 153 sampling inspections, performed 289 manhole sampling events, and reviewed 2,294 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 decreased during 2019 by 2,400.5 pounds, or 10.4% when compared to 2018. The total metals loading to Bucklin Point increased by 948.6 pounds, or 9.7% when compared to 2018. The cyanide loading to Field's Point decreased by 1,059.6 pounds, or 50.0% in 2019, and the cyanide loading to Bucklin Point decreased by 90.1 pounds or 18.1%. 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 2019, the NBC issued 1,629 Notice of Violation letters and two Administrative Orders. 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 Environmental Science & Compliance Division of the Narragansett Bay Commission. A description of the NBC approach to the EPA Dental Rule (40CFR441) can be found in this chapter.

CHAPTER VIII reviews the status of the goals established by the Pretreatment, EM, TAC, and Laboratory Sections for 2019 and describes the ambitious goals established by these sections for 2019.

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, 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
- Dental Amalgam 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 Watershed Explorers Program
- River Restoration Initiative
- Energy Management Program including alternative energy evaluations
- Sustainable Energy Management at 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 EM 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 removal unit 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 (SNC)
- 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, TAC, EM, 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 TAC 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, EM, Lab, and TAC 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

2019 Accomplishments

~ Permitting:

- 439 Permits issued
- 141 New permits issued to previously unpermitted firms
- 298 Revised permits issued

~ Inspections and Sampling:

- 1,834 Non-sampling Inspections conducted
- 264 Non-sampling Inspections of SIUs
- 173 Non-sampling Inspections of Categorical Users
- 91 Non-sampling Inspections of Significant Non-Categorical Users
- 1,510 Non-sampling Inspections of Non-Significant Users
- 37 Regulatory Compliance Meetings held with Users
- Pretreatment staff reviewed 2,294 User Monitoring Reports
- 25 Emergency/Special Investigations conducted
- 161 User Monitoring Reports generated by NBC
- 153 NBC Sampling Inspections of Industry

- 72 Different Facilities Sampled by NBC
- 148 Monitoring Reports of SIUs generated
- 92 Monitoring Reports of Categorical Users generated
- 56 Monitoring Reports of Significant Non-Categorical Users generated
- 13 Monitoring Reports of Non-Significant Users generated
- 289 Manhole Sampling Events conducted
- 240 Industrial Surveillance Manhole Sampling Events conducted
- 36 Sanitary Manhole Sampling Events conducted

~ **Enforcement:**

- 1,629 NOV Letters Issued
- 9 Firms listed in the February 27, 2020 Public Notice in the Providence Journal as being in Significant Non-Compliance (SNC)
- All but one of the 9 firms listed in SNC achieved full compliance with cited violations prior to publication of the Public Notice

~ **User Compliance:**

- 2.9% Rate of SIU SNC in the Field's Point district for 2019, a reduction from 39% in 1992
- Rate of SIU SNC reduced in Bucklin Point from 44.8% in 1994 to 5.9% for 2019
- Overall rate of SIU SNC is 4.4% in 2019
- 94.9% Overall Rate of Compliance for All Significant Users
- 97.7% Overall Rate of Compliance for All Categorical Users
- 93.2% Overall Rate of Compliance for All Non-Significant Users
- 94.0% Overall Rate of Compliance for All Users
- 68.3% of EPA categorically regulated users had perfect effluent compliance records with all effluent parameters excluding pH
- 69.7% of Significant Users AND 87.5% 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 2019, three users were reclassified from significant to non-significant. One of the three users that were reclassified was a categorical user. This user ceased discharging all process wastewater to the sewer. The other two users were non-categorical. Both generated wastewater from short term dewatering projects. Two users were located in the Field's Point district and eliminated 22,000 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 831 gallons per day of industrial flow to the Bucklin Point facility.

In 2019, there were two new SIUs, both were located in the Field's Point district and contributed 22,000 gallons per day of industrial flow to the plant. These new Field's Point SIUs discharged wastewater generated from short term dewatering projects.

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 2019 and the reason for each reclassification are detailed in TABLE 1.

TABLE 1

2019 Significant Industrial Users Classification Changes
Firms Reclassified to Non-Significant

<u>Field's Point Firms</u>	<u>Reason for Reclassification</u>
Cardi Corporation	Firm ceased discharges.
Rhode Island Convention Center Authority - Garrahy Garage	Firm ceased discharges.
<u>Bucklin Point Firm</u>	<u>Reason for Reclassification</u>
Eaton Corporation	Firm ceased discharges from categorical operations.

Newly Classified Significant Users

<u>Field's Point Firms</u>	<u>Reason for Reclassification</u>
Cardi Corporation	Firm discharged greater than 5,000 gallons per day.
Rhode Island Convention Center Authority - Garrahy Garage	Firm discharged greater than 5,000 gallons per day.

During 2019, 22 Field's Point SIUs had changes in water usage that is noted in this section. Nine of the 22 firms increased their water usage by a combined total of 91,071 gallons per day. The remaining 13 of the 22 firms decreased their water usage by a combined total of 56,939 gallons per day. The net change to the Field's Point facility is an increase of 34,132 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 2019. Ten of the 20 SIUs increased their water usage by a combined total of 65,637 gallons per day. Ten of the 20 SIUs decreased their water usage by a combined total of 954,341 gallons per day. The net change in flow to Bucklin Point is a decrease of 888,704 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 2019 are detailed in TABLE 2.

TABLE 2

2019 Significant Industrial User Changes in Water Usage

Firms with Increased Flow

Field's Point

<i><u>Company</u></i>	<i><u>Change in Flow (gpd)</u></i>	<i><u>% Change</u></i>
A. Harrison & Company, Inc.	125	22.7%
G. Tanury Plating Company	5,446	13.9%
International Insignia Corporation	2,415	68.8%
Metallurgical Solutions, Inc.	76	33.5%
Providence Specialty Products	4,235	12.4%
Rhode Island Resource Recovery Corporation	75,907	25.3%
Technodic, Inc.	982	25.0%
Univar USA, Inc.	1,705	27.9%
Universal Plating Co., Inc.	180	23.2%

Bucklin Point

<i><u>Company</u></i>	<i><u>Change in Flow (gpd)</u></i>	<i><u>% Change</u></i>
The Okonite Company	2,175	60.6%
Teknor Apex Company	10,789	82.2%
Teknicote, Inc.	948	25.0%
Murdock Webbing Co., Inc.	2,081	14.7%
Materion Technical Materials, Inc.	4,799	94.0%
Isle Brewers Guild	15,701	170.1%
Interplex Engineered Products, Inc.	10,225	21.8%
HP Services, Inc.	551	88.6%
Chemart Company	4,311	24.8%
9W Halo OpCo LP	14,057	24.2%

TABLE 2
(continued)

2019 Significant Industrial User Changes in Water Usage

Firms with Decreased Flow

Field's Point

<i><u>Company</u></i>	<i><u>Change in Flow (gpd)</u></i>	<i><u>% Change</u></i>
A & F Plating Company	-242	-21.5%
Armbrust International, Ltd.	-2,472	-18.1%
DiFruscia Industries, Inc.	-6,464	-31.6%
E&M Enterprises, Ltd.	-884	-9.1%
Electrolizing, Inc.	-1,016	-11.5%
Induplate, LLC	-16,826	-34.3%
International Chromium Plating	-145	-15.6%
International Etching, Inc.	-2,211	-41.9%
Mahr, Inc.	-154	-11.3%
Manchester Street, Inc.	-13,441	-31.8%
Monarch Metal Finishing Co. - Aurora St.	-4,080	-100.0%
Monarch Metal Finishing, Inc.	-6,545	-26.7%
Providence Journal Company - Production Facility	-2,459	-11.3%

Bucklin Point

<i><u>Company</u></i>	<i><u>Change in Flow (gpd)</u></i>	<i><u>% Change</u></i>
Accent Plating Company	-497	-26.5%
Bliss Manufacturing Co., Inc.	-168	-19.4%
Cintas Corporation	-5,707	-7.5%
John Rocchio Corporation	-934,438	-92.8%
Maroon Group, LLC d/b/a Lincoln Fine Ingredients	-126	-45.2%
Organic Dyes and Pigments, LLC	-614	-38.7%
Pawtucket Power Associates	-4,028	-22.2%
Providence Metallizing Company, Inc.	-8,172	-36.7%
Stackbin Corporation	-159	-32.0%
Tiffany and Company	-432	-24.2%

In 2019, there were three SIUs that requested to increase the flow from their operations by 75,000 gallons per day. As required by the RIPDES permits that became final in December 2017, the Pretreatment Section notified the DEM of these substantial changes in flow. TABLE 3 below summarizes the Notifications of Substantial Change made in 2019.

TABLE 3
2019 Notifications of Substantial Change

<i>District</i>	<i>Company Name</i>	<i>Requested Flow Increase</i>
Bucklin Point	John Rocchio Corporation - Moshassuck Valley Interceptor Improvements	1.52 MGD
Field's Point	Rhode Island Resource Corporation	216,000 GPD
Field's Point	Cardi Corporation - NBC 78" Interceptor Replacement	576,000 GPD

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

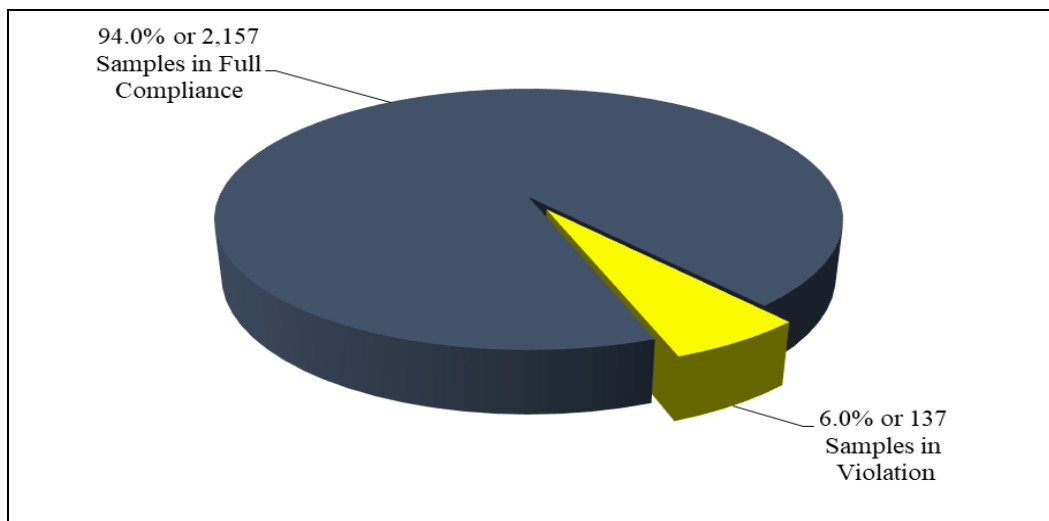
Through extensive user education efforts, quick enforcement response to user violations and regular monthly reminder telephone calls to users, the Pretreatment Section has over the years reduced its SIU rate of significant non-compliance substantially in both districts. The combined rate of SNC for significant industrial users located in the two NBC sewage districts for 2019 was 4.4%, a slight decrease from the SNC rate of 5.6% observed in 2018.

The SIU rate of SNC was dramatically reduced in Field’s Point from a high of 39.0% in 1992 to 2.9% for 2019, while the SIU rate of SNC for Bucklin Point was reduced from a high of 44.8% in 1994 to 5.9% in 2019. 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, 94.0% of the 2,294 analytical reports reviewed by the Pretreatment staff during 2019 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**



2,294 Total Analyses Reviewed

In addition, as shown in CHAPTER IV of this report, the 2019 rate of compliance of categorical users in the two districts was 97.7%, while the compliance rate for significant users was 94.9%. 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.

Nine firms located in the Field's Point and Bucklin Point districts were listed in a Public Notice in the Providence Journal on February 27, 2020 as being in SNC for the period from October 1, 2018 through December 31, 2019. Of the nine firms published for being in SNC, six users are located in Field's Point and three users are located in Bucklin Point.

The names of three non-categorical significant users were published for being in SNC, one is located in Field's Point and two are located in Bucklin Point. Six non-significant industrial users were listed in the Public Notice, five from Field's Point and one from Bucklin Point. Seven of the nine firms, or 77.8%, were listed as being in SNC solely for administrative violations such as submitting a report late. One firm listed in the notice was cited as being in SNC solely due to violations of effluent limitations. The final firm listed in the notice was cited as being in SNC due to effluent and administrative violations. At the time of publication of this report, all but one of the facilities cited as being in SNC were back in full compliance with NBC regulations. An administrative order was issued to the one facility that did not return to compliance in late 2019.

~ 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 2019, the NBC issued 1,629 Notice of Violation letters and two Administrative Orders. 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, EM, TAC, 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.

On September 29, 2017, the DEM issued new RIPDES permits to the Field's Point and Bucklin Point facilities. The permits became effective on December 1, 2017. The permits require the local limits for both facilities to be re-evaluated. The initial Local Limits Monitoring Plans (LLMP) were submitted to DEM on December 29, 2017. Revised LLMP incorporating comments from DEM and the Local Limits Workplan (LLWP) were submitted to DEM on February 28, 2018. The LLMPs were approved by DEM on April 10, 2018 and the LLWP was approved on November 15, 2018. The final Local Limits Re-Evaluation Reports (LLE) were submitted to DEM on May 15, 2019. In November, DEM requested additional information. The revised LLEs, including the additional information, were submitted on January 15, 2020 and February 21, 2020.

~ 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

In 2017, Pretreatment staff worked closely with RI Commerce Corporation on a LEAN permitting project. Part of the program incorporates e-permitting. E-permitting will allow business owners to sign permit applications electronically and submit the applications through a portal. NBC Wastewater Discharge Permit Applications required "wet" signatures. In order to fully participate in the e-permitting program, the NBC requested a non-substantial modification to the Pretreatment Program to allow electronic signatures on permit applications. The DEM approved the modification on July 7, 2017.

~ 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 4 and 6 and detail the 2019 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 5 and 7.

TABLE 4**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	Laurie A. Horridge, Executive Director
	Thomas P. Uva, ES&C Director
	Kerry M. Britt, Pretreatment Manager
Contact Telephone	(401) 461-8848
RIPDES Number	RI 0100315
Reporting Period	January 1, 2019 - December 31, 2019
Total Categorical Industrial Users as of the date of this report (throughout the reporting period)	23
Total Significant Non-Categorical IUs as of the date of this report (throughout the reporting period)	9 (11) (See Note 1)
Total # Significant Industrial Users (SIUs)	32 (34) (See Note 1)

2. Significant Industrial User (SIU) Compliance

	Significant Industrial Users	
	Categorical	Non-Categorical
1. # Of SIUs Submitting BMRs/# Required	3/3	3/3
2. # Of SIUs Submitting 90-Day Compliance Reports/# Required	0/0	2/2
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 <u>Not</u> had Adequate Enforcement Action by POTW	0	0
6. # Of SIUs in SNC with Reporting Requirements <u>At End</u> of Report Period	0	0
7. # Of SIUs in SNC With Effluent Requirements <u>At End</u> of Report Period	0	0

TABLE 4
(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	3/3	3/3
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	105	38
5. # Of Sampling Visits Conducted	50	20
6. # Of Facilities Inspected (Nonsampling)	23	11
7. # Of Facilities Sampled	23	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 4
(continued)

NARRAGANSETT BAY COMMISSION

FIELD'S POINT DISTRICT

PRETREATMENT PERFORMANCE SUMMARY SHEET

4. Enforcement Actions

	Significant Users			Total All Users
	Categorical	Non-Categorical	Non-Significant	
1. Compliance Schedules Issued	0	0	0	0
2. Notices Of Violation Issued	128	46	878	1,052
3. Admin. Orders Issued	0	1	1	2
4. Combined Total Of Administrative Orders and Notices of Violation	128	47	879	1,054
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)	0	1	5	6
8b. Rate of IUs in SNC	0/23 = 0.0%	1/11 = 9.1%	N/A	N/A
9a. Amount Of Penalties Collected (Total Dollars/IUs Assessed)	\$7,697/1	\$0/0	\$1,200/1	\$8,897/2
9b. Amount Of Penalties Assessed (Total Dollars/IUs Assessed)	\$0/0	\$20,000/1 (See Note 3)	\$8,500/1	\$28,500/2
10. # of IUs Subject to Any Enforcement Action	20	4	324	348
11. Other Actions (Mandatory Enforcement Meetings, Permit Suspensions, 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


DATE

TABLE 4
(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 2019 was in the process of making upgrades to its process equipment and pretreatment system. The upgrades were not completed by the end of 2019. This SIU did not discharge process wastewater in 2019.
- Note 3: An Administrative Order (AO) was issued to a non-categorical SIU in 2019. The AO required the SIU to submit a plan to come into compliance with its Wastewater Discharge Permit and implement the plan once it is approved. The AO further stipulates that failure to develop and implement the plan would result in the automatic imposition of a \$20,000 administrative penalty. Additional information on this AO can be found in CHAPTER VI.

TABLE 5

NARRAGANSETT BAY COMMISSION

FIELD'S POINT DISTRICT

REVISED PRETREATMENT REPORT SUMMARY SHEET

January 1, 2019 through December 31, 2019

POTW Name:	Narragansett Bay Commission (NBC)
NPDES Permit #:	RI0100315
Pretreatment Report Period Start Date:	January 1, 2019
Pretreatment Report Period End Date:	December 31, 2019
# of Significant Industrial Users (SIUs):	32 (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:	1
# of SIUs in SNC with Reporting Requirements:	1
# of SIUs in SNC with Pretreatment Compliance Schedule:	0
# of SIUs in SNC Published in Newspaper:	1
# of SIUs with Compliance Schedules:	0
# of Violation Notices Issued to SIUs:	174
# 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):	23
# of CIUs in SNC:	0
<u>Penalties</u> Total Dollar Amount of Penalties Collected:	\$8,897
# of IUs from which Penalties have been collected:	2

TABLE 5

(continued)

NARRAGANSETT BAY COMMISSION

FIELD'S POINT DISTRICT

REVISED PRETREATMENT REPORT SUMMARY SHEET

January 1, 2019 through December 31, 2019

<u>Local Limits</u> Date of Most Recent Technical Evaluation of Local Limits:	September 30, 2004 (See Note 3)
Date of Most Recent Adoption of Technically Based Local Limits:	1987

Pollutant	Limit (mg/l)	MAHL (lb/day) (See Note 4)
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 2019 was in the process of making upgrades to its process equipment and pretreatment system. The upgrades were not completed by the end of 2019. This SIU did not discharge process wastewater in 2019.

Note 3: A Local Limits Evaluation (LLE) Report was submitted to DEM on May 15, 2019. Revised LLEs incorporating comments from DEM were submitted on January 17, 2020 and February 21, 2020.

Note 4: 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 6
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	Laurie A. Horridge, Executive Director
	Thomas P. Uva, ES&C Director
	Kerry M. Britt, Pretreatment Manager
Contact Telephone	(401) 461-8848
RIPDES Number	RI 0100072
Reporting Period	January 1, 2019 - December 31, 2019
Total Categorical Industrial Users as of the date of this report (throughout the reporting period)	18 (19) (See Note 1)
Total Significant Non-Categorical IUs as of the date of this report (throughout the reporting period)	15
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	2/2	3/3
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 <u>Not</u> had Adequate Enforcement Action by POTW	0	0
6. # Of SIUs in SNC with Reporting Requirements <u>At</u> <u>End</u> of Report Period	0	0
7. # Of SIUs in SNC With Effluent Requirements <u>At</u> <u>End</u> of Report Period	0	0

TABLE 6

(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	2/2	4/4
2. # Of SIUs Without Active (Expired) Permits	0	3/3
3. # Of SIUs With Permits Expired For 180 Days Or More	0	0
4. # Of Non-Sampling Inspections Conducted	68	59
5. # Of Sampling Visits Conducted	37	33
6. # Of Facilities Inspected (Nonsampling)	19	15
7. # Of Facilities Sampled	18 (See Note 2)	15
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
10. # Of SIUs in SNC with Self Monitoring and Not Inspected and Not Sampled in the Past 12 Months	0	0

TABLE 6
(continued)

NARRAGANSETT BAY COMMISSION
BUCKLIN POINT DISTRICT
PRETREATMENT PERFORMANCE SUMMARY SHEET

4. Enforcement Actions

	Significant Users			Total All Users
	Categorical	Non-Categorical	Non-Significant	
1. Compliance Schedules Issued	0	0	0	0
2. Notices Of Violation Issued	50	79	448	577
3. Admin. Orders Issued	0	0	0	0
4. Combined Total Of Administrative Orders and Notices of Violation	50	79	448	577
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)	0	2	1	3
8b. Rate of IUs in SNC	0/19 = 0%	2/15 = 13.3%	N/A	N/A
9a. Amount Of Penalties Collected (Total Dollars/IUs Assessed)	\$0/0	\$0/0	\$0/0	\$0/0
9b. Amount of Penalties Assessed (Total Dollars/IUs Assessed)	\$0/0	\$0/0	\$0/0	\$0/0
10. # of IUs Subject to Any Enforcement Action	11	13	165	189
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


DATE

TABLE 6

(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 2019 discharges on a batch basis and decided to ship all process wastewater off-site for disposal in 2019. This was verified during inspections.

TABLE 7

**NARRAGANSETT BAY COMMISSION
BUCKLIN POINT DISTRICT
REVISED PRETREATMENT REPORT SUMMARY SHEET**

January 1, 2019 through December 31, 2019

POTW Name:	Narragansett Bay Commission (NBC)
NPDES Permit #:	RI0100072
Pretreatment Report Period Start Date:	January 1, 2019
Pretreatment Report Period End Date:	December 31, 2019
# 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:	1
# 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:	129
# 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):	19
# of CIUs in SNC:	0
Penalties Total Dollar Amount of Penalties Collected:	\$0
# of IUs from which Penalties have been collected:	0

TABLE 7
(continued)
NARRAGANSETT BAY COMMISSION
BUCKLIN POINT DISTRICT
REVISED PRETREATMENT REPORT SUMMARY SHEET

January 1, 2019 through December 31, 2019

Local Limits		
Date of Most Recent Technical Evaluation of Local Limits:		September 30, 2007 (See Note 3)
Date of Most Recent Adoption of Technically Based Local Limits:		1991
Pollutant	Limit (mg/l)	MAHL (lb/day) (See Note 4)
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 2019 discharges on a batch basis and decided to ship all process wastewater off-site for disposal in 2019. This was verified during inspections.

Note 3: A Local Limits Evaluation (LLE) Report was submitted to DEM on May 15, 2019. Revised LLEs incorporating comments from DEM were submitted on January 17, 2020 and February 21, 2020.

Note 4: 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 September 29, 2017, the Rhode Island Department of Environmental Management (DEM) issued new or revised RIPDES permits to both Field's Point and Bucklin Point facilities. The final permits became effective on December 1, 2017. The RIPDES permit number for Field's Point is RI0100315 and the RIPDES permit number for Bucklin Point is RI0100072. These permits specified the stringent seasonal total nitrogen limits of 5.0 ppm of both facilities. In addition to specifying the nitrogen permits limits the new permits also imposed many new requirements including requirements dealing with climate change resiliency and public notification. The NBC requested and received a stay of several new requirements. Throughout 2018, the NBC worked with DEM to resolve these issues. In January 2019, the NBC and DEM entered into a Consent Agreement (CA), RIA-424. The CA addressed the new stringent limits and other requirements that had been stayed in 2018. On March 20, 2019 DEM issued final permit modifications for both facilities. Further discussion on the permits can be found in CHAPTER V.

Personnel

The control and reduction of toxic and nuisance discharges to the sewer system falls under the Division of Environmental Science and Compliance (ES&C), Division. The ES&C Division 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 for the NBC is provided in FIGURE 2, while the organizational plan for the ES&C division is provided in FIGURE 3.

The ES&C Division consists of the Pretreatment, Environmental Monitoring (EM), Laboratory and Technical Analysis & Compliance (TAC) sections. ES&C 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 Pollution Prevention staff within the TAC Section achieve pollutant reductions through user education efforts and by providing free technical assistance. Both sections rely upon the services and expertise of the EM and Laboratory Sections. The EM Section conducts user, river, treatment facility, and manhole monitoring activities and is responsible for logging and preparing data reported on samples analyzed by the Laboratory Section. The TAC section analyzes all types of data and submits regulatory reports necessary to ensure agency compliance.

During 2019 there were two personnel changes in the Pretreatment Section. The first change occurred in February when Anthony Erricola vacated his Pretreatment Engineer position for a position in private industry. This vacant Pretreatment Engineer position was filled by Alex Bisson in September. The second change occurred when Heather Nicholson vacated her Pretreatment Technician position. This vacant Pretreatment Technician position was filled by Anthony Crocenzi in September.

In late 2018 the needs of the NBC were re-evaluated and it was determined the timing was ideal to combine the functions of the Water Quality Compliance and Environmental Safety & Technical Assistance sections into one section, Technical Analysis & Compliance (TAC). In January James Kelly was promoted to fill the newly created TAC Manager position vacating his Assistant Environmental Monitoring Manager Position. Based on the previously noted responsibilities it was determined the Environmental Scientists would be moved from the Environmental Monitoring section to TAC. At this time a Senior Environmental Scientist position was created. Eliza Moore was promoted to this position in April. Christine Comeau vacated her Environmental Scientist position in June. This vacant Environmental Scientist position was filled by Luis Cruz in September. The duties of one of the Environmental Compliance Technical Assistant positions were reevaluated and it was upgraded to Sustainability Coordinator. This position was filled by Kerri Houghton. The previously vacant Environmental Compliance Technical Assistant position was filled by Bethany Lewis in January 2020.

There were three personnel changes in EM in 2019. The first change occurred in January when James Kelly was promoted to TAC Manager vacating his Assistant Environmental Manager position. Karen Cortes was promoted to the vacant Assistant Environmental Monitoring Manager position in April vacating her Environmental Data Analyst position. The duties of the Environmental Data Analyst position were reevaluated, and it was determined there is a strong focus on the LIMS system. It was retitled to LIMS Data Coordinator. This position was filled by Sean Grace who vacated his Sample Compliance Coordinator position in August. The third change occurred in May when Dan Barlow vacated his Environmental Monitor position for a position in the Interceptor Maintenance section. Daryll Sirleaf filled this vacant Environmental Monitor position in June.

There was one personnel change in the Laboratory in 2019. This change occurred when Sean Grace was promoted to fill the LIMS Data Coordinator position in the EM Section vacating his Sample Compliance Coordinator position. Jake Westfield filled this vacant position in November.

FIGURE 2
Narragansett Bay Commission

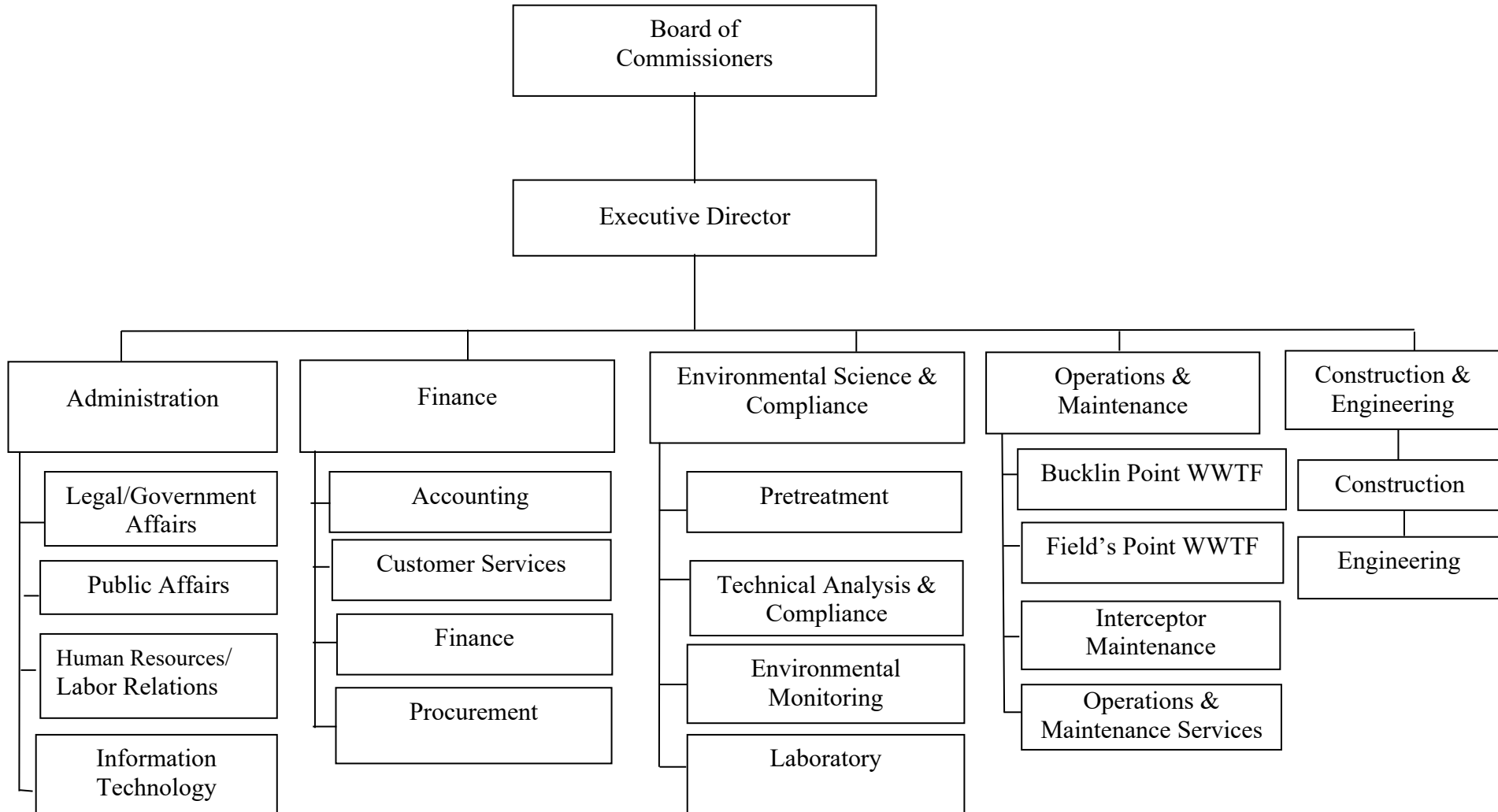
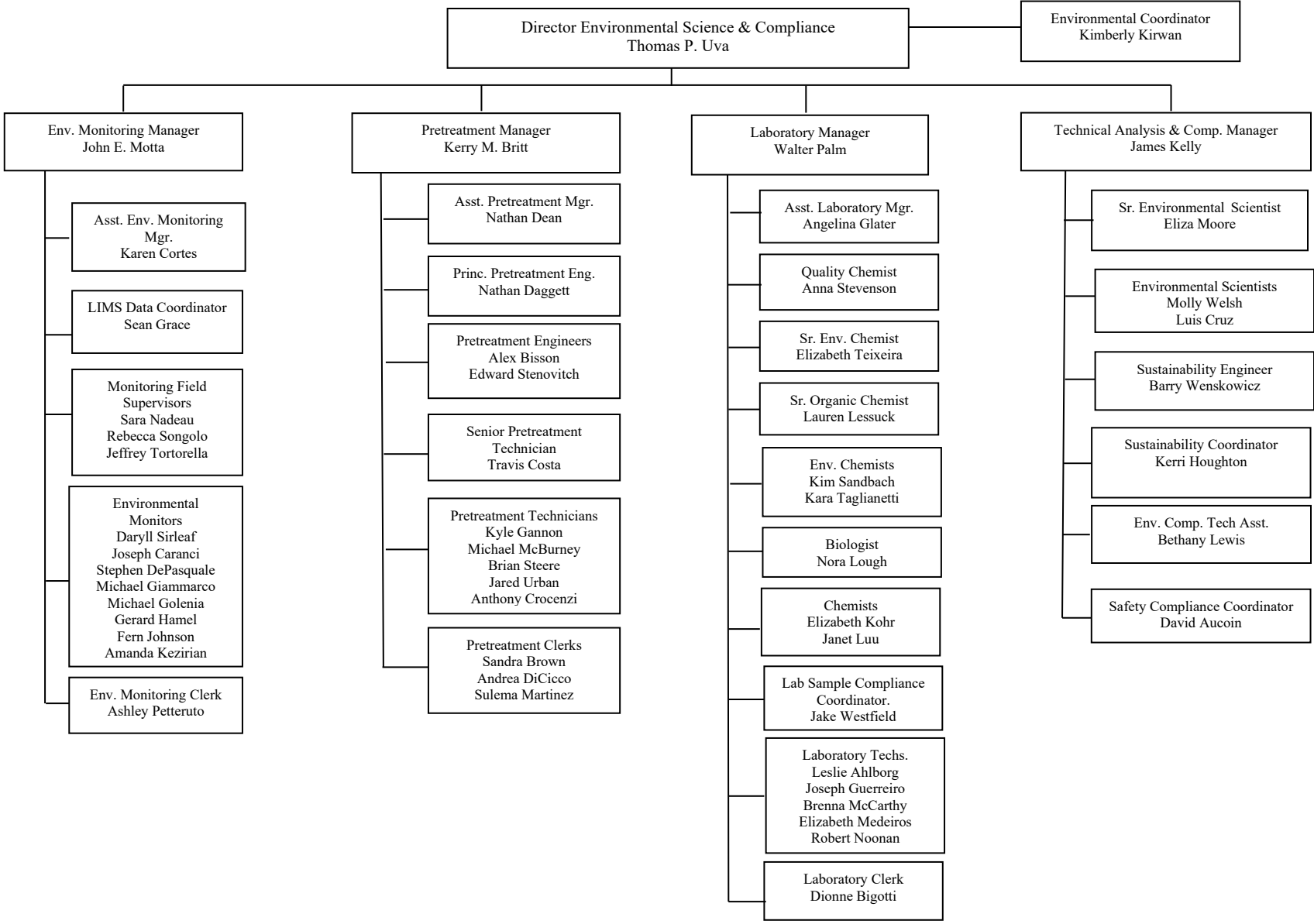


FIGURE 3
Narragansett Bay Commission
Division of Environmental Science & Compliance
March 15, 2020



Staff Training

The NBC provides extensive training to its employees and has a tuition reimbursement program to assist employees in furthering their education. During 2019, 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 2019:

- CPR/AED
- Environmental Health & Safety Awareness
- HazCom/Right-to-Know Training
- Healthy Back, Slips, Trips and Falls
- Occupational Hearing Safety
- Permit Required Confined Space
- First Aid Training
- Man Overboard Training
- Emergency Preparedness Plans
- Gas Meter Training
- Port Evacuation
- Active Shooter & Workplace Violence
- Workzone Safety 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, EM, TAC and Laboratory personnel during 2018:

- 40-Hour HAZWOPER Training
- 8-Hour HAZWOPER Refresher Training
- Spill Tracking
- Spill Prevention Control & Countermeasures Plan/Storm Water Management Plan Training
- Calculating Water use for Zero Discharge Companies
- Reviewing Self Monitoring Compliance Reports for Completeness
- Proper Sample Port Training
- Emergency/Special Investigation Write-Ups
- Use of NBC Inspection Powers
- Use of Google Maps for Inspections and Investigations
- Advanced Local Limits Development
- Pretreatment 101
- YSI Training
- RI DEM QAPP Training



ES&C 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 2019 are as follows:

- 2019 New England Regional Pretreatment Coordinators Conference
- NACWA The PFAS Tsunami
- WEF Collection Webinar on Fats, Oils and Grease
- Multi Sector General Storm Water Workshop
- Utility of the Future Webinar
- NEWEA Energy Committee Conference
- What We Monitor for and Why
- Field Observations in Environmental Data Collection
- Rhode Island Executive Climate Change Coordinating Council
- How Oysters Alter Coastal Waters
- Water Research Foundation (WRF) Webinar-Guidance Manual for Monitoring Biological Filtration of Drinking Water
- Evaluation of Data Needs to Support Water Quality Models for Setting Nutrient Targets
- EPA Southeast New England Program Monitoring Subcommittee Workshop Control Strategies
- Coastal Marine and Estuarine Classification Standards Webinar
- Northeast Regional Ocean Council Habitat Classification and Ocean Mapping
- WRF Webinar- Pepper Mild Mottle Virus: A Plant Pathogen with a Greater Purpose in Microbial Water Quality Analyses
- The Importance of Strategic Planning in Laboratory Informatics Project
- Ocean Acidification: High-Frequency Long Term Measurements of pH and Deployment Best Practices
- PFAS Basics: An Introduction to the Chemistry, Sources,, Regulation and Analysis
- Workshop on Synthesizing the Nitrogen Removal Capacity of Oyster habitats via Denitrification
- TMDL Development efforts for Narragansett Bay
- Understanding the science and Toxicity of PFAS-A Deeper Dive
- Department of energy Wastewater Energy Optimization In-Plant Training
- Narragansett Bay Fixed-Site Network
- EPA Biosolids eReporting Webinar
- Environmental Energy and Climate Change and Legislative Briefing
- Instructional Design Training for New Designers
- Southeast NE Environmental Monitoring Workshop
- RI Established Program to Stimulate Competitive Research/RI Consortium for Coastal Ecology Assessment, Innovation and Modeling Annual Research Symposium
- How Rhode Island Sound May Be Fueling Harmful Algal Blooms in Narragansett Bay
- The State of Storm Water in Rhode Island
- ISO 50001 Ready Training
- NEWEA-Nitrogen and Phosphorus Removal Small Community Specialty Conference
- Electric Vehicle Ride and Drive

The NBC provides 40-Hour HAZWOPER training to all new Pretreatment, EM, TAC and Laboratory 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, EM, TAC 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 2019 are as follows:

- Excel
- New Computer Training
- Sexual Harassment: Prevention & Response
- SharePoint
- Service Desk
- Web and Internet Email
- R-Statistics Workshop
- NBC Mobile GIS App
- Developing Emotional Intelligence
- Creating Invoices using Oracle
- Issuing Permit Application Fee Invoices
- How Managers Become Great Leaders
- Leadership Team-Building and Coaching Skills
- Making the Transition from Staff to Supervisors
- Site Core Software
- Introduction to GIS
- Crash Course for the First Time Supervisor

The NBC provides a tuition reimbursement program to encourage employees to further their education. The college courses that staff attended during 2019 are as follows:

- Doctoral Thesis Research

In addition to attending trainings, workshops and seminars, ES&C 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 ES&C staff in 2019:

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

Throughout 2019, ES&C 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 ES&C Division as necessary to ensure environmental protection. The ES&C Division budget for fiscal year 2020 (FY20) was \$5,974,096. The FY20 ES&C Division budget allocated \$4,967,344 or 83.1% to personnel costs.

The approved FY20 Pretreatment budget was \$1,157,954, a 5.4% decrease from the FY20 budget of \$1,223,634. The FY20 Pretreatment budget allocated 97.1%, or \$1,123,754, to personnel costs.

The budget for the EM Section in FY20 was \$1,677,527 of which 81.3% or \$1,364,007 was attributed to personnel expenses. The FY20 EM budget decrease by 8.0% from the previous year.

The approved TAC budget for FY20 was \$803,499. The approved FY19 Laboratory budget was \$2,335,116, a decrease of 10.3% or \$267,485 from the previous year. Personnel costs associated with the TAC, and Laboratory budgets were 93.1%, and 74.1% 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. Throughout the first half of 2019 Pretreatment staff worked with the NBC Finance Section to evaluate the optimal way to recuperate the costs of the Pretreatment Program while not placing an excessive financial burden on business. It was determined that the annual permit fee structure was no longer needed. The consumption rates for industrial and commercial users were slightly increased and permit application fees were implemented to ensure the Pretreatment Program is adequately funded. This new rates and fees were approved by the PUC and went in to effect on July 1, 2019. This permit fee rate structure is provided in CHAPTER III.

Pretreatment Information Management Computer System

The Pretreatment software system was completely developed in-house by the NBC Information Technology (IT) Section. 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.

Throughout 2019 Pretreatment and IT staff continued to optimize the Pretreatment System which had been upgraded in 2016. The upgrade improved the functionality and efficiency. The upgraded system can be accessed on the iPads. In addition staff can access mapping apps directly from the software. During 2020 Pretreatment staff will continue to work with IT to 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 2018 the software system was programmed to give Pretreatment staff the ability to enter schedules to track the submittal of required certifications including Certification of No Discharge, Certification of Compliance with Dental Amalgam Best Management Practices, Meter Calibration Certification and Cooling Tower Chemical Certification. Prior to this programing being put online, staff had to track these submittals by using other methods and custom tailor computer generated Notices of Violation if necessary.

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 2019. 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. In 2018 computer applications were uploaded to the inspection iPads which allowed staff to access the Pretreatment computer tracking system went out in the field.

In 2018 the NBC requested and received a minor modification to the Pretreatment Program to allow electronic signatures on permit applications. Throughout 2019, Pretreatment and IT staff worked on the development of a webpage where facilities will be able to complete and submit permit applications online. This webpage should go live in mid 2020.

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 Pollution Prevention and Pretreatment staff 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;

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 2019, the NBC sent twelve informational letters to various categories of regulated users located in the two districts. TABLE 8 describes each of these informational letters.

TABLE 8
2019 Informational Letters

<u>Issue Date</u>	<u>Description</u>
January 3, 2019	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
March 6, 2019	This letter was issued to all SIUs congratulating the 19 companies that achieved perfect compliance for the 2018 review period.
March 7, 2018	This letter was sent to all permitted users announcing 24 th annual Environment Merit Awards and invited them to nominate themselves for an award.
March 8, 2019	This letter was issued to all SIUs notifying them they were classified as SIUs during 2018. This letter reminded these companies of the reporting requirements outlined in 40CFR§403.12.
March 15, 2018	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 3, 2019	This was issued to all users who were published in the Providence Journal on February 22, 2019 for being in Significant Non-Compliance (SNC) for the reporting period of October 1, 2017 through December 31, 2018. An invoice for their portion of the cost to publish the notice was included with the letter.
June 5, 2017	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.
August 6, 2019	This letter was issued to all permitted users notifying them that annual permit fees were eliminated and permit application fees were now being implemented.
September 24, 2019	This letter was issued to all permitted breweries and distilleries informing them that the DEM developed fact sheets for their industry. The fact sheets provide useful information on the impact the wastewater from their operations on the treatment plants. Links to the fact sheets were provided.

TABLE 8

2019 Informational Letters (cont'd)

October 7, 2019	This letter was issued to all facilities utilizing #4, #5 or #6 fuel oil. The letter recommended the companies inspect their heating systems prior to seasonal start-up the system to prevent accidental releases of fuel oil to the sewer.
November 1, 2019	This letter was issued to unpermitted dental facilities in the NBC districts to notify them they are required to comply with the EPA Dental Point Source Category-Dental Rule (40CFR441). The facilities were required to complete and submit the NBC One-Time Compliance Report Form for Dental Facilities. In addition, these facilities were informed they would need to apply for a Wastewater Discharge Permit if they place or remove dental amalgam.
November 21, 2019	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.

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 Pretreatment and TAC Sections;
- 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 2019 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 2019, 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 October 21, 2019 with a web-based video on the importance of clean water infrastructure in our daily lives.

- *Advocacy for Clean Water* - In 2019, the NBC worked with over 1,600 wastewater treatment facilities nationwide to advocate for federal funding for clean water infrastructure. The NBC Executive Director served as 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 2019, 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 fifteen schools and 800 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.
- *Teaching Teachers* - In 2019, the NBC hosted NEWEA's teacher training, bringing over twenty New England area teachers to the Field's Point plant to learn about clean water. Activities included a tour of the plant, hands-on time in the Laboratory with NBC biologists and chemists, and one-on-one time with the NBC Environmental Education Specialist
- *Celebrating the Importance of Narragansett Bay* - For the twenty-fifth 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 2020 calendar. In addition, the winning posters were exhibited at the Fields Point WWTF Education Center.
- *Recognizing Students for Environmental Awareness* - For the twenty-seventh 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.

- *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* – In 2019, the NBC recognized 19 companies in the service district with Environmental Merit Awards for Perfect Compliance Awards with regulatory requirements and one for its Pollution Prevention efforts. 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 2019, approximately 76% the energy used by the NBC was generated by the three 1.5 megawatt wind turbines, located at Field's Point, three NBC owned wind turbines, located in Coventry, RI and solar arrays in Richmond, RI. The wind turbines serve a visual reminder to all Rhode Islanders of the NBC leadership in sustainable energy and clean water.
- *Bi-lingual Information* – During 2019, 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 Gloria Gemma Breast Cancer Research Foundation and The Red Cross.
- *State Employee Charitable Appeal* - NBC employees participated in the 2019 State Employees Charitable Appeal (SECA) and raised over \$15,000 for a host of worthwhile, appreciative charitable organizations.
- *Mentoring the Next Generation of Big Thinkers* - In 2019 the NBC sponsored the RI Hack for Global Good, an event for high school students focusing on how to solve the problem of pollution on the planet. In addition to providing financial support through the Environmental Enforcement Fund. NBC staff served as mentors and judges for the students. NBC staff also provide technical assistance to the St. Mary Academy-Bay View Middle School robotics team who developed a system to treat road runoff.

- *Residential Grease Control Program* – In 2019, the NBC expanded upon its award-winning campaign to educate school children on the impacts of cooking grease on the sewer system and how to dispose of it. Mr. Can vs. The Grease Beasts became a part of the NBC Watershed Explorer Program and served as the subject for the annual poster contest. The YouTube video continued to amass hits and free promotional materials such as pins, coloring books and posters are available in both English and Spanish.



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 2019, 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

~Water Environment Federation (WEF)

On May 30, 2019 Kerry Britt, Pretreatment Manager, gave a presentation entitled “NBC Grease Control Program from Development to Present” during a WEF Collectors webcast

~New England Regional Pretreatment Coordinators Association (NERPCA) Conference

The 2019 NERPCA Conference was held in Lowell, MA on October 22 and 23, 2019. During the conference Kerry Britt, Pretreatment Manager conducted the annual NERPCA business meeting. Barry Wenskowicz, Environmental Sustainability Engineer, gave a presentation the NBC Sustainability Programs during the conference.



Water Quality Presentations

~Northeast Regional Ocean Council (NROC)



On May 13, 2019 Eliza Moore, Senior Environmental Scientist, gave a presentation on Benthic Video Methods in the Providence River, Narragansett Bay, RI at the NROP Habitat and Ocean Mapping meeting.

Energy Presentations

~Brown University

On April 12, 2019 Barry Wenskowicz, Sustainability Engineer gave a presentation on the NBC Sustainable Energy Program for the Brown University Students.

~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. Fifteen schools and over 800 students participated in the program in 2019.

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 8,798 different industrial and commercial users located within the two NBC sewer districts. During 2019 the Pretreatment staff identified and entered information on 141 previously unknown users into the NBC Pretreatment database. Pretreatment users are categorized according to the classification system shown in TABLE 9. 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 9
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 9
(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 9
(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 8,748 industrial and commercial users have been identified through user surveys, 5,831 are still conducting business in the NBC service areas and 68 were classified as SIUs sometime during 2019. Of the 68 SIUs reported for 2019, there were 42 classified as categorical industries which are subject to both NBC and EPA regulations, and 26 significant non-categorical industrial users of the NBC sewer system. During this reporting period, 3 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 2019. These two facilities also ceased discharging in 2019. 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 1,847 Wastewater Discharge Permits in effect, which were issued to facilities located in the Field's Point and Bucklin Point drainage districts. Presently, 1,260 permits are in effect for users in the Field's Point district, while 587 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 9. During this reporting period, Pretreatment staff issued 439 permits to users located in the two districts. Of the 439 permits issued during 2019, there were 141 new permits issued to new commercial and industrial users and 298 permits were reissued to existing users because the old permit expired or the firm changed process operations. A listing of the permits issued in 2019 is provided in ATTACHMENT VOLUME II, SECTION 2.

TABLE 10
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	22	14	36
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	4	7
22	Chemical Transporters, Refiners, Recyclers, Manufacturers	2	3	5
23	Textile Firms	1	7	8
24	Printers	7	6	13
25	Industrial Laundries	1	3	4
26	Machine Shops/Machinery Rebuilding	2	2	4
27	Other Firms Discharging Toxics	8	11	19
28	Central Treatment Facilities, Hazardous	0	0	0
29	Central Treatment Facility, Non-Hazardous	0	0	0
34	Manufacturers With High BOD/TSS	5	6	11
35	Firms Discharging Conventional Pollutants	4	3	7
37	Automotive Maintenance/Service Facilities	16	4	20
40	Groundwater Remediation/Excavation Projects	4	2	6
41	Regulated Electroplating Or Chemical Processes Disconnected Or Recycled	8	3	11
42	Other Regulated Processes That Are Disconnected Or Recycled	18	23	41
43	Recycle Electroplating Or Chemical Processes With Cooling Water Or Boiler Discharges	8	0	8
44	Other Recycle Processes With Non-contact Cooling Water Or Boiler Discharges	2	6	8
46	Cooling Water With Solvents/Toxics On Site	5	2	7
49	Firms With Solvents, Toxics, Etc. On Site	1	1	2
51	Cooling Water	3	1	4
52	Boiler Blowdown/Condensate Discharges	10	3	13
53	Cooling Tower Discharges	8	5	13
59	Other Nontoxic Discharges	2	4	6
80	Septage Haulers/Dischargers	1	14	15
81	Food/Meat/Fish Produce Processing (Wholesale)	50	28	78
82	Supermarkets (Retail Food Processing)	23	10	33
83	Parking Garages/Lots	1	0	1

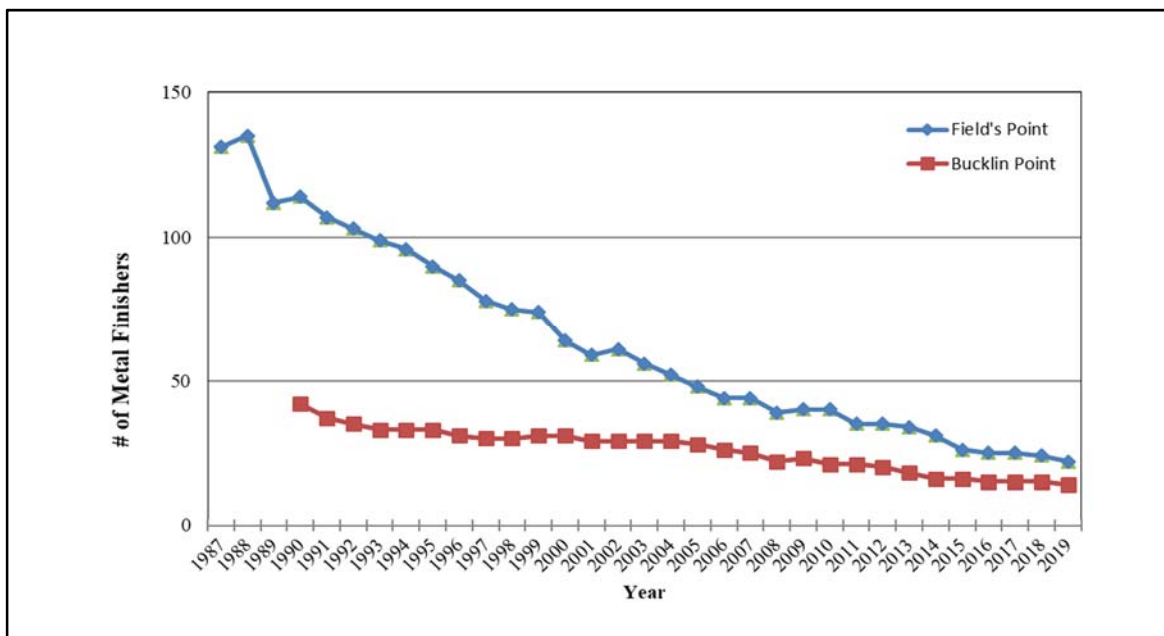
TABLE 10
(Continued)
Narragansett Bay Commission
Summary of Wastewater Discharge Permits in Effect

Category	Company	Field's Point District	Bucklin Point District	Total Permits In Effect
84	Cooling Water/Groundwater/Boiler Discharges	9	0	9
85	Restaurants/Food Preparation Facilities	642	250	892
86	Comm. Buildings With Cafeteria/Laundry	168	48	211
89	Other Commercial Users With Potential to Discharge - Conventional Pollutants	16	7	23
90	Hospitals	10	0	10
91	Cooling Water/Ground Water/Boiler Discharges	0	0	0
92	Laundromats/Dry Cleaners	49	30	79
93	Photo Processing	4	1	5
94	X-Ray Processing	51	35	86
95	Clinical, Medical, And Analytical Laboratories	21	3	24
96	Funeral Homes/Embalming	13	9	22
97	Motor Vehicle Service/Washing	40	20	60
99	Other Commercial Users With Potential To Discharge Toxic Or Conventional Pollutants	27	15	42
	Total Permits in Effect	1,260	587	1,847

There were 9 permits revised and reissued to SIUs in the two districts during 2019, while three new permit were issued to this class of users. Five of the 9 revised permits were issued to categorical users during 2019, while the four remaining revised permits were issued to significant non-categorical users.

As can be seen from TABLE 10, 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 and dental 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 metal finishers in the Field's Point district since 1984 and in Bucklin Point since 1990 is clearly detailed in FIGURE 4. During 2019 the number of metal finishers in both districts decreased by three from 2018.

**FIGURE 4
Number of Metal Finishers vs. Time**



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 were standardized in both NBC districts and many categories were also flow dependent to encourage water conservation. Beginning in late 2018 Pretreatment staff worked with the NBC Finance Section to evaluate the optimal way to recuperate the

costs of the Pretreatment Program while not placing an excessive financial burden on business. It was determined the annual permit fee structure was burdensome. A study determined that slightly increasing the consumption fees for industrial and commercial users and implementing permit application fees will ensure the Pretreatment Program is adequately funded. The rates and application fees were approved by the PUC and went into effect on July 1, 2019. The NBC wastewater discharge permit fee rate structure that was in effect from January 1, 2019 through June 30, 2019 is provided in TABLE 11 and the application fees are provided in TABLE 12.

TABLE 11
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 11
(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 \geq 10,000 GPD 2,500 \leq Flow < 10,000 GPD Flow < 2,500 GPD	 \$2,898.00 \$1,449.00 \$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 \geq 100,000 GPD 50,000 GPD \leq Flow < 100,000 GPD 10,000 GPD \leq Flow < 50,000 GPD Flow < 10,000 GPD	 \$5,797.00 \$3,623.00 \$1,811.00 \$1,087.00
35	Other facilities discharging conventional pollutants Flow \geq 10,000 GPD Flow < 10,000 GPD	 \$1,449.00 \$725.00
37	Automotive Maintenance/Service Facilities Small \leq 2 Bays Large \geq 3 Bays	 \$435.00 \$1,449.00
40	Groundwater Remediation/Excavation Projects Flow \geq 10,000 GPD Flow < 10,000 GPD	 \$1,449.00 \$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 \geq 10,000 GPD Flow < 10,000 GPD	 \$1,087.00 \$725.00

TABLE 11

(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 \geq 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 \leq Flow $<$ 10,000 GPD	\$725.00
	Flow \geq 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
	\geq 50 seats $<$ 100 seats	\$435.00
	\geq 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 \geq 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 \geq 2 washers	\$725.00
93	Photo Processing	
	Flow $<$ 1,000 GPD	\$362.00
	1,000 GPD \leq Flow $<$ 2,500 GPD	\$725.00
	2,500 GPD \leq Flow $<$ 5,000 GPD	\$1,087.00
	Flow \geq 5,000 GPD	\$1,449.00

TABLE 11
(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

TABLE 12
Narragansett Bay Commission
Pretreatment Permit Application Fees

Category	Fees
Significant Industrial Users	\$500.00
Industrial Users	\$300.00
Commercial Users	\$140.00

Zero Process Discharge Wastewater Systems

During 2019, there were 70 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-two 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 16 of these users which are classified in categories 43 and 44. Of

the 68 users classified in categories 41 through 44, 36 facilities are permitted to operate zero process discharge wastewater recycle systems in the Field's Point district, while 32 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 and Yelp 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 also met with various user groups and held workshops that focused on educating any new class of users required to obtain a discharge permit.

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. TAC 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 2019 Pretreatment staff continued to utilize 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, EM, TAC and Laboratory 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 Refresher 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.

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.



Pretreatment staff participate in the annual Spill Response and Tracking Drill

- ~ *Pollution Prevention Referral Program* – During all Pretreatment regulatory inspections, Pretreatment staff routinely refer the user to the Pollution Prevention Program for free technical assistance. All NOV's also advise users to obtain the free expertise of the Pollution Prevent staff in the TAC 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 2.9% in 2019, while the SIU Rate of SNC for Bucklin Point was reduced from a high of 44.8% in 1994 to 5.9% in 2019. The overall rate of SNC for all NBC SIUs for 2019 was 4.7%, a decrease from 5.6% observed in 2018. 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, 2019 through December 31, 2019, Pretreatment staff conducted 1,834 inspections of users, not including sampling visits. Of the 1,834 non-sampling inspections conducted by the Pretreatment staff, 264 were inspections of SIUs and 1,570 were inspections of non-significant users. Pretreatment staff conducted 173 facility inspections of categorical users and 91 inspections of significant non-categorical industrial users in both districts, excluding sampling visits. Pretreatment staff conducted 37 regulatory compliance meetings with users during 2019.

Pretreatment staff inspected all companies classified as SIUs at least twice during the 12 month review period. The Pretreatment Section satisfied and exceeded EPA requirements to inspect every SIU at least once every twelve month period.

During 2019, EM staff conducted 153 industrial user sampling inspections of 72 industrial user facilities resulting in the collection of 1,626 composite and grab samples. These 1,626 samples translated to 161 user monitoring reports. Of the 161 monitoring reports, 148 were issued to significant user and 13 were issued to non-significant users. There were 92 sampling inspections of 41 categorical industries and 56 sampling inspections of 25 significant non-categorical users.

All facilities classified as SIUs were sampled by EM at least twice in 2019 with the exception of three. One of the SIUs that was unable to be sampled, Tanury Industries PVD, Inc. discharges on a batch basis. During 2019, the company collected all process wastewater and shipped it off-site for disposal. This was verified by Pretreatment staff during inspections. EM staff regularly contacted the company to inquire if a batch was to be discharged to the sewer. The second SIU that was unable to be sampled in 2019, was Orbit Energy Rhode Island, LLC. This company anticipated beginning operations in 2020. However, the company decided to upgrade its process equipment and pretreatment system prior to beginning to discharge. The upgrades had not been completed by the end of 2019. Therefore, discharges to the sewer system did not occur. The third SIU not sampled twice in 2019, Monarch Metal Finishing Co. – Aurora Street, EM collected a sample in mid March. However, there was a small fire at the facility at the end of March. The firm did not re-open throughout the remainder of 2019. Therefore, an additional was unable to be sample was not collected.

TABLE 13 summarizes the status of each company that was inspected or sampled by the NBC less than twice in 2019.

TABLE 13
Summary of SIUs Inspected or Sampled Less than Twice in 2019

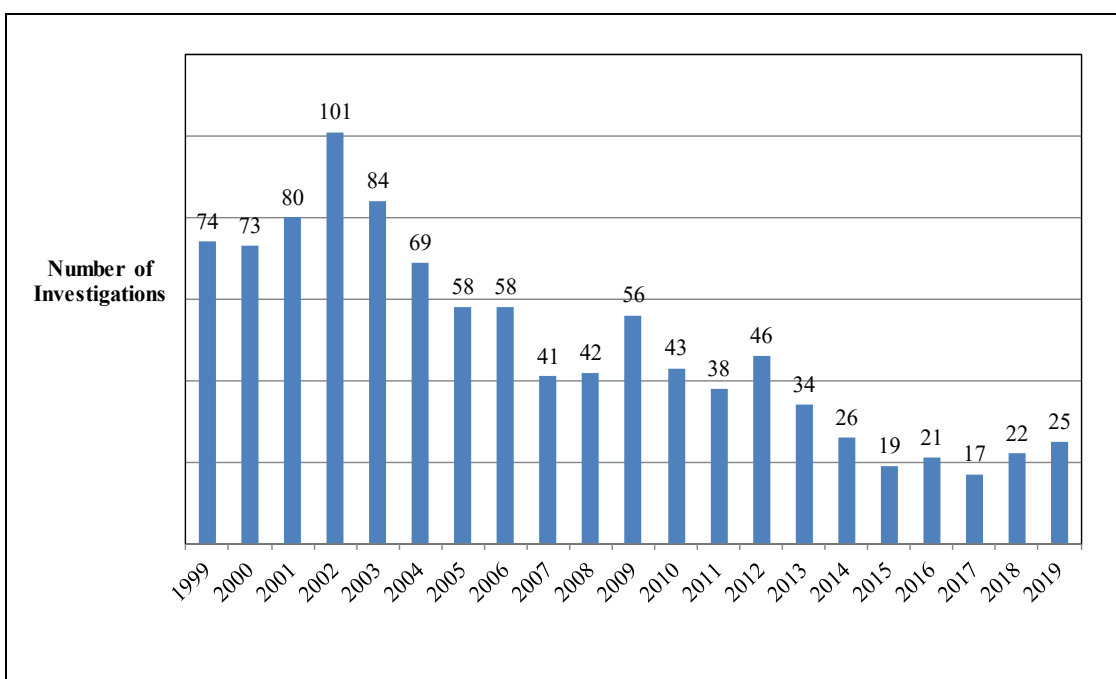
Company Name	2019 Inspection & Sample Summary	Explanation
Field's Point		
Orbit Energy Rhode Island, LLC	No Samples	Facility under construction – no process wastewater discharged
Monarch Metal Finishing Co., - Aurora Street	1 Sample	Firm experienced a fire and did not re-open in 2019
Bucklin Point		
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 4 and 6, 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 2019, Pretreatment staff investigated 25 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 2019 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**

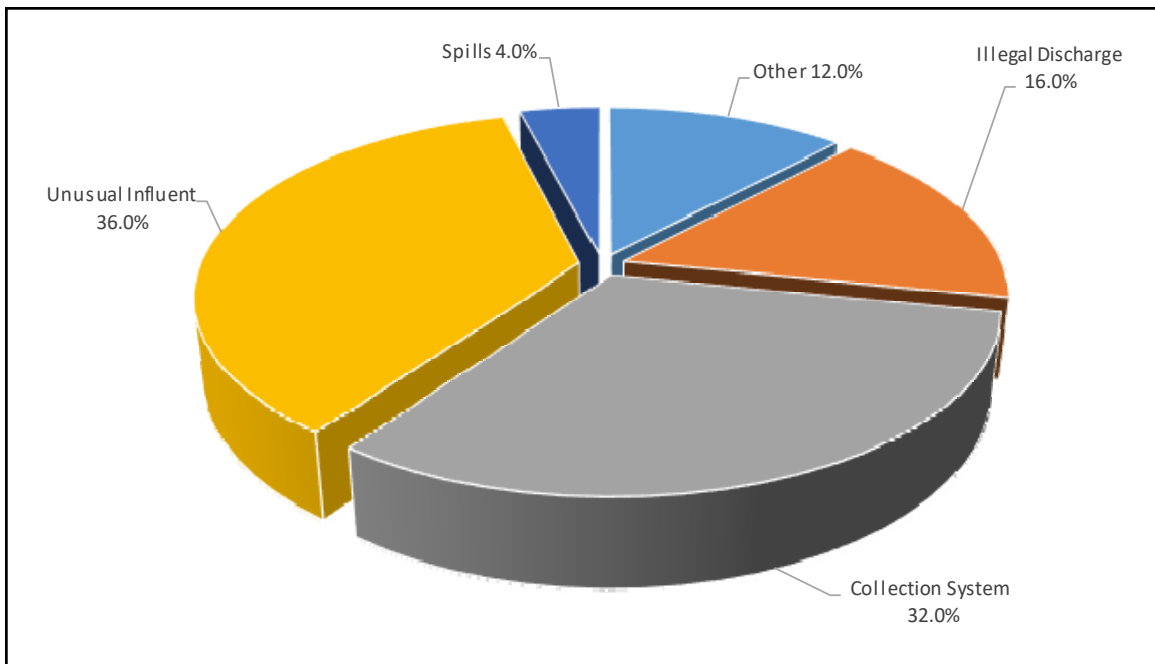


As can be seen from FIGURE 6, the number of investigations and spill response activities fluctuates from year to year, but has been significantly reduced from the number of investigations conducted in the late 1990s. This is attributed to better education of users regarding spill prevention practices, 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 2019. As can be seen from the chart, the majority of the investigations resulted primarily from problems in the collection system and reports of unusual influent, which accounted for nine investigations and nine investigations respectfully. Reports of spills accounted for one investigation and reports of illegal discharge accounted for three investigations. In addition there was one investigation conducted as a result of an incident at the treatment plant and three investigations were conducted in response to fires at permitted companies.

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 25 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 2019 Investigations



Unusual Influent Investigations

Pretreatment staff investigates all incidents of unusual influent at both treatment facilities. During 2019 Pretreatment investigated nine reports of unusual influent two at the Field's Point and seven at the Bucklin Point. Both of Field's Point investigations were as a result of reports of color in the influent. The first report was that the influent was black. Pretreatment staff attempted to track the black influent. The influent to both the Ernest Street and Washington Park pump stations was inspected and appeared normal in color. Upon returning to the plant the influent had returned to normal color. It was determined the source of the black influent may have been from a sewer bypass product. The second report of unusual influent was that pink was observed in the grit tanks and in the primary clarifiers. By the time Pretreatment staff arrived at the plant the influent had returned to normal color. Samples were collected from a primary clarifier. Pretreatment staff contacted and inspected companies with the potential to impact the plant with colored wastewater. The source could not be determined. The analytical results of the samples did not reveal anything unusual. The Field's Point plant was not adversely impacted by either of these reports of unusual influent.



There were seven reports of unusual influent at the Bucklin Point treatment plant. Two of the reports of unusual influent were reports of pH irregularities entering the plant via the Blackstone Valley Interceptor (BVI), one of low pH and one high pH. By the time Pretreatment staff arrived at the plant the pH had returned to normal in both cases, showing both events were of short duration. Two of the investigations of unusual influent were as a result of reports of colored influent. One report was of red and the other was of blue/green. Both incidents were of short duration as the influent returned to normal color by the time the report was made to Pretreatment. Pretreatment staff contacted all companies with the potential to impact the plant with colored influent after each report. The companies were required to submit their color logs. The source of the colored influent in either incident could not be determined. There were two investigations due to reports of odors. The first report was of a fuel odor in the Screenings Building and there was a slight sheen on the BVI influent. Pretreatment measured the atmosphere in the building using a four-gas meter and all levels were normal. The odor and sheen had dissipated. Pretreatment inspected BVI upstream of the plant and the flow appeared normal. The second investigation of odor was of strong solvent odor coming from BVI. Prior to going to the plant Pretreatment staff inspected BVI upstream of the plant. The solvent odor was detected in a manhole at the Bucklin Brook but not further upstream. A mill building was inspected. None of the companies generate process wastewater. However, there was a commercial painting company located in the building with a slop sink and an open floor drain. The company was required to seal the drain and post a prohibited discharge sign at the sink. The final investigation of unusual influent was of foam in BVI. Pretreatment staff inspected BVI upstream of the plant. Samples were collected from a manhole downstream of the Bucklin Brook and on School Street. The samples were shaken and foam was not observed. Pretreatment staff proceeded to the plant and foam was not observed. The Bucklin Point plant was not adversely impacted by any of the reports of unusual influent.

Food Preparation Related Grease Investigations

During 2019 Pretreatment staff conducted six grease related investigations. Five of the investigations occurred in the Field's Point district and one occurred in the Bucklin Point district.

The first Field's Point investigation occurred when Pretreatment staff responded to a report from NBC Interceptor Maintenance (IM) staff stating an accumulation of grease was observed in sewer lines in the area of Empire and Washington Streets area in Providence. Pretreatment staff investigated the area and determined there were six restaurants in this area. All six were inspected. Five of the six restaurants were permitted at the time of the investigation and were in compliance with their permits as their grease removal units were operating properly and their logbooks were up-to-date. The remaining restaurant was in the process of being permitted and was required to install a NBC approved grease removal unit. The second investigation was a result of a report from the City of Providence Department of Public Works (DPW) stating grease was observed in the sewer line located at Miner and Sayles Streets. An investigation of the area revealed it was primarily residential. The third investigation was as a result of a report from Providence DPW stating there was a heavy grease accumulation in the sewer line on Custom House Street. The investigation revealed there were five food service establishments (FSE) in the area with the potential to impact the sewer with grease laden wastewater. All five of the FSEs were permitted at the time of the investigation.

Inspections of the FSEs revealed four of the five were in full compliance with their permits as their grease removal equipment was functioning properly and the logbooks were up-to-date. The remaining facility installed a passive grease removal unit instead of the



automatic that had been approved. A Notice of Violation (NOV) was issued to this facility. The fourth grease related investigation was in response to a report from IM staff stating grease was observed in a sewer line at the intersection of Mineral Spring and Woodruff Avenues in North Providence. A review of the sewer maps for this area show the sewer line begins at this intersection which limits the area of investigation. There were three FSEs with the potential to discharge grease laden wastewater to this line. Two of the three FSEs were permitted at the time of the investigation. These FSEs were in compliance with their permits as the grease removal equipment was functioning properly. The third FSE was in the process of being permitted at the time of the investigation. This facility

had installed a grease removal unit but was not maintaining it. A NOV was issued to the facility requiring the grease removal unit be maintained and functioning properly. The final Field's Point grease related investigation was in response to a report from the City of Providence DPW stating grease accumulated in the sewer line in the DePasquale Area. There were sixteen FSEs in this area with the potential to impact the sewer with grease

laden wastewater. Thirteen of the FSEs were permitted at the time of the investigation. Inspections of these facilities revealed all of them were in compliance with their permits as their grease removal equipment was functioning properly and their grease logbooks were up to-date. The remaining three facilities were also inspected they were required to obtain Wastewater Discharge Permits and install grease removal equipment.

There was one grease related investigation in the Bucklin Point district in 2019. Pretreatment staff responded to a report from the City of East Providence Sewer Department (EPSD) stating there was a heavy grease accumulation in a manhole on a private sewer line located in a plaza at the intersection of Pawtucket and Taunton Avenues. There were three FSEs located in the plaza which were all permitted. Pretreatment staff met with the FSEs and property manager to discuss the issue. After the meeting the FSEs were inspected. All three were complying with their permits as they were maintaining there outdoor passive grease interceptors. The property management company had the manhole and line cleaned out and scheduled routine maintenance to prevent the accumulation of grease.

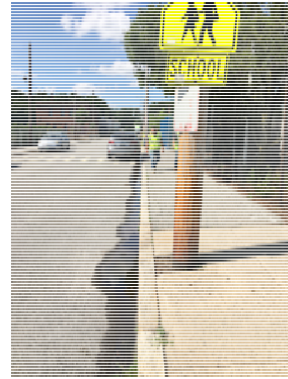
Illegal Dumping and Unpermitted Discharges

Pretreatment staff investigates all reports of illegal dumping and unpermitted discharge to the sewer storm drains and/or NBC receiving waters. In 2019 Pretreatment staff investigated four reports of illegal dumping or unpermitted discharge. Two occurred in the Field's Point district and two occurred in the Bucklin Point district.

The first Field's Point investigation was conducted in response to a report of sewage discharging to the Woonasquatucket River via NBC owned outfall 45 which is located on Promenade Street in Providence. Pretreatment and IM staff inspected the river at the outfall and the flow appeared cloudy and there was a faint sewage odor. Pretreatment and EM staff reviewed the maps of the drainage area to identify and locate all lines with the potential to discharge through this outfall. These lines include storm lines, sanitary lines and lines associated with the CSO structures in the area. The review revealed there were locations in Davis Park where sanitary flow could impact the storm lines if the NBC structures were not functioning properly. In addition the review showed the Pleasant Valley Brook discharges to the river via this outfall. Strategic points on the storm lines were identified for sampling. ES&C and IM staff inspected the lines in and around Davis Park as well as the CSO structures. The NBC structures appeared to be functioning properly. Sample were collected from these structures where possible. The storm lines upstream of Davis Park were inspected and sampled to try to determine if there were any illegal connections. All samples were analyzed for fecal coliform. The analytical results showed high concentrations of fecal coliform in a City of Providence owned storm line on Garfield Street upstream of where the brook discharges into the storm line. The City of Providence was notified of findings of the investigation.



The second Field's Point investigation occurred when Pretreatment staff discovered a discharge to a catch basin located at the corner of Promenade and Rathbone Streets in Providence during the investigation into the sewage discharges to the Woonasquatucket River. The flow had an oil sheen. It was tracked back to a permitted car wash located on Pleasant Valley Parkway. The permit for the facility requires all process water to discharge through an oil and solids/grit separator. The inspection of the facility revealed vehicles were being washed in area where repairs were being done. This wash water was not being directed to the separator. It mixed with other vehicle fluids and flowed off the property to the catch basin. The company was instructed to cease this process and only wash vehicles where wash water discharges to the separator. The company cleaned up oily water on the street. A NOV was issued to the facility for this discharge. In addition the facility was required to install spill control measures.



The first Bucklin Point investigation was as a result of a report from IM staff stating there was a dry weather overflow on John Street in Lincoln. IM staff observed white rags when



they cleaned the line Pretreatment staff determined the area upstream was primarily residential with a large apartment complex. There was one automotive repair shop in the area. The facility was inspected and it was determined the company does not perform any water using operations and the only connection to the sewer was for sanitary discharges. However, white rags were used to wipe hands and equipment. The owner of the company was instructed to train the employees to ensure these rags are disposed of properly and not flushed to the sewer. The second investigation of illegal dumping occurred as

a result of a report from the City of Pawtucket Police Department (PPD) stating they had responded to the corner of Monticello Road and George Bennett Highway when a barrel of an unknown chemical was dumped in a catch basin and was foaming. Upon arrival at the scene there was a faint odor of beer. A sample was collected from the catch basin. Based on the color and odor it was determined the "chemical" was beer. Pawtucket DPW staff flushed the contents of the catch basin to the sewer. The Bucklin Point plant was not adversely impacted.

Fires

Pretreatment staff responded to three reports of fires in 2019. All three fires occurred in the Field's Point district. Two of the fires were at Significant Industrial Users (SIU). The first report of a fire occurred at Monarch Metal Finishing Company located on Aurora Street in Providence. The fire started when the wiring in a hoist in the barrel plating area shorted out. Water was used to put out the fire. None of the plating tanks overflowed due to the fire fighting efforts. All the water applied to the fire was contained onsite and subsequently shipped off site for disposal. The second fire at a SIU occurred at E&M Enterprises, Ltd. located in Johnston. The fire occurred when an electric heater on a gold plating tank ignited. The heat of the fire evaporated the plating solution and only a minimal of water was used to extinguish the fire. The water applied to the fire evaporated. The third fire occurred in a garage at the Equilon Enterprises LLC d/b/a Shell Oil Products US facility on Allens Avenue in Providence. A representative from the company stated a contractor working in the garage caused a small fire. The fire was extinguished using dry chemicals. The Field's Point plant was not impacted by any of the fires.



Wastewater Treatment Plant Response

Pretreatment staff assist Operations staff when incidents occur at the treatment facilities to ensure environmental impacts are minimized. In 2019 there was one incident where



Pretreatment staff provided assistance. The incident occurred at the Field's Point facility when a hypochlorite (hypo) line from the hypo tank farm to the disinfection building broke causing hypo to discharge up through the pavement. The hypo mixed with rain water collected in a puddle on NBC property. Operation staff collected the hypo/rain water on the ground and in the puddle and disposed of it in the plant. The area around the leak was excavated by Operations and IM staff and the leak was repaired. The hypo did not impact the storm water system and did not leave NBC property.

Pass-through and Interference

During 2019 the Pretreatment Section conducted 25 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 2019 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 2019 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.

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 14. 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

EM 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 EM 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 14

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

<u>Parameter</u>	<u>Maximum Daily (Composite daily for 1 day)</u>	<u>Average (10 day)</u>
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

<u>Parameter</u>	<u>Limitation (Max.)</u>
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)

<u>Parameter</u>	<u>Maximum Daily (Concentration Limit mg/l)</u>	<u>Monthly Average (Concentration mg/l)</u>
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

<u>Parameter</u>	<u>Limitation (Max.)</u>
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.

EM 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 EM 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. EM 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 EM 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 2019 by EM 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 EM 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 EM 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, EM staff has work stations in order to prepare required paperwork for sample collection.

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 RIPDES permits.

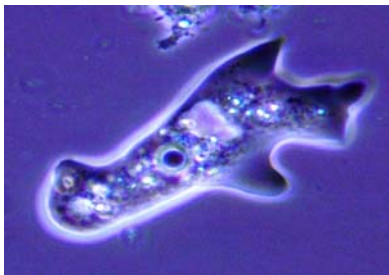


Analytical Laboratory

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 1.0 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.



ICP used at the NBC Laboratory



Amoeba

The Laboratory has a microbiology department dedicated to enterococcus, 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 WQSB 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 all areas, relative humidity control, and a temperature monitoring system to monitor biological sample and preserved analytical sample temperatures.

Between the period of January 1, 2019 through December 31, 2019, NBC staff conducted 153 sampling inspections of industries located within the Field's Point and Bucklin Point districts, resulting in the collection of 1,626 composite and grab samples. These 1,626 samples translated to 161 monitoring reports. Of these 161 monitoring reports, 145 were in full compliance with the NBC standards and 28 were not in compliance, resulting in a user compliance rate of 90.1% based upon NBC analyses. This is an increase from the 83.9% rate of compliance reported for 2018 NBC monitoring results.

The NBC conducted sampling of 66 SIUs and seven non-significant user facilities in the two NBC districts during 2019. Of the 75 facilities sampled by the NBC, 41 facilities were classified as categorical industries at the time of the sampling event. There were 25 firms classified as significant non-categorical facilities when sampled by the NBC during 2019.

Computer printouts of the 2019 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 identified 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 1,704 wastewater monitoring reports for the period from January 1, 2019 through December 31, 2019. For this period, the industrial and commercial users actually submitted 2,133 sample results, 2,012 of which were in full compliance with NBC and EPA standards. This is a user self monitoring report rate of compliance of 94.3%. The users submitted 25.2% more analyses than required by permits due to the NBC requirement to conduct weekly sampling once non-compliance has occurred.

TABLE 15 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, 2019 through December 31, 2019. TABLE 16 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 15 and 16 is shown graphically in FIGURES 8 and 9. TABLE 17 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 95.9%, NBC results indicate a compliance rate of 89.2% for this class of users.

TABLE 15

**Narragansett Bay Commission
Field's Point and Bucklin Point Districts**

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

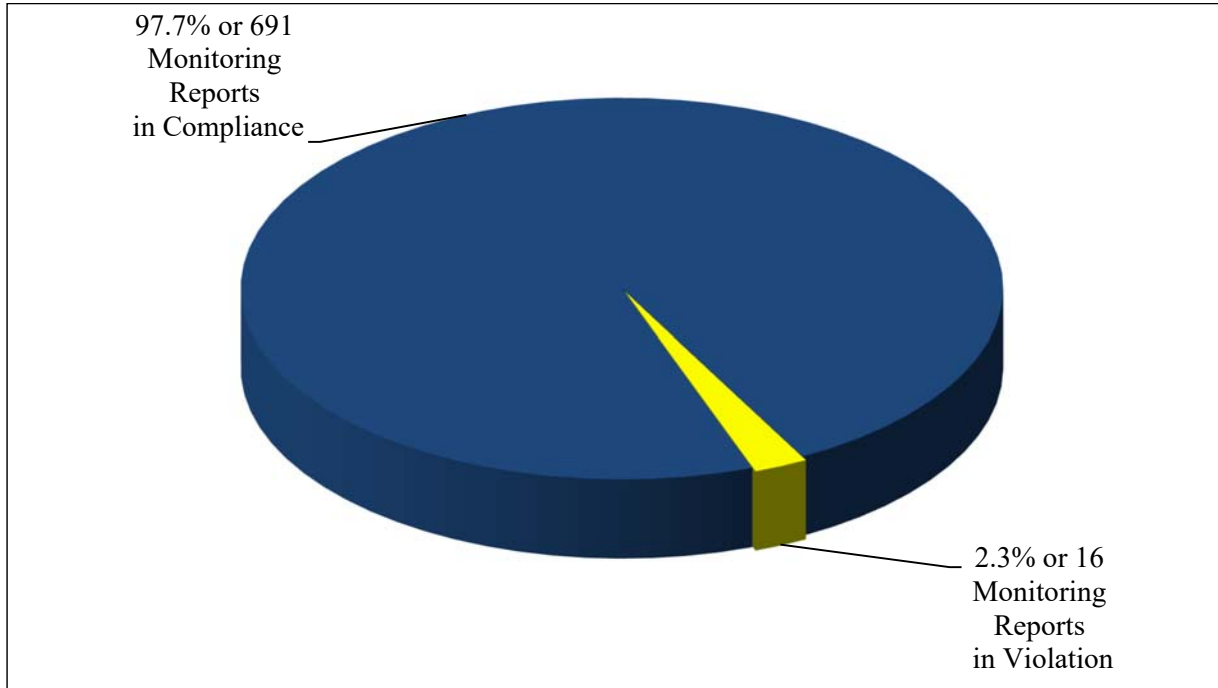
January 1, 2019 - December 31, 2019

<u>User Self-Monitoring Results</u>	Categorical	Non-Categorical	Totals
Total Monitoring Reports Required	544	1,160	1,704
Total Monitoring Reports Submitted	615	1,518	2,133
Total Monitoring Reports In Compliance	608	1,404	2,012
Total Monitoring Reports Not In Compliance	7	114	121
 <u>NBC Monitoring Results</u>			
Total Monitoring Reports Collected	92	69	161
Total Monitoring Reports In Compliance	83	62	145
Total Monitoring Reports Not In Compliance	9	7	16
 <u>All Results</u>			
Total Monitoring Reports Reviewed	707	1,587	2,294
Total Monitoring Reports With Violations	16	121	137
Total Monitoring Reports In Compliance	691	1,466	2,157
Total Users Sampled	41	447	488
Total Users With Violations	13	48	61
Total Users Without Violations	28	399	427

FIGURE 8

**2019 Rates of Compliance for Categorical and Non-Categorical Users
Field's Point & Bucklin Point Districts**

**Categorical User Analyses
Total Number of Monitoring Reports = 707**



**Non-Categorical User Analyses
Total Number of Monitoring Reports = 1,587**

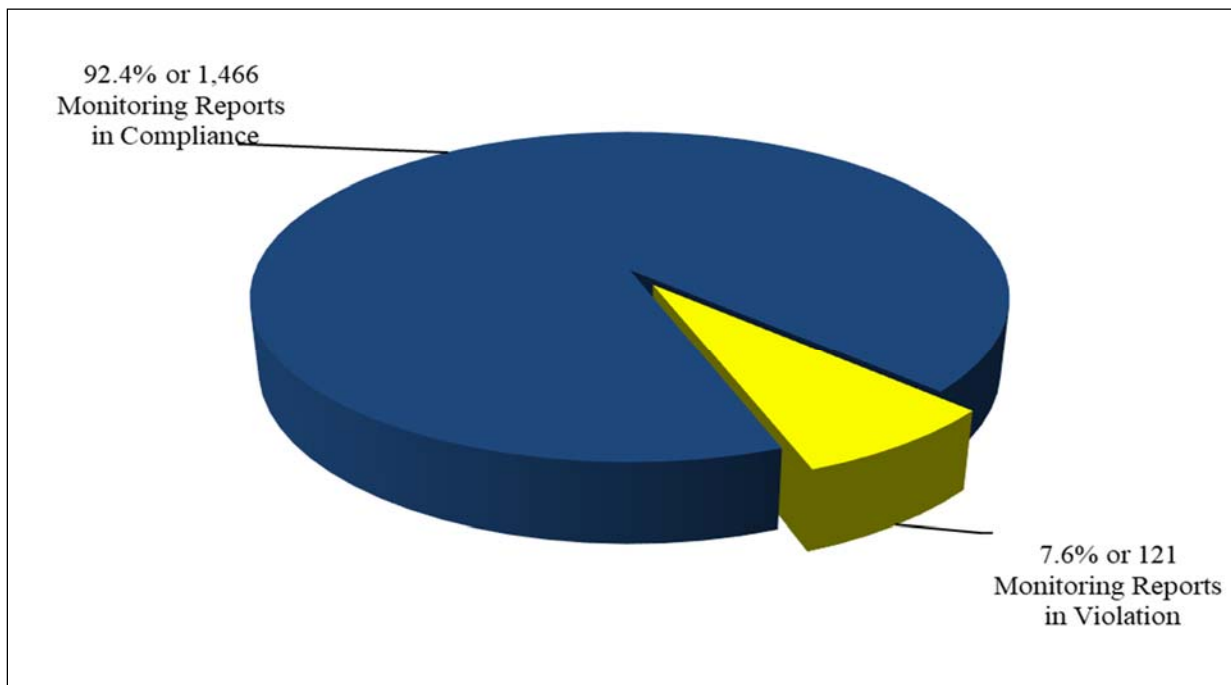


TABLE 16

**Narragansett Bay Commission
Field's Point and Bucklin Point Districts**

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

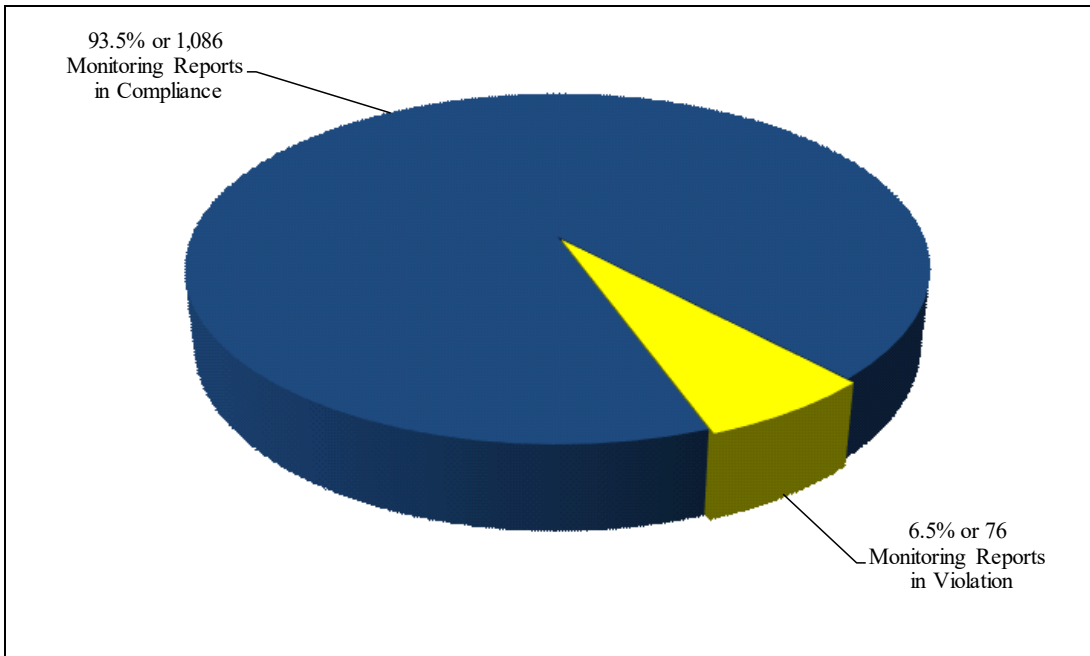
January 1, 2019 - December 31, 2019

<u>User Self-Monitoring Results</u>	Significant Users	Non-Significant Users	Totals
Total Monitoring Reports Required	747	957	1,704
Total Monitoring Reports Submitted	940	1,193	2,133
Total Monitoring Reports In Compliance	901	1,111	2,012
Total Monitoring Reports Not In Compliance	39	82	121
<u>NBC Monitoring Results</u>			
Total Monitoring Reports Collected	148	13	161
Total Monitoring Reports In Compliance	132	13	145
Total Monitoring Reports Not In Compliance	16	0	16
<u>All Results</u>			
Total Monitoring Reports Reviewed	1,088	1,206	2,294
Total Monitoring Reports With Violations	55	82	137
Total Monitoring Reports In Compliance	1,033	1,124	2,157
Total Users Sampled	66	422	488
Total Users With Violations	20	41	61
Total Users Without Violations	46	381	427

FIGURE 9

**2019 Rates of Compliance for Significant and Non-Significant Users
Field's Point & Bucklin Point Districts**

**Significant User Analyses
Total Number of Monitoring Reports = 1,088**



**Non-Significant User Analyses
Total Number of Monitoring Reports = 1,304**

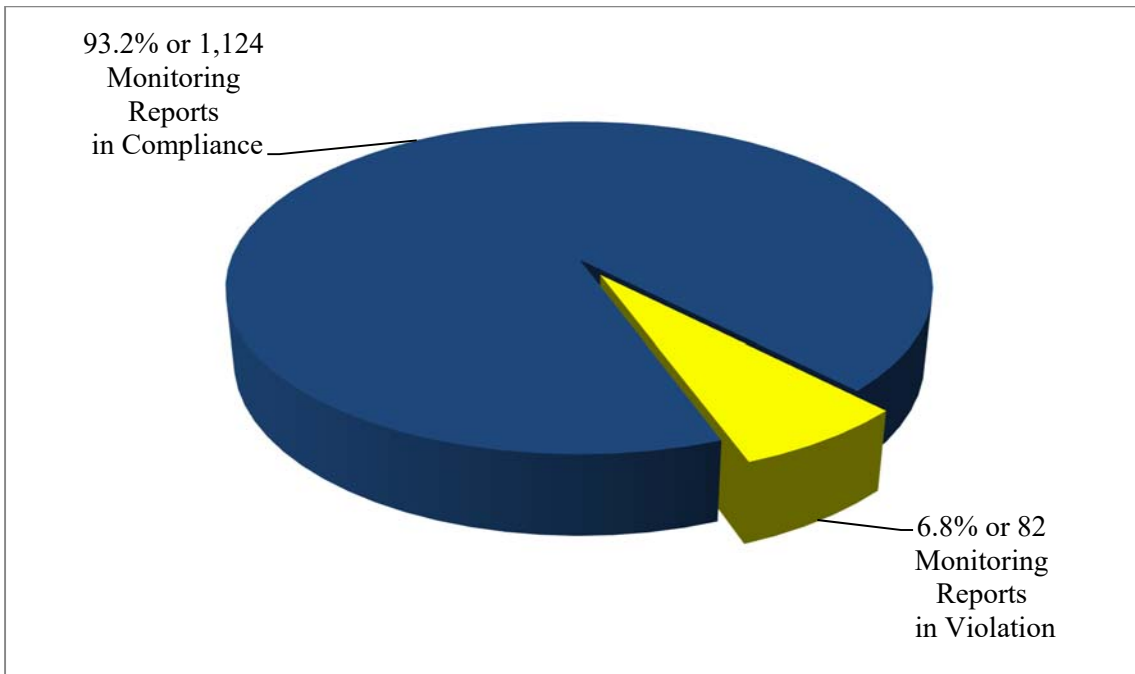


TABLE 17

**Narragansett Bay Commission
Field's Point and Bucklin Point Districts**

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

January 1, 2019 - December 31, 2019

	User Self-Monitoring	NBC Monitoring	All Results
<u>Significant Users</u>			
Compliance Rate	95.9%	89.2%	94.9%
Non-Compliance Rate	4.1%	10.8%	5.1%
<u>Non-Significant Users</u>			
Compliance Rate	93.1%	100%	93.2%
Non-Compliance Rate	6.9%	0%	6.8%
<u>Categorical Users</u>			
Compliance Rate	98.9%	90.2%	97.7%
Non-Compliance Rate	1.1%	9.8%	2.3%
<u>Non-Categorical Users</u>			
Compliance Rate	92.5%	89.9%	92.4%
Non-Compliance Rate	7.5%	10.1%	7.6%
<u>All Users</u>			
Compliance Rate	94.3%	90.1%	94.0%
Non-Compliance Rate	5.7%	9.9%	6.0%

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 93.5% in 2018 and 94.9% in 2019. There was a 6.7% 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 is slightly greater at 8.7%. User self monitoring reports submitted by categorical users indicated full compliance 98.9% of the time, while NBC monitoring found categorical users to be in compliance 90.2% of the time for 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
2019 Comparison of Compliance Rates for
Self-Monitoring and NBC Monitoring Reports

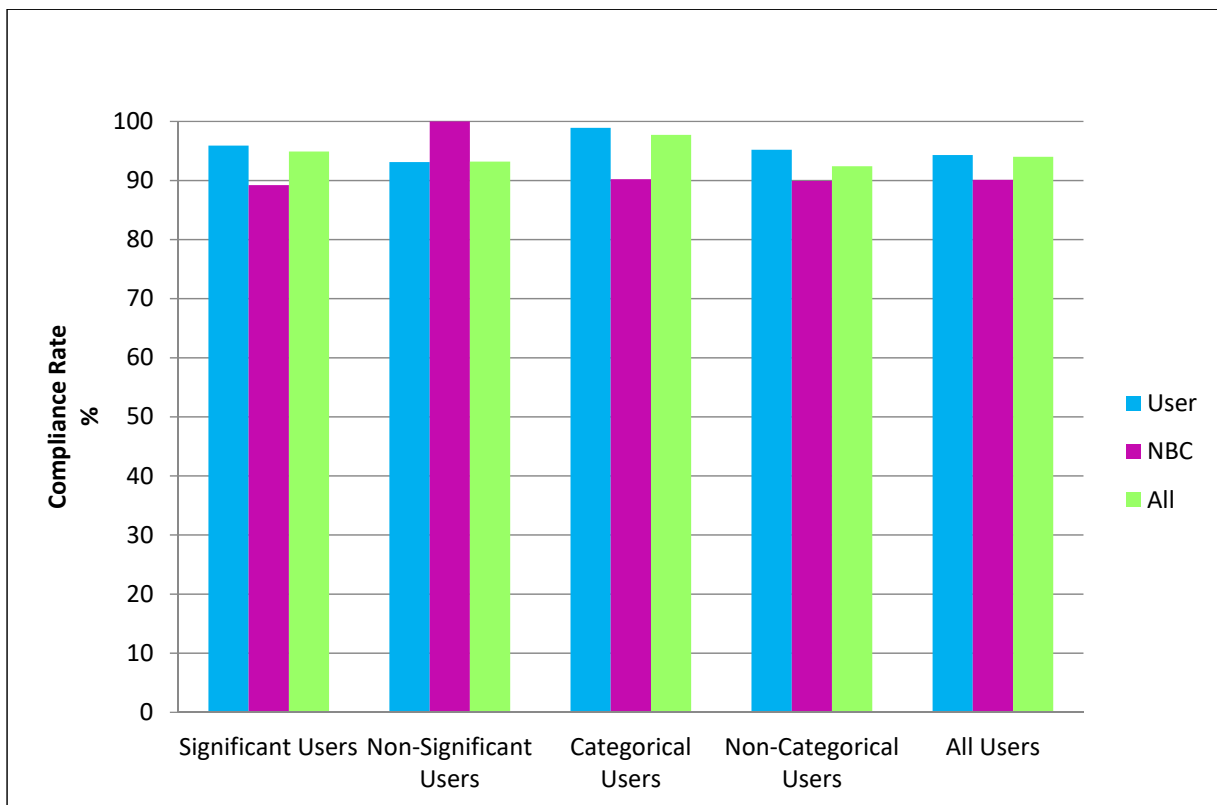


TABLE 18 provides a comparison of the compliance rates for different classes of users located in the Field's Point and Bucklin Point districts. The compliance rates for each class of users in both districts were similar. The overall rate of compliance for Field's Point users was 94.0%, while it was 94.1% in Bucklin Point.

The Field's Point categorical users were in full compliance for 97.0% of the sampling events at their facilities in 2019. This compliance rate is greater than the 94.2% compliance rate in 2018. The Bucklin Point categorical users were in full compliance for 98.7% of the sampling event at their facilities in 2019. This compliance rate is an increase from the 97.3% in 2018. SIUs in the Field's Point district had a rate of compliance of 93.6% lower than the 96.4% SIU compliance rate observed in the Bucklin Point district.

As can be seen from TABLE 18, categorical users in Bucklin Point had the highest rate of compliance, 98.7%, while significant users located in the Field's Point district had the highest rate of non-compliance, 8.7%. The rate of user compliance for all users in both districts slightly decreased to 94.0% in 2019 when compared to 2018, at 94.7%.

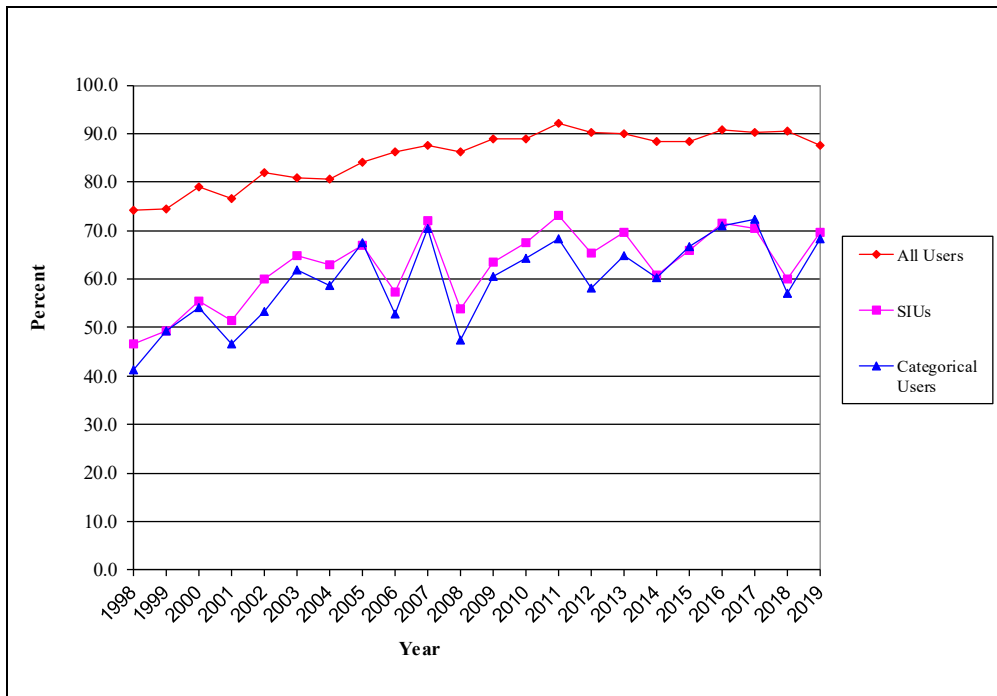
TABLE 18
Narragansett Bay Commission
Comparison of Compliance Rates
Between Field's Point and Bucklin Point Districts
for All Monitoring Results

January 1, 2019 - December 31, 2019

	Field's Point District	Bucklin Point District	Both Districts
<u>Significant Users</u>			
Compliance Rate	93.6%	96.4%	94.9%
Non-Compliance Rate	6.4%	3.6%	51.1%
<u>Non-Significant Users</u>			
Compliance Rate	94.1%	91.3%	93.2%
Non-Compliance Rate	5.9%	8.7%	6.8%
<u>Categorical Users</u>			
Compliance Rate	97.0%	98.7%	97.7%
Non-Compliance Rate	3.0%	1.3%	2.3%
<u>Non-Categorical Users</u>			
Compliance Rate	92.7%	91.9%	92.4%
Non-Compliance Rate	5.9%	5.5%	5.6%
<u>All Users</u>			
Compliance Rate	94.0%	94.1%	94.0%
Non-Compliance Rate	6.0%	5.9%	6.0%

TABLE 19 provides an analysis of the percentage of firms in each user class with perfect compliance records for effluent monitoring occurring during 2019. This analysis indicates that 68.3% of categorical users and 69.7% of significant users had perfect compliance records for all effluent parameters and sampling events. The compliance rates for both of these user classes increase when compared to 2018, which were 57.1% and 60.0% respectively. Non-significant users had the highest percentage of firms with perfect compliance records, 90.3%. During 2019, of the 488 firms that sampled their waste stream, 427 firms or 87.5% 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 87.5% in 2019.

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 2019 can be attributed to NBC resampling requirements, open and prompt communications with users and to educational efforts by the Pretreatment and TAC staff regarding EPA and NBC requirements. In addition to educating users, the Pollution Prevention staff from the TAC Section 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 19

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, 2019 - December 31, 2019

	% Firms Without Effluent Violations*	% Firms With Effluent Violations
Categorical Users	68.3%	31.7%
Non-Categorical Users	89.3%	10.7%
Significant Users	69.7%	30.3%
Non-Significant Users	90.3%	9.7%
All Users	87.5%	12.5%

***Excludes pH Parameter Violations.**

Of the 2,294 analytical reports reviewed during 2019, there were 137 reports that indicated non-compliance with one or more of the NBC or EPA effluent parameters (excluding pH). Of these 137 non-compliant sample reports, 55 were of samples collected from 20 SIU facilities and 82 non-compliant samples were collected from 22 non-significant facilities.

Two of the 20 SIUs that had effluent violations during 2019 had five or more effluent parameter violations during the report period. In fact, of the 4,621 various pollutant parameters tested for by SIUs, these four firms were responsible for 30 parameter violations out of a total of 57 parameter violations reported by all significant users during 2019. These two firms accounted for 52.6% 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 two firms and the current status of each of these users is provided in TABLE 20.

TABLE 20
Narragansett Bay Commission
Status of Significant Users With 5 or More
Parameter Violations
January 1, 2019 - December 31, 2019

<u>Company Name</u>	<u>Violations</u>	<u>User Status</u>
Ecological fibers, Inc.	8	This Bucklin Point printing firm experienced eight zinc violations. Two of the violations occurred during NBC sampling events. The firm determined its coatings contain high concentrations of zinc. The wash water generated from the coating operations has been disposed of off-site for the past year. In response to the violations the firm conducted an investigation and determined employees may not be properly segregating zinc bearing wastewater from non-zinc bearing wastewater. The employees have been retrained. The firm has completed resampling and is now in compliance with NBC discharge limitations.
Providence Specialty Products, Inc.	22	This Field's Point cheese manufacturing firm experienced twenty-two total oil and grease violations. The firm attributed the violations to not adequately capturing byproducts that are high in milk fats. In early 2019 the firm installed equipment to capture these by products. However the continued to exceed the total oil and grease limitation. An Administrative Order (AO) was issued to the firm in December 2019. The AO incorporated these parameter violations as well as pH violations failing to submit reports on time, and failing to notify NBC of discharge violations within twenty-four (24) hours of becoming aware of violations. A status conference will be held in January Further discussion on the AO can be found in CHAPTER VI.

2019 Industrial User Compliance Status Summary

During 2019, 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 1,629 NOV were issued in 2019. 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 and summary of the reports and requirements that were not submitted by the due date can be found in ATTACHMENT VOLUME II, SECTION 9. A summary of NBC Enforcement Actions, including the penalties assessed, is also provided in CHAPTER VI.

Industrial Surveillance Manhole Monitoring Program

During 2019, EM staff conducted sampling of an average of seven 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. EM staff analyzes each of the 24 sample bottles for pH and any unusual wastewater characteristics.

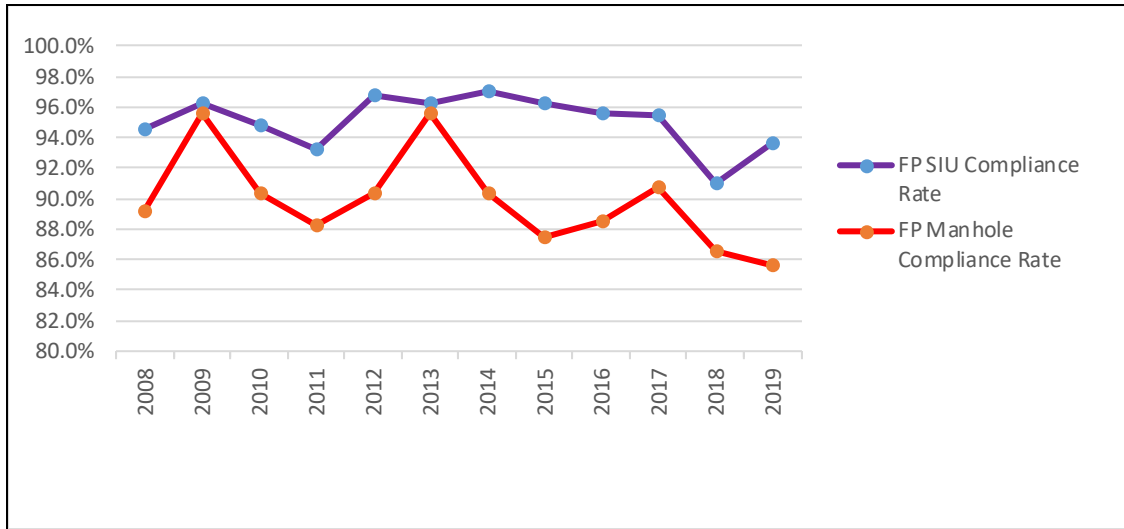


Should any unusual conditions be observed, one or possibly all of the 24 samples would be analyzed separately. If no unusual characteristics are observed, an equal volume aliquot of each of the 24 samples is composited into two separate samples for laboratory analyses for metals and cyanide. After obtaining 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 2019, the NBC successfully sampled a total of 240 industrial manhole sampling events at manholes located throughout the two districts. In addition to collecting industrial manhole samples, 36 sampling events were conducted at residential manholes. In addition, 13 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 289 monitoring events were conducted at manholes in 2019. This is decrease from the 325 monitoring events conducted at manholes in 2018.

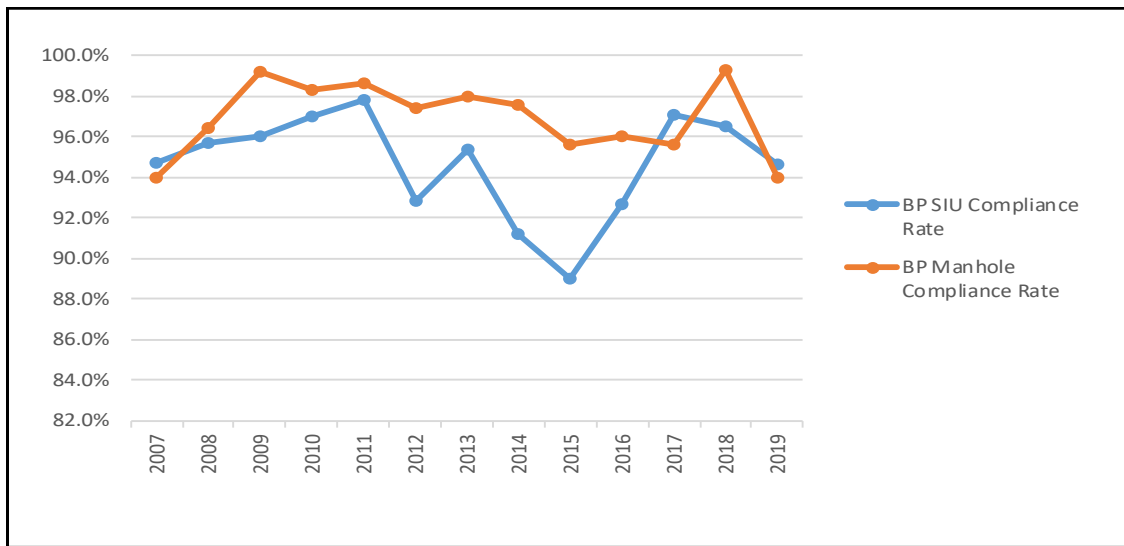
EM staff conducted 140 manhole monitoring events from industrial surveillance manholes in Field's Point during 2019. Of the 140 manhole monitoring events, 120 or 85.7% were in compliance with NBC discharge limitations. As can be seen in FIGURE 12 this compliance rate is lower than the compliance rate for sampling within Field's Point SIU facilities in 2019, which was 93.6%. 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 2007 - 2019



EM staff conducted 100 monitoring events from industrial surveillance manholes in Bucklin Point during 2019. Of the 100 manhole monitoring events, 94 or 94.0% of the events were in compliance with NBC discharge limitations. As can be seen in FIGURE 13 this compliance rate is virtually the same than the compliance rate for samples collected within Bucklin Point SIU facilities in 2019, which was 94.6%.

FIGURE 13
Bucklin Point SIU vs Manhole Compliance Rates 2007 – 2019



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 2019 are provided in ATTACHMENT VOLUME II, SECTION 7.

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 2019 are provided in ATTACHMENT VOLUME II, SECTION 7.

INDUSTRIAL SURVEILLANCE MANHOLE VIOLATIONS

FIELD'S POINT DISTRICT

Industrial Surveillance Manhole 07

Industrial Surveillance Manhole 07 is located on Ellenfield Street in Providence. The manhole is located downstream of the Ellenfield industrial area which includes many electroplating and metal finishing firms. On June 27, 2018 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. The companies in the area were inspected. Continued industrial manhole monitoring will be conducted by NBC personnel in 2020 to monitor the compliance status of this area.

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 December 11, 2019 the concentration of copper in Industrial Surveillance Manhole 08A was in excess of the NBC discharge limitation of 1.20 ppm. A sample was not collected from the upstream manhole, and therefore, the firm was not issued a Notice of Violation. However, the firm was required to review its operations and submit a report regarding its potential contribution to the cause of the high copper concentration. The firm investigated its operations but could not determine a cause for the high copper concentration. Continued industrial manhole monitoring will be conducted by NBC personnel in 2020 to monitor the compliance status of this company.

Industrial Surveillance Manholes 09A, 09B, and 09C

Industrial Surveillance Manholes 09A, 09B and 09C are located on Georgia Street in Providence downstream and upstream of Technodic, Inc., which conducts metal finishing operations. On May 8, 2019 the concentration of copper in Industrial Surveillance Manholes 09A and 09C was in excess of the NBC discharge limitation of 1.20 ppm. The flow in upstream manhole 09C is low to negligible, and excess grit has been observed in the past. Therefore, the high copper concentration in both manhole 09A and 09C was most likely caused by grit being disturbed when the sampling devices were installed. Continued industrial manhole monitoring will be conducted by NBC personnel in 2020 to monitor the compliance status of this company.

Industrial Surveillance Manholes 11A, 11B & 11C

Industrial Surveillance Manhole 11A is located on Virginia Street in Providence downstream of Monarch Metal Finishing, Inc., which conducts metal finishing operations. Manholes 11B & 11C are located on Toronto Street in Providence downstream and upstream of Monarch Metal Finishing Inc. On April 10, 2019 the concentrations copper and zinc in Industrial Surveillance Manhole 11A were in excess of the NBC discharge limitation of 1.20 ppm and 2.61 ppm respectively. Since Surveillance Manhole 11A was the only manhole sampled during this monitoring event, a Notice of Violation was not issued. The firm was inspected and indicated that wastewater piping was cleaned on that date, however they did not believe that would cause the elevated concentrations of metals. Continued industrial manhole monitoring will be conducted by NBC personnel of these manholes in 2020 to monitor the compliance status of this company.

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 Co., Inc., which conducts metal finishing operations. On October 30, 2019 the concentration of copper in Industrial Surveillance Manhole 23A was in excess of the NBC discharge limitation of 1.20 ppm. The firm was issued a Notice of Violation which required a report detailing the cause of the high cyanide concentration to be submitted. The firm attributed violation to hollow pieces retaining more plating solution causing rinse water to have higher than usual concentrations of metals. The firm indicated that when plating similar items in the future, they would adjust rinsing practices as necessary. Continued industrial manhole monitoring will be conducted by NBC personnel of these manholes in 2020 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, LLC, which conducts metal finishing operations. On March 27, 2019 and December 11, 2019, the concentration of zinc in Industrial Surveillance Manhole 53A was in excess of the NBC discharge limitation of 2.61 ppm. On December 11, 2019 and December 18, 2019, the concentration of copper was in excess of the NBC discharge limitation of 1.20 ppm. The firm was issued a Notice of Violation in each instance which required reports detailing the cause of the high metals concentration to be submitted. The firm attributed both violations to an employee not following the proper plating processes. The responsible employee was retrained in each instance. Continued industrial manhole monitoring will be conducted by NBC personnel of these manholes in 2020 to monitor the compliance status of this company.

Industrial Surveillance Manholes 65A & 65B

Industrial Surveillance Manholes 65A and 65B are located on Addison Place in Providence downstream and upstream of International Chromium Plating, which conducts metal finishing operations. On April 4, 2019 the concentration of chromium in Industrial Surveillance Manhole 65A was in excess of the NBC discharge limitation of 2.77 ppm. The firm was issued a Notice of Violation which required a report detailing the cause of the high chromium concentration to be submitted. The firm attributed violation to larger than normal flow of chromates from rinse tanks. The firm indicated it would review rinsing techniques and would more closely monitor flows during times of heavier workload. Continued industrial manhole monitoring will be conducted by NBC personnel of these manholes in 2020 to monitor the compliance status of this company.

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 February 6, 2019 and December 18, 2019, the concentration of nickel in Industrial Surveillance Manhole 111A was in excess of the NBC discharge limitation of 1.62 ppm. The firm was issued a Notice of Violation for the February 6, 2019 event which required a report detailing the cause of the high concentrations to be submitted. The firm attributed the February 6, 2019 violation on the ion exchange columns being overdue for regeneration and indicated that it would ensure columns are regenerated more frequently in the future. A sample was not collected from the upstream manhole during the December 18, 2019 monitoring event, and therefore, the firm was not issued a Notice of Violation. However, the firm was required to review its operations and submit a report regarding its potential contribution to the cause of the high nickel concentration. The firm indicated that temporary employees were not trained properly in rinsing techniques and that these employees would be trained properly in the future. Continued industrial manhole monitoring will be conducted by NBC personnel in 2020 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 July 10, 2019 the concentration of zinc in Industrial Surveillance Manhole 123A was in excess of the NBC discharge limitation of 2.61 ppm. On December 18, 2019 the concentrations of copper, nickel, and zinc were in excess of the NBC discharge limitations of 1.20 ppm, 1.62 ppm, and 2.61 ppm, respectively. The firm was issued Notices of Violation in each instance which required a report detailing the cause of the metals concentrations to be submitted. The firm attributed the July 10, 2019 violation to poor rinsing techniques and indicated employees would be retrained. The December 18, 2019 violation was attributed to a leak in the tank heating system allowing concentrated plating solution being discharged in the boiler blowdown and overwhelming the pretreatment system. The leak was repaired, and the firm was required to keep a visual log of each boiler blowdown. Continued industrial manhole monitoring will be conducted by NBC personnel in 2020 to monitor the compliance status of this company.

Industrial Surveillance Manholes 151A & 151B

Industrial Surveillance Manholes 151A and 151B are located on Waterman Avenue in North Providence downstream and upstream of Induplicate, LLC, which conducts metal finishing operations. On August 28, 2019 the concentration of nickel in Industrial Surveillance Manhole 151A was in excess of the NBC discharge limitations of 1.62 ppm. The firm was issued a Notice of Violation which required a report detailing the cause of the high concentrations to be submitted. The firm attributed a potential cause of the violation to a new tin cobalt line and as a result changed a running rinse to a still rinse which is not discharged. Continued industrial manhole monitoring will be conducted by NBC personnel in 2020 to monitor the compliance status of this company.

Industrial Surveillance Manholes 181A & 181B

Industrial Surveillance Manholes 181A and 181B are located on Carolina Avenue in Providence downstream and upstream of International Insignia Corporation, which conducts metal finishing operations. On May 22, 2019 the concentration of nickel in Industrial Surveillance Manhole 181A was in excess of the NBC discharge limitation of 1.62 ppm. On May 22, 2019, September 18, 2019, and October 2, 2019 the concentration of copper was in excess of the NBC discharge limitations of 1.20 ppm. The firm was issued a Notice of Violation in each instance which required a report detailing the cause of the high concentration to be submitted. The firm attributed the May 22, 2019 to poor rinsing techniques. The firm could not determine a potential cause for the September 18, 2019 and October 2, 2019 violations. The firm was inspected on December 4, 2019 to discuss this issue. Continued industrial manhole monitoring will be conducted by NBC personnel in 2020 to monitor the compliance status of this company.

Industrial Surveillance Manholes 204A & 204B

Industrial Surveillance Manholes 204A and 204B are located on Aldrich Street in Providence downstream and upstream of Metallurgical Solutions, Inc., which conducts metal finishing operations. On July 10, 2019 the concentration of copper, lead, and zinc in Industrial Surveillance Manhole 181B, the upstream manhole, was in excess of the NBC discharge limitations of 1.20 ppm, 0.60 ppm, and 2.61 ppm. The area upstream of Metallurgical Solutions, Inc. was investigated for potential sources of the high concentrations of metals, and an automotive facility was found, Uptown Auto Spa, which was required to apply for a permit. Continued industrial manhole monitoring will be conducted by NBC personnel in 2020 to monitor the compliance status of this 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 April 17, 2019 the concentration of zinc in Industrial Surveillance Manhole 14A was in excess of the NBC discharge limitation of 1.67 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. It was found that the upstream manhole typically has little to no flow and there is solids and grit that could be contaminating the sample. Continued industrial manhole monitoring will be conducted by NBC personnel in 2020 to monitor the compliance status of this area.

Industrial Surveillance Manholes 37A & 37B

Industrial Surveillance Manholes 37A and 37B are located on Mineral Spring Avenue in Pawtucket upstream and downstream of Providence Metallizing Company Inc., which conducts metal finishing operations. On May 1, 2019, the concentration of silver in Industrial Surveillance Manhole 37B was in excess of the NBC discharge limitation of 0.40 ppm. The company was inspected and stated that they had not discharged on the day in question. They also indicated that a polishing company was operating in the building as well. It was determined that the polishing company, Precision Polishing and Ornamentals, Inc., which operates a zero process wastewater discharge recycle system, was most likely the source. The company had recently done a clean-up where floor wash water potentially contaminated with silver was discharged into a mop sink. Continued industrial manhole monitoring will be conducted by NBC personnel in 2020 to monitor the compliance status of these companies.

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 January 9, 2019 and November 26, 2019, the concentrations of copper and nickel in Industrial Surveillance Manhole 92B were in excess of the NBC discharge limitation of 1.20 ppm and 1.62 ppm respectively. On December 23, 2019 the concentration of copper was in excess of the NBC discharge limitation of 1.2 ppm. The firm was issued a Notice of Violation in each instance which required a report detailing the cause of the high concentrations to be submitted. The firm attributed the January 9, 2019 violation to solids build up in the discharge line which was being cleaned around the time of the monitoring event. The November 26, 2019 violation was attributed to a pump failure which caused a backup that flooded a trench and ultimately resulted in an improperly treated discharge. Continued industrial manhole monitoring will be conducted by NBC personnel in 2020 to monitor the compliance status of this company.

Industrial Surveillance Manholes 124B & 124C

Industrial Surveillance Manholes 124B and 124C are located on Highland Corporate Drive in Cumberland upstream and downstream of Tedor Pharma Inc., which conducts pharmaceutical operations. On June 12, 2019 the concentration of zinc 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 zinc concentration to be submitted. The firm could not identify the source of the violation. Continued industrial manhole monitoring will be conducted by NBC personnel in 2020 to monitor the compliance status of this company.

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 EM staff work together to find the source when the results indicate non-compliance with NBC discharge limitations. In 2019, 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 2020.

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

NBC Impact on the Control of Toxics and Incompatible Wastes

The NBC continues to improve receiving water quality by meeting and exceeding compliance with RIPDES discharge standards, 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 such discharges. 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 2019 monitoring initiatives performed by Environmental Monitoring (EM), 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 EM, Laboratory, Technical Analysis and Compliance (TAC), Operations, and Engineering sections to control toxics from entering and impacting the sewer system. EM 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 September 29, 2017, the DEM issued new RIPDES permits to the Field's Point, RI0100315, and Bucklin Point, RI0100072, treatment facilities. These permits became effective on December 1, 2017. Of significant interest was the removal and addition of several pollutants to the monitoring requirement imposed by the permits. TABLE 21 details the mandated changes in pollutants required to be monitored for each facility:

**TABLE 21
Pollutant Changes in 2017 RIPDES Permits**

Field's Point WWTF	
Pollutant Added to RIPDES Permit Monitoring	Pollutant Removed from RIPDES Permit Monitoring
Aluminum	Silver
Arsenic	Mercury
Cadmium	Biochemical Oxygen Demand (BOD)
Hexavalent Chromium	Wet Weather Outfall BOD
Lead	Wet Weather Outfall pH
Carbonaceous Biochemical Oxygen Demand (CBOD)	
Enterococci	
Wet Weather Outfall CBOD	

TABLE 21
(cont'd)
Pollutant Changes in 2017 RIPDES Permits

Bucklin Point WWTF	
Pollutant Added to RIPDES Permit Monitoring	Pollutant Removed from RIPDES Permit Monitoring
Aluminum	Silver
Cadmium	Mercury
CBOD	BOD
Enterococci	Wet Weather Outfall BOD
Lead	Wet Weather Outfall pH
Wet Weather Outfall CBOD	
Wet Weather Outfall Enterococci	

The removal of a parameter from a RIPDES permit, or a change to “monitor only” status is a clear indication that the levels discharged of the pollutant are no longer a concern for the DEM. Often this can be directly attributed to effective efforts by Pretreatment, TAC, Laboratory, Operations, and EM staff. The timely collection of samples by EM, low-level trace analysis by the Laboratory, effective regulation of industry by Pretreatment, technical assistance provided to industry by TAC, and effective treatment performed by Operations are the key components of an efficient wastewater treatment organization.

The new permits included limits for copper and nickel at Bucklin Point that were substantially lower than the interim limits previously in place for these metals; the NBC could not reliably attain these new limits. The NBC appealed these and several other conditions of both the RIPDES permits, and a consent order was issued on July 19, 2018 to temporarily stay these conditions. A formal consent agreement (RIA-424) was then negotiated, with final issuance on September 5, 2018, and further amendment on January 8, 2019, and included the following changes to the original permit conditions:

Field’s Point:

- CBOD: Continued temporary stays on seasonal limits pending permit modification
- TSS: Continued temporary stays on seasonal limits pending permit modification
- Wet Weather Enterococci: Daily maximum limit of 276 cfu/100 mL changed to monitor only
- Wet Weather Total Residual Chlorine: Daily maximum limit of 20 ug/L changed to monitor only

Bucklin Point:

- CBOD: Continued temporary stays on seasonal limits pending permit modification
- TSS: Continued temporary stays on seasonal limits pending permit modification

- Copper: Interim monthly average and daily maximum limits of 29.8 ug/L and 86.1 ug/L were continued from previous Consent Agreement RIA-330; replacing 2017 permit limits of 6.5 ug/L and 6.5 ug/L, respectively
- Nickel: Interim monthly average limit of 25.0 ug/L replaced permit limit of 14.3 ug/L
- Wet Weather Enterococci: Daily maximum limit of 276 cfu/100 mL changed to monitor only
- Wet Weather Total Residual Chlorine: Daily maximum limit of 20 ug/L changed to monitor only

The wet weather enterococci and Total Residual Chlorine (TRC) limit changes and the interim limits for copper and nickel at Bucklin Point are temporary and will be reevaluated by the DEM following receipt of data summaries from the NBC.

A formal Permit Modification was issued to the NBC and became effective on April 1, 2019. This modification set new seasonal limits for TSS and CBOD to replace the stayed limits from the 2017 permits. The final changes are as follows:

Field's Point:

- CBOD: May – October limits:
 - Average monthly load from 5,421 lbs/day to 10,842 lbs/day
 - Maximum daily load from 8,132 lbs/day to 16,263 lbs/day
 - Average monthly and average weekly concentration from 10 mg/L to 20 mg/L
 - Maximum daily concentration from 15 mg/L to 30 mg/L
- TSS: May – October limits:
 - Maximum daily load from 16,263 lbs/day to 24,395 lbs/day
 - Maximum daily concentration from 30 mg/L to 45 mg/L
 - All other TSS limits remain unchanged

Bucklin Point:

- CBOD: May – October limits:
 - Average monthly load from 2,585 lbs/day to 5,171 lbs/day
 - Maximum daily load from 3,878 lbs/day to 7,756 lbs/day
 - Average monthly and average weekly concentration from 10 mg/L to 20 mg/L
 - Maximum daily concentration from 15 mg/L to 30 mg/L
- TSS: May – October limits:
 - Maximum daily load from 7,756 lbs/day to 11,634 lbs/day
 - Maximum daily concentration from 30 mg/L to 45 mg/L
 - All other TSS limits remain unchanged

Sample Collection at the Wastewater Treatment Facilities

All sample collection, preservation, and storage at the NBC treatment facilities is performed with strict adherence to EPA protocols. As detailed in the 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 chromium, copper, lead, mercury, nickel, silver, and zinc in the influent and effluent. Most metals and cyanide measurements are required twice per week at both plants; some metals are only sampled monthly. During 2019, EM staff collected all permit-required 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. These samples are combined based upon the flow percentages for the sample collection period. Influent cyanide samples are collected twice per week from the two Bucklin Point interceptor locations and consist of nine separate grab samples from each location. These samples are combined flow proportionally in the same way as the metals and conventional pollutant composite collections.

In December 2017, the NBC Laboratory began analyzing influent metals on instruments with lower detection limits than in the past. Previously, several influent metals, particularly cadmium, chromium, lead, and silver at Field's Point, and cadmium, chromium, lead, nickel, and silver at Bucklin Point were often analyzed at their detection limits. This resulted in the inability to properly identify the actual levels of these pollutants that were coming into the treatment facilities, leading to overestimation of influent loads. It should be noted that these five metals exhibited a large decrease in loading for 2018 versus previously reported annual data, due in large part to the new detection limits. Reported data from 2018 and 2019 are more directly comparable to each other, having been analyzed at the same method detection limits. TABLE 22 below shows the detection limit changes for cadmium, chromium, lead, nickel, and silver that went into effect in December 2017.

TABLE 22
NBC Detection Limit Changes in December 2017

Pollutant	Previous Detection Limit (ppb)	New Detection Limit (ppb)
Cadmium	2.5	0.02
Chromium	10.0	0.3
Lead	10.0	0.3
Nickel	10.0	0.3
Silver	4.0	0.02

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 and enterococci bacteria, CBOD, TSS, pH, and TRC. Effluent samples are also collected and analyzed for dissolved metals and oil and grease at both facilities on a monthly basis. Lastly, whole effluent bioassay toxicity tests are also conducted quarterly at both facilities.

Clean Sampling Methods

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, EM and TAC are constantly evaluating sample collection and handling procedures to ensure that contamination will not significantly affect the data results. Many years ago, EM began to use ultra-clean sampling methodology for mercury developed by Hampton Roads Sanitation District of Virginia. This methodology uses sample bottles, tubing, and pumps that allow sample collection and transfer without opening bottle tops, eliminating many potential sources of contamination. During 2020, EM plans to perform a study to evaluate expanding clean sampling to other pollutants of concern.

EM 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 treatment facilities. The program defines a strict protocol for cleaning the 10 and 15 liter HDPE composite carboys used in 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 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 waste stream sample into the composite carboy. 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 EM, in conjunction with the Laboratory, determine the steps needed to continue to improve sampling and laboratory procedures and instrumentation.

Field's Point Special Sampling Activities

The following summarizes the special sampling activities conducted at Field's Point during 2019:

- From August to October 2019, Field's Point had final effluent available cyanide concentrations above the daily maximum RIPDES permit limit of 10 µg/L. In an effort to locate the source of the cyanide, additional monitoring was conducted throughout the district and the plant. Samples were collected at industrial manholes downstream of SIUs with quantities of cyanide which could impact the plant. None of the samples collected in the manholes had high concentrations of cyanide. At the plant, samples were collected from the sodium bisulfite, polymer, sodium hypochlorite, gravity thickened sludge, gravity thickener supernatant, centrate, plant deodorizer, and a nearby rock salt storage supply. In addition, samples were collected from the manhole downstream of the Synagro building where the centrate discharges to assess if extra loads containing cyanide were being processed after weekends, and final effluent grab samples to determine any cyanide interferences caused by the sodium hydroxide preservative. Seventy out of 72 samples collected, starting November, did not have detectable total cyanide or detectable available cyanide results. On November 25, 2019, a preserved effluent grab sample had an available cyanide result of 4.42 µg/L, well below the permit limit. The only other sample with a detectable available cyanide result was a centrate sample collected on December 23, 2019 which had a result of 22.5 µg/L. However, the final effluent samples for December 24, 2019 and December 25, 2019 had available cyanide results below the detection limit.

As a result of the special study on cyanide, the cyanide sampling procedure was modified to specify pipetting of a specific volume of sodium hydroxide preservative.

Bucklin Point Special Sampling Activities

The following summarizes special sampling activities conducted at Bucklin Point during 2019:

- To better characterize the Return Activated Sludge (RAS), Bucklin Point initiated a second daily composite sample of the RAS begun in February 2018. This sample consists of three grab samples collected from the RAS piping by Operations staff. This new daily sample is an addition to the RAS composite samples collected by an automatic sampler. The RAS sampling has been continued during 2019.
- The Bucklin Point influent and effluent cyanide sampling procedure was modified to specify pipetting of a specific volume of sodium hydroxide preservative.

Analysis of Influent Loading Data

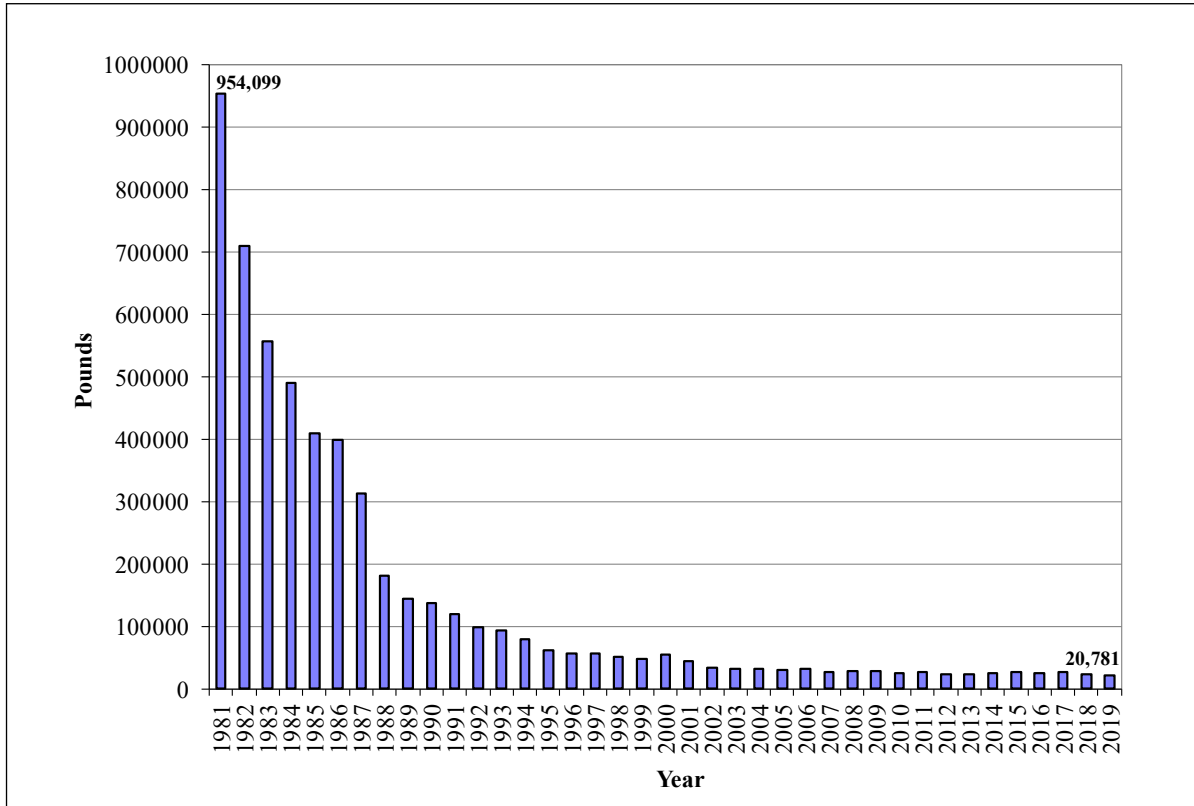
Comparing recent and historical influent loading data is useful for evaluating the success of the Pretreatment Program in controlling the quality of industrial wastewater discharged to the treatment plants. Analysis of historical toxic pollutant loadings to the two NBC wastewater treatment facilities 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 ownership and operation of the 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 38 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, chromium, copper, lead, mercury, nickel, silver, and zinc loadings. These loadings have shown a decrease of 97.8% since 1981. In fact, the total metals loadings to Field's Point have been below the annual 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 2019 decreased by 2,400.5 pounds, or 10.4% from 2018.

Cyanide loading data for the same time period indicates a similar overall downward trend, as can be seen in FIGURE 15, with a dramatic 98.7% decrease in loading between 1981 and 2019. Between 2018 and 2019 there was a 1,059.6 pound, or 50.0% decrease in cyanide influent loading into Field's Point. The long-term reduction in the metal and cyanide inputs to the treatment facility is largely due to the efforts and success of the Pretreatment and Technical Assistance programs.

FIGURE 15
Field's Point Cyanide Influent Loading Trend Analysis

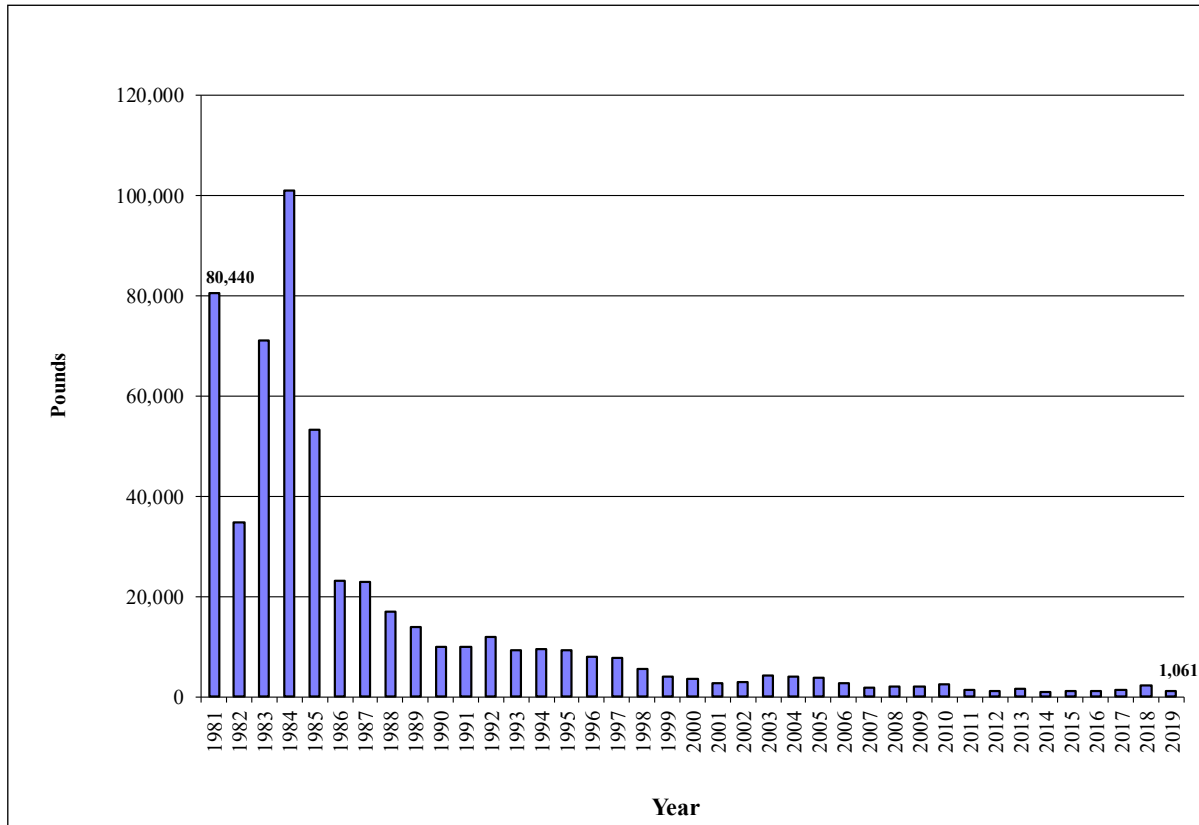


TABLE 23 provides a comparison of the 2018 and 2019 metals and cyanide loadings to Field's Point. Loading figures were calculated based on monthly total flow and average metals concentrations. As illustrated in TABLE 23, the annual influent loading for all metals showed a decrease of 10.4%, or 2,400.5 pounds in 2019 when compared to 2018. Of the eight metals used to calculate the total metals loadings, all metals, except for lead and mercury, showed a decrease. The largest percent decrease was seen in silver, which decreased by 16.7%. The largest percent increase was seen in mercury, which increased by 65.9%. Cyanide exhibited a decrease of 50.0%, or 1,059.6 pounds, from 2018 to 2019. Although lead and mercury loading levels increased over the past year, trend loadings over time show significant reductions over historic levels and present loadings are well below the annual MAHLs for these pollutants. Overall, the influent loading of metals remains low due to strict regulation by Pretreatment, 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 4.5 MG a day lower in 2019 than it was in 2018, with the average daily influent flow of 46.6 MGD in 2019 versus 51.1 MGD in 2018. There was also an average increase of 34,132 gallons per day in industrial flow to Field's Point in 2019.

TABLE 23
Comparison of 2018 – 2019 Annual Loadings to Field’s Point

Pollutant	2018 (Pounds)	2019 (Pounds)	Total Pound Change	% Change
Total Cadmium	33.9	31.6	-2.3	-6.8%
Total Chromium	697.5	601.9	-95.6	-13.7%
Total Copper	4,682.8	4,098.2	-584.6	-12.5%
Total Lead	1,100.4	1,174.2	73.8	6.7%
Total Mercury	2.11	3.50	1.39	65.9%
Total Nickel	3,270.3	2,983.8	-286.5	-8.8%
Total Silver	108.9	90.7	-18.2	-16.7%
Total Zinc	13,285.9	11,797.4	-1,488.5	-11.2%
Total Metals	23,181.8	20,781.3	-2,400.5	-10.4%
Total Cyanide	2,120.8	1,061.2	-1,059.6	-50.0%

In 2019, the Field’s Point facility provided secondary treatment to an additional 1.65 billion gallons of storm water and infiltration flow that was captured in the CSO Tunnel, approximately 474 million gallons less than in 2018. Metals results from the CSO effluent samples were flow-weighted, as concentrations can vary greatly depending upon the amount of flow that is being pumped from the tunnel. Please note, mercury sampling was added to CSO effluent sampling in April 2019. As can be seen in TABLE 24, sample results of the tunnel effluent in 2019 have shown that the metals in the tunnel effluent make up approximately 12.2% of the total plant influent metals loading, ranging from 3.4% to 45.3% of the total plant influent metals loading, depending upon the metal. Loading of lead from the tunnel comprised about 45.3% of the total influent lead load in 2019.

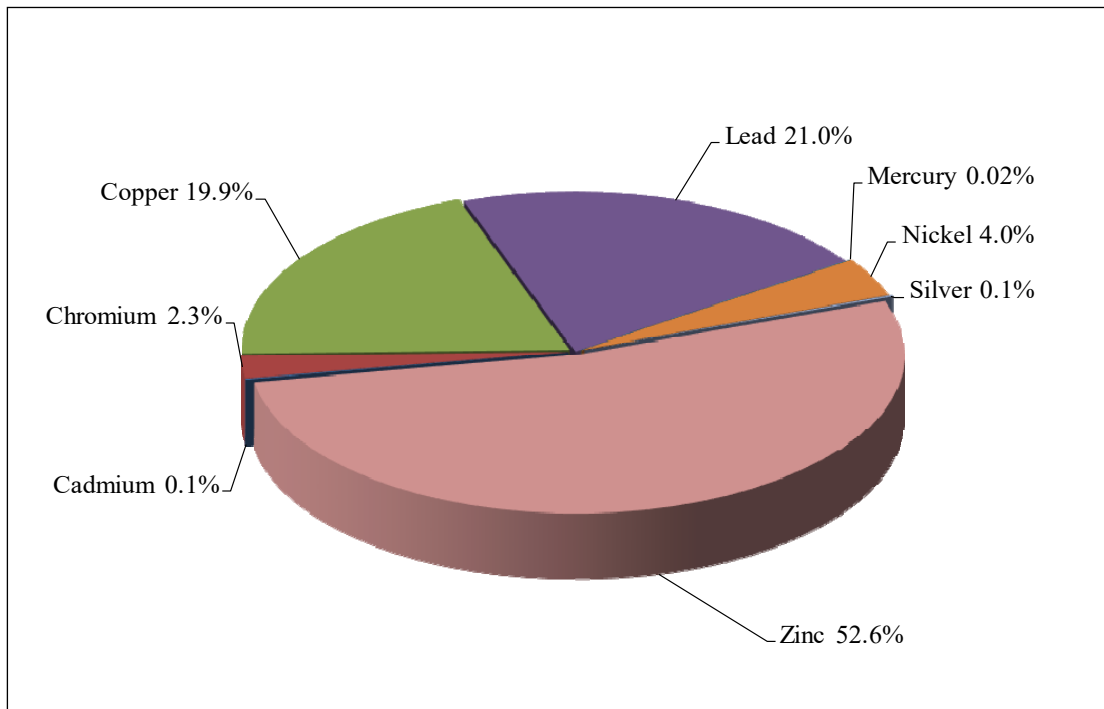
TABLE 24
Comparison of 2019 Annual Loading:
Tunnel Effluent Loadings to Field’s Point Influent Loadings

Pollutant	Annual Influent Loading (lbs) 2019	Annual Tunnel Effluent Loading (lbs) 2019	Percent of Influent
Cadmium	31.6	2.4	7.6%
Chromium	601.9	58.4	9.7%
Copper	4,098.2	505.3	12.3%
Lead	1,174.2	532.2	45.3%
Mercury*	3.50	0.57	16.3%
Nickel	2,983.8	100.7	3.4%
Silver	90.7	3.8	4.2%
Zinc	11,797.4	1,336.1	11.3%
Total	20,781.3	2,539.5	12.2%

*Mercury annual loading was calculated based on average flow-weighted concentration from April - December 2019 and total 2019 tunnel volume captured

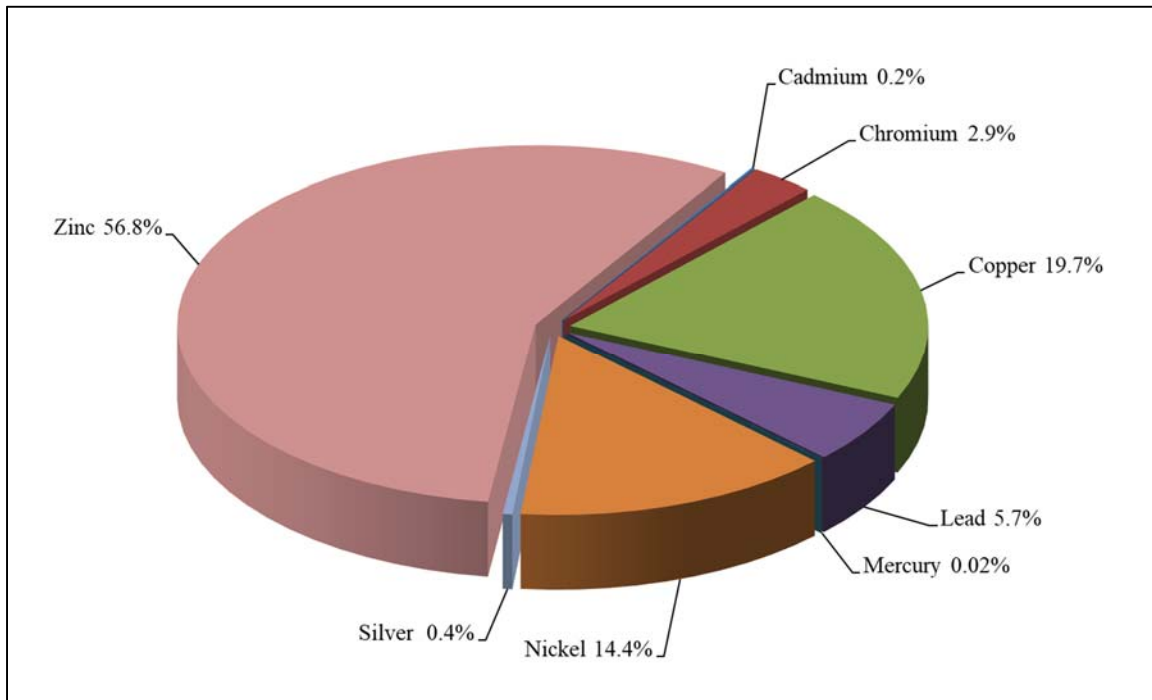
A percentage breakdown of the various metals discharged to Field’s Point via the CSO Tunnel is provided in FIGURE 16. As shown in FIGURE 16, the make-up of the CSO Tunnel effluent is similar to the typical influent with the notable exceptions of increased proportional lead contribution and decreased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

FIGURE 16
Breakdown of Total Metals – 2019 Loading from CSO Tunnel Effluent



A percentage breakdown of the various metals discharge 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 90.9% of the total metal loadings. The overall percent contribution of these three metals in 2019 is slightly less than percent contribution of these three metals in 2018, when these metals contributed 91.6% of total influent metals loadings. The total loading of zinc in 2019 was 11,797.4 pounds, or 56.8%, 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 4,098.2 pounds or 19.7% of the total loading, followed by nickel at 2,983.8 pounds or 14.4% of the total loading. The loadings levels of toxic pollutants to Field’s Point in 2019 were all well within the MAHL levels for each pollutant of concern, when expressed on an annual basis. This is a testament to the success of the NBC toxics reduction and control programs.

FIGURE 17
Breakdown of Total Metals – Field’s Point 2019 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 6.4 ppm to 42.9 ppm during 2019. 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 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 effluent grab samples are analyzed separately and the maximum and average results are reported on monthly discharge monitoring reports (DMR). The RIPDES permit does not set a discharge limit for oil and grease. The 2019 oil and grease data is listed in ATTACHMENT VOLUME II, SECTION 10.

Field's Point Influent and Effluent Organics

Volatile organic compounds (VOCs) were monitored monthly in the influent and effluent at the Field's Point facility in 2019. These samples were collected as composite and grab samples. The analysis of 36 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. Only 34 organic compounds were monitored prior to April 2019, at which time acrolein and acrylonitrile were added to the routine monitoring. 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 426 analytical results for influent samples obtained in 2019, 92.3% of these were at non-detectable concentration levels. Of the 425 analytical results for effluent samples obtained in 2019, 94.6% of the results were at non-detectable concentration levels. The low levels of VOCs observed demonstrates the effectiveness of the Pretreatment efforts to reduce the amount of organic pollutants introduced to the NBC facilities, dramatically reducing the potential for adverse impacts on NBC receiving waters.

Field's Point Influent and Effluent Nitrogen

In the RIPDES permit, Field's Point must meet seasonal May through October monthly average permit limits for total nitrogen of 5.0 mg/L for total nitrogen concentration and 2,711 pounds per day for total nitrogen loading. Biological Nutrient Removal (BNR) processes ran extremely well in 2019 and monthly average permit limits were met during each month of the permit season. The May through October total effluent nitrogen concentration average was 2.7 mg/L with an average loading of 1,005.0 pounds/day. Field's Point had an average daily flow to the facility of 41.2 MGD in the May through October season, with an influent total nitrogen concentration average of 26.8 mg/L for May through October, resulting in an 89.9% removal rate of total nitrogen.

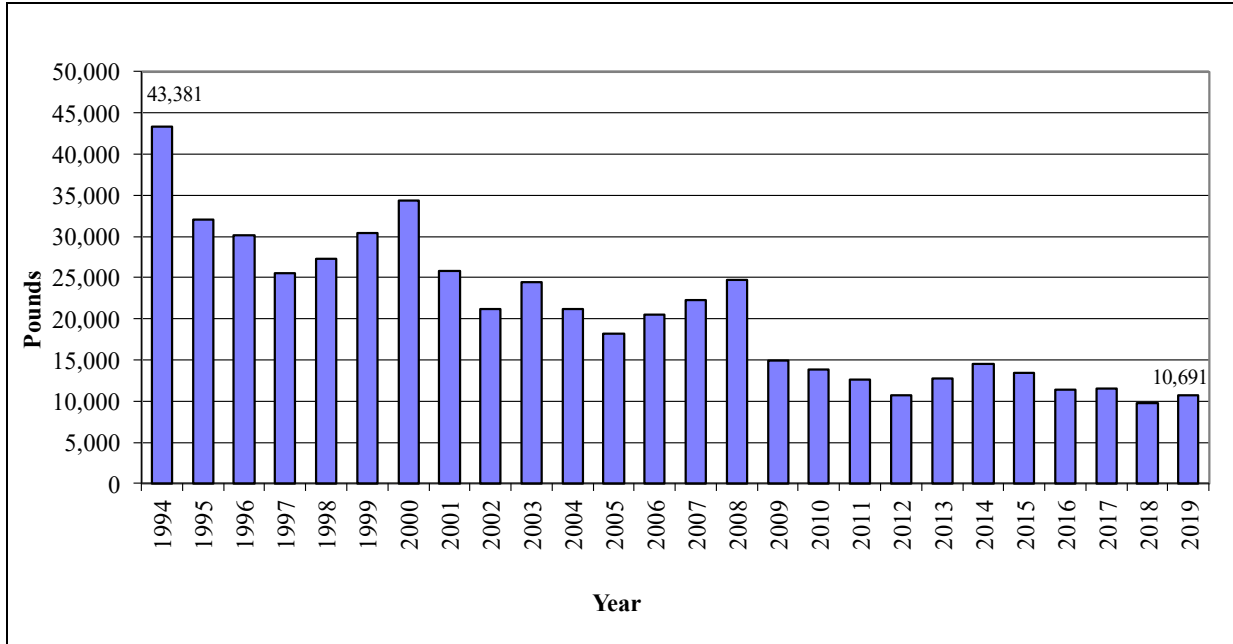
pH Variability at Field's Point: Influent and Effluent

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 EM and immediately transferred to the lab for analysis. EM collected 365 influent pH samples during 2019. The pH range of the influent sample measurements was between 6.30 and 7.29 standard units (s.u.). The influent waste stream 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 2019 and no negative effect on normal plant operation process controls was noted. Effluent grab samples were collected once per day, resulting in 365 samples collected in 2019. Over the year, the effluent pH ranged from 6.23 to 7.18 s.u. There were no effluent pH permit violations during 2019.

Bucklin Point District – Influent Loading Analysis

FIGURES 18 and 19 depict the overall reduction in metals and cyanide loadings to Bucklin Point between 1994 and 2019. In 2019, influent metals loading increased by 9.74% or 948.6 pounds as compared to 2018. The 2019 total metals loading to Bucklin Point was well below the annual 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 86.0%. In 2019, influent cyanide loading decreased by 18.1% or 90.1 pounds as compared to 2018. Loadings remain well below the MAHL level established to protect the treatment facility and the environment.

FIGURE 19
Bucklin Point Cyanide Influent Loading Trend

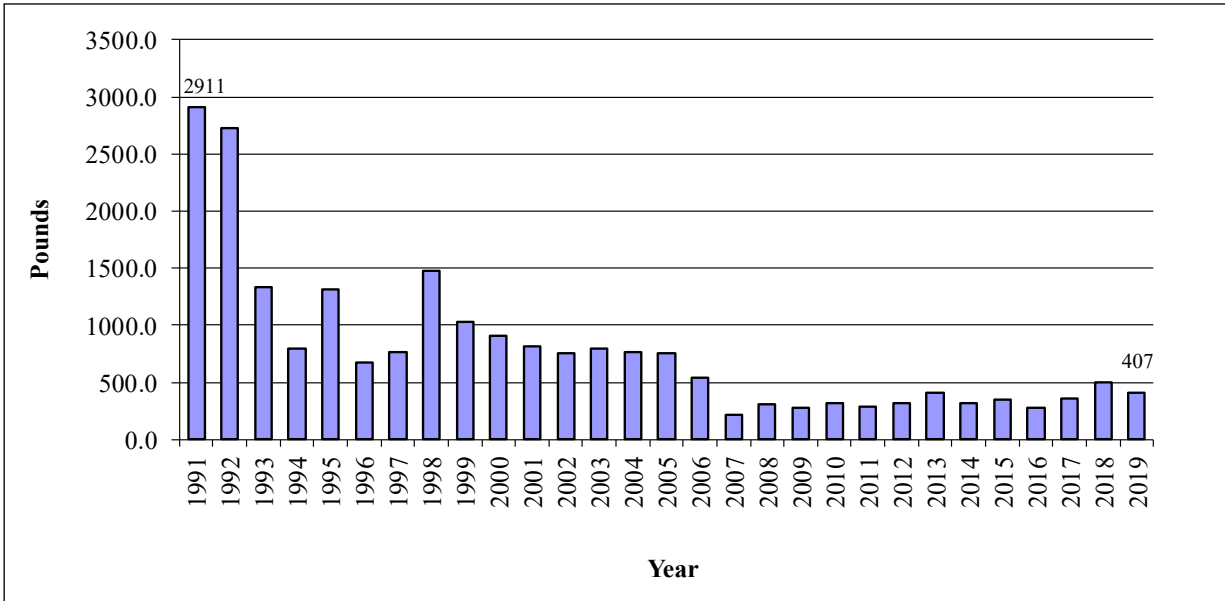


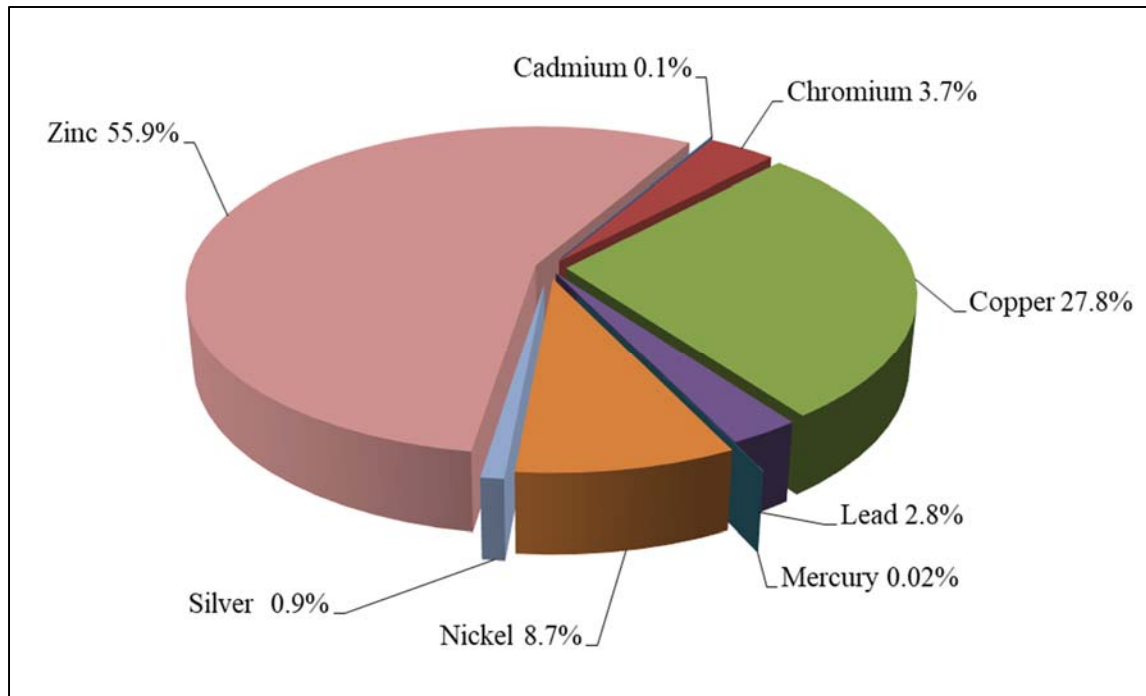
TABLE 25 compares individual Bucklin Point metals and cyanide loadings from 2019 to the previous year. This year, nearly all influent metals showed an increase in loading, except for cadmium and chromium. Cadmium decreased by 9.9 %, or 1.2 pounds, while chromium decreased by 0.2 %, or 0.8 pounds. The largest percent increase of the metals was seen in mercury, which increased by 70.1 %, or 0.94 pounds. The smallest percent decrease was seen in lead, with an increase of 1.6%, or 4.9 pounds. In spite of an overall increase in metals loadings in 2019, total metals loading to Bucklin Point have decreased by 75.4% between 1994 and 2019.

TABLE 25
Comparison of 2018 – 2019 Annual Loadings to Bucklin Point

Pollutant	2018 Pounds	2019 Pounds	Total Pound Change	% Change
Total Cadmium	12.1	10.9	-1.2	-9.9%
Total Chromium	393.0	392.2	-0.8	-0.2%
Total Copper	2,645.5	2,976.6	331.1	12.5%
Total Lead	297.8	302.7	4.9	1.6%
Total Mercury	1.34	2.28	0.94	70.1%
Total Nickel	718.1	931.0	212.9	29.6%
Total Silver	76.0	98.8	22.8	30.0%
Total Zinc	5,599.1	5,977.1	378.0	6.8%
Total Metals	9,743.0	10,691.6	948.6	9.7%
Total Cyanide	497.7	407.6	-90.1	-18.1%

FIGURE 20 provides a breakdown of the relative contribution of individual metals to the total influent loadings to Bucklin Point. As in previous years, zinc and copper were the largest contributors, accounting for 83.7% of the total. Total zinc loadings increased by 378.0 pounds or 6.8% compared to 2018. Similarly, copper increased by 331.1 pounds or 12.5% compared to 2018. Other metals contributing substantial loadings included chromium, nickel, and lead, accounting for another 15.2% of the total.

FIGURE 20
Breakdown of Total Metals – Bucklin Point 2019 Influent Loadings

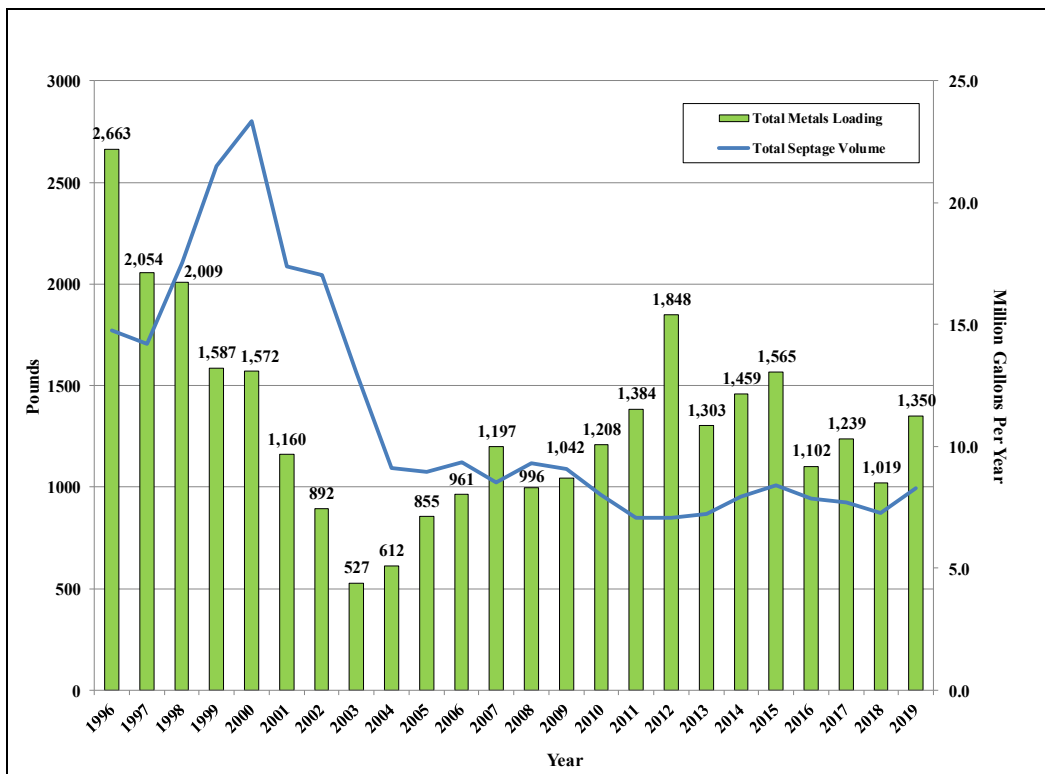


Septage Loading to Bucklin Point Influent

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 waste stream entering the collection system for transport to the Bucklin Point plant for processing. A sample from each load is collected after the sample port on the truck is flushed thoroughly, usually after the load has discharged for approximately one minute. The sample from each individual truck is screened for pH, odor, and any unusual characteristics. If an 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 the septage between 1996 and 2019. The NBC received 8.28 million gallons of septage in 2019, representing an increase of 13.8% compared to 2018. When compared to 1996 there has been an overall decrease of 43.9% in septage flow. The graph shows septage volume peaked in 2000 at approximately 23 million gallons. As the economy took a downturn in the early 2000s, septic tank pump out frequency declined. This allowed solids, and the metals contained in the solids, to build up in septic tanks and the loads increased proportionally at our facility when the tanks were purged. From 2018 to 2019 there was a 32.5% increase in total metals loading from septage, or 331.1 pounds. In spite of the increase in 2019, overall total metals from septage has decreased by 49.3% since 1996.

FIGURE 21
Trend Analysis for Total Metals Loadings in Septage

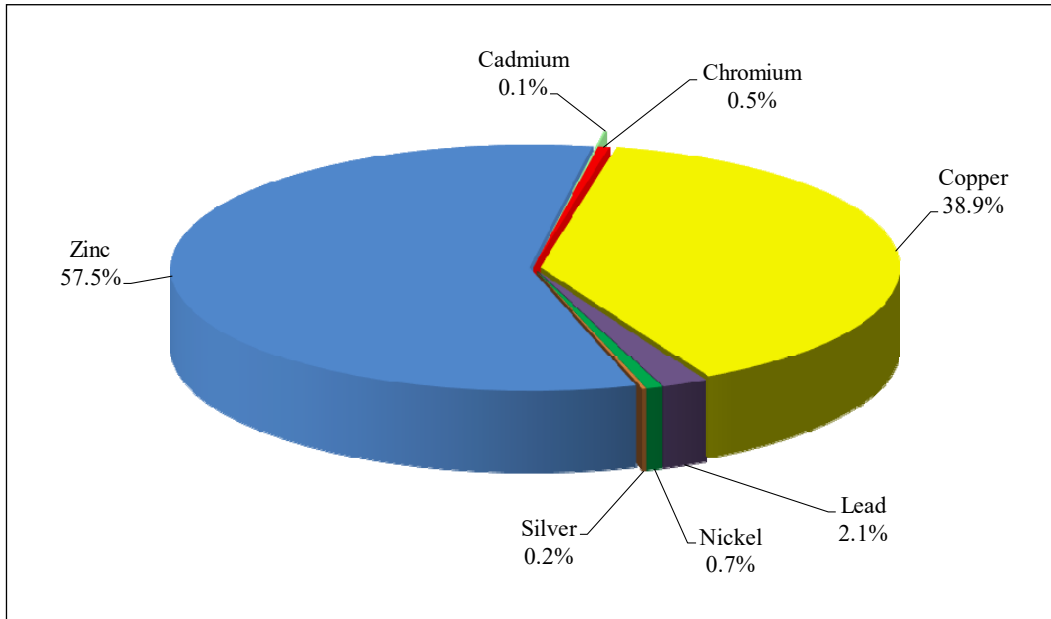


Despite the small overall flow of septage to Bucklin Point, the metals loading from septage is substantial. The septage contribution to total influent metals loading at Bucklin Point was 12.6% in 2019, an increase of the contribution of 10.5% in 2018.

FIGURE 22 illustrates the average relative composition of metals in the septage received at the NBC facility in 2019. As in previous years, zinc and copper continue to make up the majority of metals loadings, 96.4%, within the septage, at 525 pounds of copper and 776.4 pounds of zinc in 2019. Zinc loading represented 13.0% of the total influent zinc

loading to Bucklin Point during 2019. Copper from septage amounted to 17.6% of the total copper influent load. The substantial loadings for these metals from residential-quality septage underscores the significance of uncontrolled sources of influent metals loadings to NBC facilities. The septage monitoring data generated during 2019 are provided in ATTACHMENT VOLUME II, SECTION 10.

FIGURE 22
2019 Breakdown of Total Metals in Septage



Oil and Grease Inputs to Bucklin Point

Monthly monitoring of oil and grease inputs to Bucklin Point revealed consistently low concentrations. During 2019, average influent concentrations ranged from 9.59 ppm to 29.6 ppm. Effluent concentrations were substantially 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 facilities, 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 effluent grab samples are analyzed separately and the maximum and average results are reported on monthly DMRs. The RIPDES permit does not set a discharge limit for oil and grease. The 2019 monthly average 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 2019. The analysis of 36 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. Only 34 organic compounds were monitored prior to April 2019, at which time acrolein and acrylonitrile were added to the routine monitoring. 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 426 analytical results for influent samples obtained in 2019, 91.5% of these were at non-detectable concentration levels. Of the 426 analytical results for effluent samples obtained in 2019, 98.6% 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 (BNR) upgrades were completed at Bucklin Point in order to meet a new seasonal (i.e., May through October) total nitrogen concentration permit limit of 5.0 mg/L and loading limit of 1,293 pounds/day. These permit limits went into effect on July 14, 2014.

The 2019 May through October BNR season was successful, and monthly average permit limits were met all season. Overall, the plant achieved a seasonal removal rate of 90.8% of the total nitrogen entering the plant in the influent. Over the 2019 permit season, daily flow to the facility averaged 19.64 MGD and influent nitrogen concentration averaged 35.67 mg/L. Effluent total nitrogen concentrations averaged 3.28 mg/L, with loadings averaging 522.4 pounds/day.

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, EM 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 2019, EM staff collected 35 samples in residential sanitary and combined sewers (14 in Bucklin Point district; 21 in Field’s Point district). Samples were collected as 24-hour composites in wet and dry weather conditions. TABLE 24 summarizes the results for the background sample collections for 2019 and compares them to influent concentrations and loading estimates at the NBC facilities. 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 pooled to determine the average background concentrations. Loadings were calculated using the average background concentrations and average daily non-industrial flow rates to each facility. Note that permitted industrial and commercial sources account for only 3.9% of total flow into Bucklin Point and 3.0% of the total flow at Field’s Point. Estimated combined stormwater volume captured by the CSO tunnel in the Field’s Point district (3.4 MGD, 7.4% of total influent volume) was also excluded from the flows used to calculate background loading estimates.

TABLE 26
Results from 2019 Background Metals and Cyanide Contribution Study

Concentration (ppb)												
	Cd	Cr	Cu	Pb	Hg	Ni	Ag	Zn	CN, Total	As	Se	Mo
Background	0.12	1.07	17.17	3.27	0.01	2.59	0.09	68.95	4.23*	0.59*	1.05*	0.73
FP Influent	0.22	4.26	29.48	8.64	0.03	20.92	0.64	85.37	7.18	2.55	1.77	6.47
% of Influent at FP	54.5%	25.1%	58.2%	37.8%	33.3%	12.4%	14.1%	80.8%	59.0%*	23.1%*	59.3%*	11.3%
BP Influent	0.16	5.55	45.27	4.53	0.04	13.94	1.46	89.95	5.69*	0.82	1.00*	3.86
% of Influent at BP	75.0%	19.3%	37.9%	72.2%	25.0%	18.6%	6.2%	76.7%	74.4%*	72.0%*	105.0%*	18.9%
Loading (lbs/year)												
	Cd	Cr	Cu	Pb	Hg	Ni	Ag	Zn	CN, Total	As	Se	Mo
Background (FP District)	14.96	135.76	2183.20	415.53	1.28	329.16	11.93	8765.91	538.39*	74.84*	133.74*	92.85
FP Influent	31.58	601.90	4098.17	1174.15	3.50	2983.80	90.71	11797.42	1061.25	364.63	253.48	892.19
% of Influent at FP	47.4%	22.6%	53.3%	35.4%	36.6%	11.0%	13.2%	74.3%	50.7%*	20.5%*	52.8%*	10.4%
Background (BP District)	7.86	71.33	1147.12	218.34	0.67	172.95	6.27	4605.89	282.89*	39.32*	70.27*	48.79
BP Influent	10.85	392.23	2976.59	302.74	2.28	930.97	98.84	5977.10	407.58*	56.09	69.49*	253.93
% of Influent at BP	72.4%	18.2%	38.5%	72.1%	29.4%	18.6%	6.3%	77.1%	69.4%*	70.1%*	101.1%*	19.2%

*These pollutants had at least 25% of samples below detection limit; Cd, Cr, Pb, and Ag were regularly measured at or below the detection limit until a change in methods in December 2017.

The 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 26 should be noted. First, detection limit values were entered for samples with concentrations below the laboratory detection limits. This may lead to over estimation of true concentrations and loadings from a particular source. Metals for which such censorship reached 25% or more are indicated in TABLE 26 to draw attention to the problematic nature of the estimates. Second, results of background samples taken from both districts were used to determine the annual average background concentrations; note that in 2019, a higher proportion of samples were collected in the Field's Point district, resulting in greater influence of these data on the overall average. 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 pollutants coming from uncontrolled sources.

From TABLE 26 it is evident that a major portion of the influent cadmium, copper, lead, mercury, selenium, and zinc loadings observed at both facilities are from background sources; arsenic at Bucklin Point also appears to come largely from background sources. These background sources may include discharges from domestic users, street runoff, leaching from residential plumbing piping, and contaminated soils. In particular, it is apparent that most zinc (the trace metal with the highest concentration at the treatment plants and septage loads) is coming from non-industrial sources, as over 70% of the loading and concentrations from each plant can be accounted for in the background sampling.

TABLE 27 below shows the geometric mean concentrations of all background metals and cyanide samples collected since 2002 in both NBC drainage areas. The highest total metals concentration occurred in 2007, while 2019 saw the lowest total metals concentrations since 2002. Many factors may contribute to year-to-year variability, including the specific manhole sites sampled each year. Note that sanitary manhole background monitoring for tin was discontinued in July 2018.

TABLE 27
Historical Background Metals and Cyanide Results 2002-2019 (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
2017	0.18	1.93	34.75	7.61	0.03	3.36	0.21	135.55	4.72	0.74	1.09	5.00	1.01	183.62
2018	0.18	1.21	28.39	6.35	0.02	2.46	0.17	99.16	4.91	0.58	1.03	5.00	0.83	137.94
2019	0.12	1.07	17.17	3.27	0.01	2.59	0.09	68.95	4.23	0.59	1.05		0.73	93.27

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

From this analysis, it is apparent that large percentages of the toxic 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. NBC 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

Consistent monitoring of the various sources and concentrations of toxics entering the NBC plants has documented dramatic decreases in these loads, largely due to the efforts of Pretreatment and TAC sections. To achieve these decreases, Pretreatment enforces the categorical standards set by the EPA to achieve a nationally uniform system of water pollution control for selected industries and pollutants as well as local limits defined for each POTW. Local limits are intended to protect the wastewater treatment facility, the receiving waters, sludge quality, and the health of the public, as well as to prevent environmental problems as a result of discharges from any non-domestic user.

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. Local limits evaluation includes calculation of the MAHL, which represents the loadings of a particular pollutant 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. The MAHL must also protect sludge quality, to allow for the safe disposal of solids removed from the wastewater.

TABLE 28 provides a comparison of the NBC MAHL goals with the total metal influent loadings for 2019. During local limits evaluation, MAHLs are calculated to estimate the maximum allowable daily loadings. However, TABLE 28 extrapolates these to maximum allowable pounds per year for comparison to total annual influent pollutant loads. In the case of cyanide, MAHL goals for both plants were calculated using the EPA 20 ppb quantitation-based effluent permit limit in place at the time of MAHL calculation. For Bucklin Point, copper MAHL goals were calculated using the RIPDES effluent permit limits in the Consent Agreement in effect at the time of calculation. In all cases, annual average influent loads in 2019 remained well within the MAHLs as expressed as an annual allowable load. The low annual influent loads of these metals attest to the overall effectiveness of NBC Pretreatment and TAC initiatives and measures to control pollutant sources to the POTWs. Local limits and MAHL goals for each plant are currently under review based upon the requirements of the current RIPDES permits, which became effective December 1, 2017.

TABLE 28
Comparison of 2019 Influent Loadings to
Maximum Allowable Headworks Loadings (MAHL)

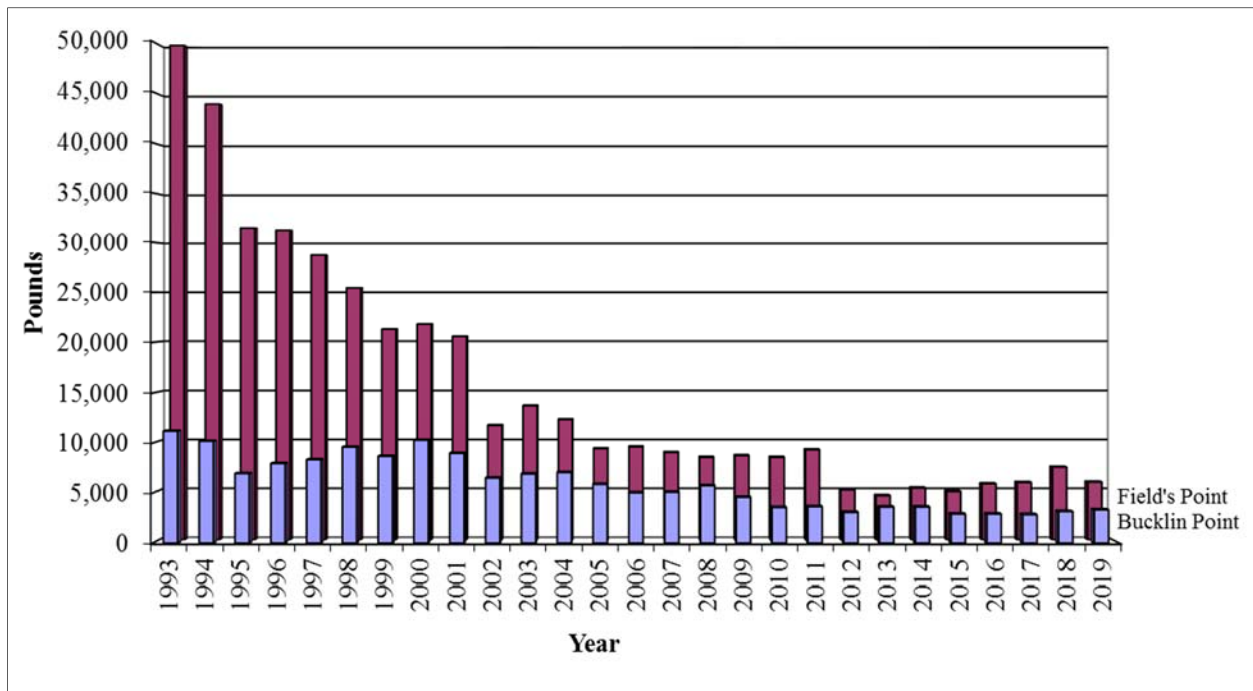
Parameter	Field's Point			Bucklin Point		
	MAHL lbs/yr	2019 Loading lbs/yr	Below MAHL?	MAHL lbs/yr	2019 Loading lbs/yr	Below MAHL?
Cadmium	2,227	31.6	Yes	511	10.9	Yes
Chromium	37,303	601.9	Yes	10,439	392.2	Yes
Copper	16,900	4,098.2	Yes	4,015	2,976.6	Yes
Lead	8,541	1,174.2	Yes	2,738	302.7	Yes
Mercury	183	3.50	Yes	11	2.3	Yes
Nickel	21,134	2,983.8	Yes	1,314	931.0	Yes
Silver	3,942	90.7	Yes	402	98.8	Yes
Zinc	50,005	11,797.4	Yes	16,498	5,977.1	Yes
Total Metals	140,235	20,781.3	Yes	35,928	10,691.6	Yes
Cyanide	4,453	1,061.2	Yes	2,446	407.6	Yes

Analysis of Effluent Loading Data

This chapter attempts to quantitatively measure the results of the work of Pretreatment and TAC sections by analyzing the loadings of toxics in the influent of the NBC facilities. However, meeting MAHL goals based on annual average influent loadings as noted above does not necessarily translate to compliance with RIPDES daily or monthly discharge limits for the effluent. It is also important to consider the compliance and potential environmental impacts of effluent 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 2019 were compiled and analyzed. The overall effluent trends are similar to those for the influent data, as concentrations and loadings have generally been decreasing over time at Field's Point and Bucklin Point.

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 2019, total metals in the Field's Point effluent amounted to 5,823.1 pounds, a decrease of 20.6%, or 1,514.1 pounds, compared to the 2018 total load of 7,337.2 pounds. Overall, since 2011, effluent metals loadings have been reduced by 36.0% at Field's Point. This dramatic decrease is partially attributable to BNR treatment technologies that began to come into operation at that plant in 2012. The total metals load in the 2019 Bucklin Point effluent was 3,330.8 pounds, an increase of 5.4%, or 169.9 pounds, compared to the 2018 load of 3,160.9 pounds. 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 in 2014, and effluent metals have remained lower since. Overall, since 1993, effluent metals from Bucklin Point have decreased by 70.2% and effluent metals at Field's Point have decreased by 88.3%.

FIGURE 23
NBC Total Metals Effluent Loadings Trend Analysis



As shown in FIGURE 24, effluent cyanide loadings decreased by 29.4% at Field’s Point and 22.9% at Bucklin Point from 2018 to 2019. Note that while this chapter presents the annual loadings of total cyanide, the NBC reports only available cyanide on DMRs submitted monthly to DEM. At Field’s Point, available cyanide represented 67% of total cyanide, or 615.0 pounds, compared to total cyanide loading of 923.7 pounds. At Bucklin Point, available cyanide represented 76% of the cyanide load in 2019, or 265.6 pounds, compared to the total cyanide annual loadings of 348.4 pounds. Note that at both plants, effluent available cyanide results were frequently measured below detection limits and reported using detection-limit-substitution for the purposes of loading calculations. Therefore, the percentage of total cyanide that is available is likely overestimated in these calculations.

FIGURE 24
NBC Cyanide Effluent Loadings Trend Analysis

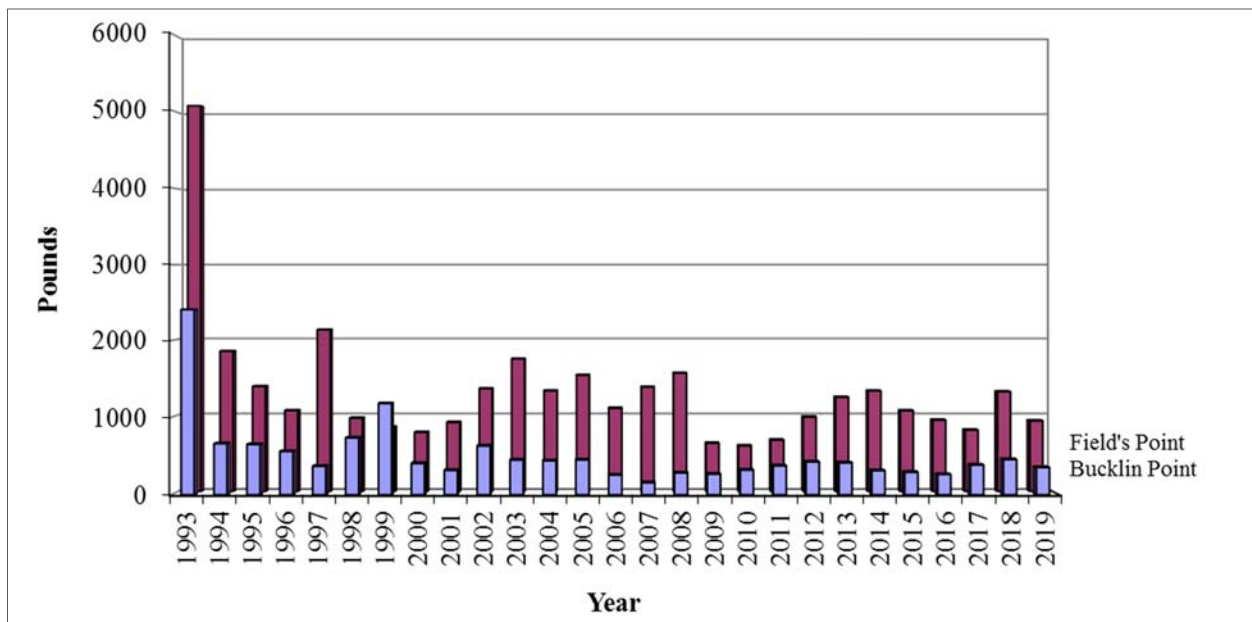


TABLE 29 provides a comparison of the 2018 and 2019 metals and cyanide effluent loadings from Field’s Point. Loading figures were calculated based on monthly averages of concentration and total monthly flow. The annual effluent loading for all metals showed a decrease of 20.6%, or 1,513.9 pounds, in 2019 when compared to 2018. All metals exhibited decreases in effluent loading in 2019, with the greatest relative percent decrease, 30.6%, observed in cadmium. Overall, effluent metal loadings remain low due to strict regulation by Pretreatment, the NBC pollution prevention educational efforts, and NBC wastewater treatment technology. Effluent flow from Field’s Point was on average 4.1 MG a day lower in 2019 than it was in 2018, with the average daily effluent flow of 46.5 MGD in 2019 versus 50.6 MGD in 2018.

TABLE 29
Comparison of 2018 - 2019 Annual Loadings from Field's Point

Pollutant	2018 Pounds	2019 Pounds	Total Pound Change	% Change
Total Cadmium	4.9	3.4	-1.5	-30.6%
Total Chromium	156.9	144.2	-12.7	-8.1%
Total Copper	434.4	316.8	-117.6	-27.1%
Total Lead	62.3	52.8	-9.5	-15.2%
Total Mercury	0.34	0.33	-0.01	-2.9%
Total Nickel	2,370.3	1,938.8	-431.5	-18.2%
Total Silver	4.7	3.9	-0.8	-17.0%
Total Zinc	4,303.2	3,362.9	-940.3	-21.9%
Total Metals	7,337.2	5,823.1	-1,514.1	-20.6%
Total Cyanide	1,307.8	923.7	-384.1	-29.4%

TABLE 30 compares individual Bucklin Point metals and cyanide effluent loadings from 2019 to the previous year. Overall, total metals loading from the Bucklin Point facility increased 5.4%, or 169.9 pounds, from 2018 to 2019. Of the eight metals used to calculate total metal loadings, only chromium and lead showed a decrease in loadings from 2018. Chromium effluent loadings showed a decrease of 6.1%, or 2.8 pounds, while lead decreased by 2.3%, or 0.8 pounds. The metal with the largest percent increase was nickel, which increased by 36.2%, or 122 pounds. Cadmium saw no change in effluent loadings when compared to 2018. Effluent flow from Bucklin Point was on average 0.1 MG a day lower in 2019 than it was in 2018, with the average daily effluent flow of 21.8 MGD in 2019 versus 21.9 MGD in 2018.

TABLE 30
Comparison of 2018 - 2019 Annual Loadings from Bucklin Point

Pollutant	2018 Pounds	2019 Pounds	Total Pound Change	% Change
Total Cadmium	2.6	2.6	0.0	0.0%
Total Chromium	46.2	43.4	-2.8	-6.1%
Total Copper	324.6	326.6	2.0	0.6%
Total Lead	35.5	34.7	-0.8	-2.3%
Total Mercury	0.20	0.19	0.01	0.05%
Total Nickel	337.1	459.1	122.0	36.2%
Total Silver	3.9	3.8	-0.1	-2.6%
Total Zinc	2410.8	2460.4	49.6	2.1%
Total Metals	3160.9	3330.8	169.9	5.4%
Total Cyanide	451.7	348.4	-103.3	-22.9%

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. These figures show that zinc, nickel, and copper are the largest components of the effluent total metals load at both Field's Point and Bucklin Point. In 2019, these three metals accounted for 96.5% of the total metals effluent loading from Field's Point and 97.5% of total metals effluent loading for Bucklin Point. At Field's Point, nickel represents a higher percentage of the total metals in the effluent than in the influent, nickel comprised 33.3% of the effluent loading totals versus only 14.4% of the influent. At Bucklin Point, nickel and zinc represent higher percentages of the total metals in the effluent than in the influent due to their low removal efficiency compared to the other metals. For example, at Bucklin Point, zinc represented 73.9% of the effluent loading total versus only 55.9% of the influent.

FIGURE 25
Breakdown of Total Metals - Field's Point 2019 Effluent Loading

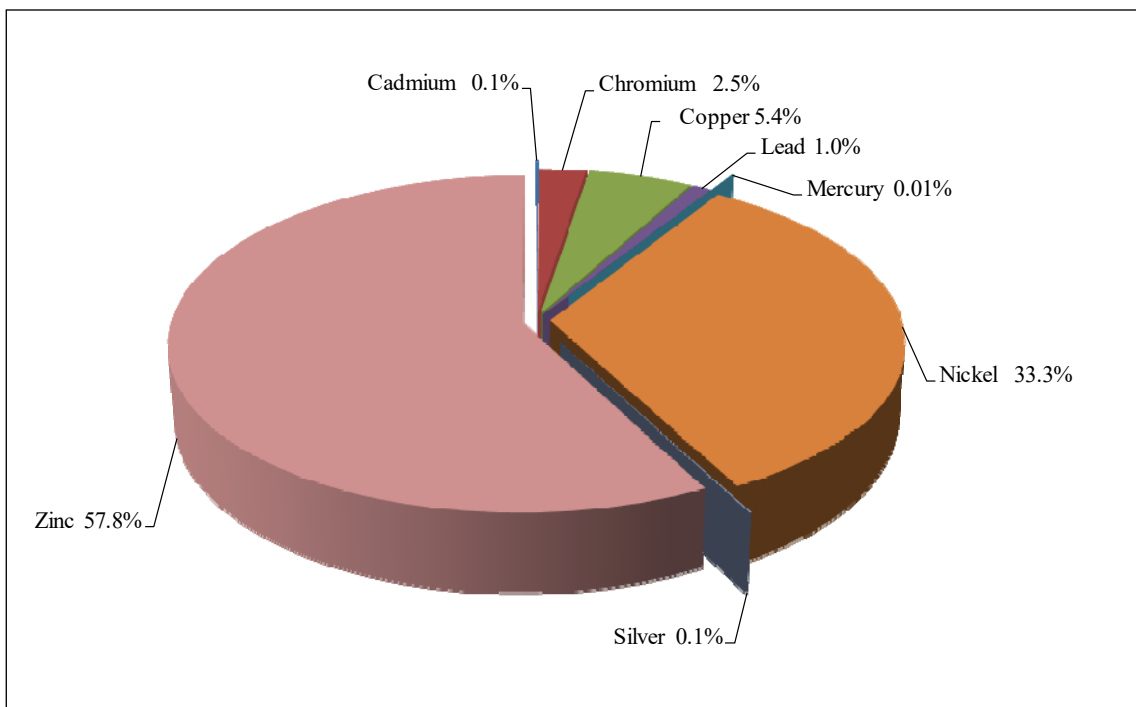
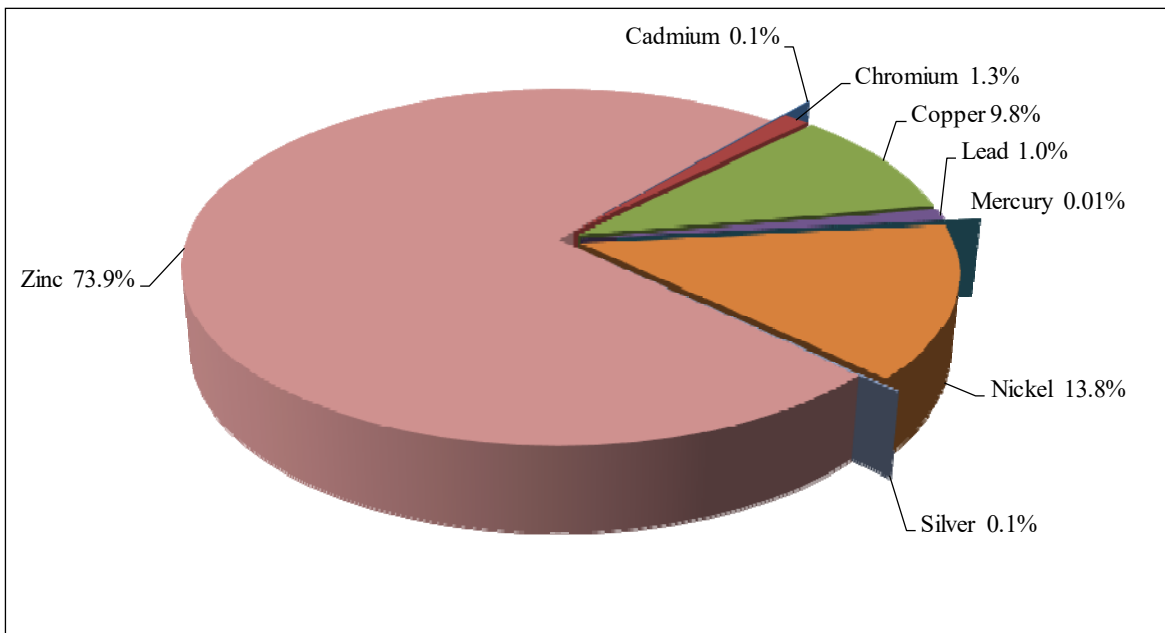


FIGURE 26
Breakdown of Total Metals - Bucklin Point 2019 Effluent Loading



Bioassay Data

The two NBC facilities are required to conduct quarterly bioassay studies to determine effluent toxicity to various test organisms. Test organisms are exposed to wastewater effluent at multiple dilutions to evaluate whether such exposure leads to reduced survival or reproductive success. 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 2019 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 LC₅₀ and the A-NOEC statistics. The LC₅₀ 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 LC₅₀ 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 LC₅₀ and A-NOEC indicating not observable effect of undiluted effluent on the study organisms.

In the chronic tests, the C-NOEC was 50% for Quarter 1 and Quarter 3 and was 100% for Quarter 2 and Quarter 4 at Field's Point. At Bucklin Point, the C-NOEC was 50% for Quarter 3 and 100% for Quarter 1, Quarter 2, and Quarter 4. Results of the quarterly bioassay tests for 2019 are included in ATTACHMENT VOLUME II, SECTION 10.

Bucklin Point Final Effluent pH Variability and Permit Compliance

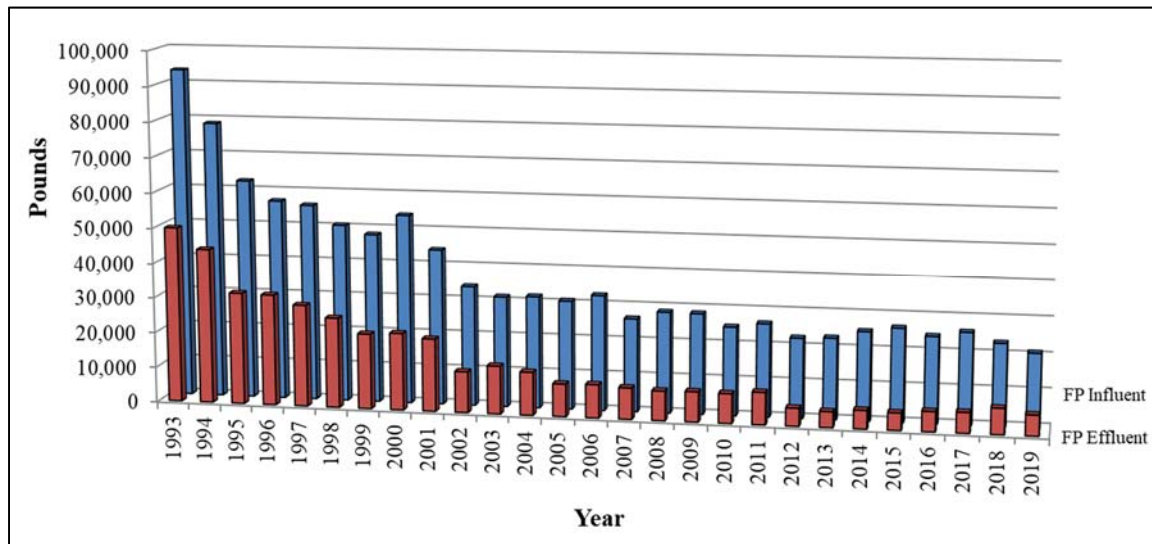
The pH of the Bucklin Point effluent is measured daily by EM staff with the use of a high-precision Orion pH meter. This analytical program is under the supervision of the NBC Laboratory. The addition of soda ash (sodium bicarbonate) to the process at Bucklin Point enables more effective biological nutrient reduction and typically maintains the effluent pH within the desired permit range. The values measured in 2019 ranged between 6.03 and 6.97 s.u.

The lack of pH permit violations over the course of 2019 reflects the success of the 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 ranged from 34.7% to 95.7% in 2019. Influent loading decreased by 10.4%, or 2,400.5 pounds in 2019 as compared to 2018. Effluent loadings decreased by 1,514.1 pounds or 20.6% in 2019. Since the plant upgrades associated with the nitrogen removal process went into operation, removal efficiencies for metals have increased substantially.

FIGURE 28 provides a comparison between the historical influent and effluent total metal loadings for Bucklin Point. As noted for Field's Point, a major portion of each pollutant observed in the plant influent is removed in grit and sludge during the treatment process. In 2019 there was a 948.6 pound or 9.7% increase in influent metals. Effluent metals increased by 170 pounds or 5.4% over 2018 loadings. Percent removal of the various metals at Bucklin Point ranged from 58.1% to 95.9%.

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

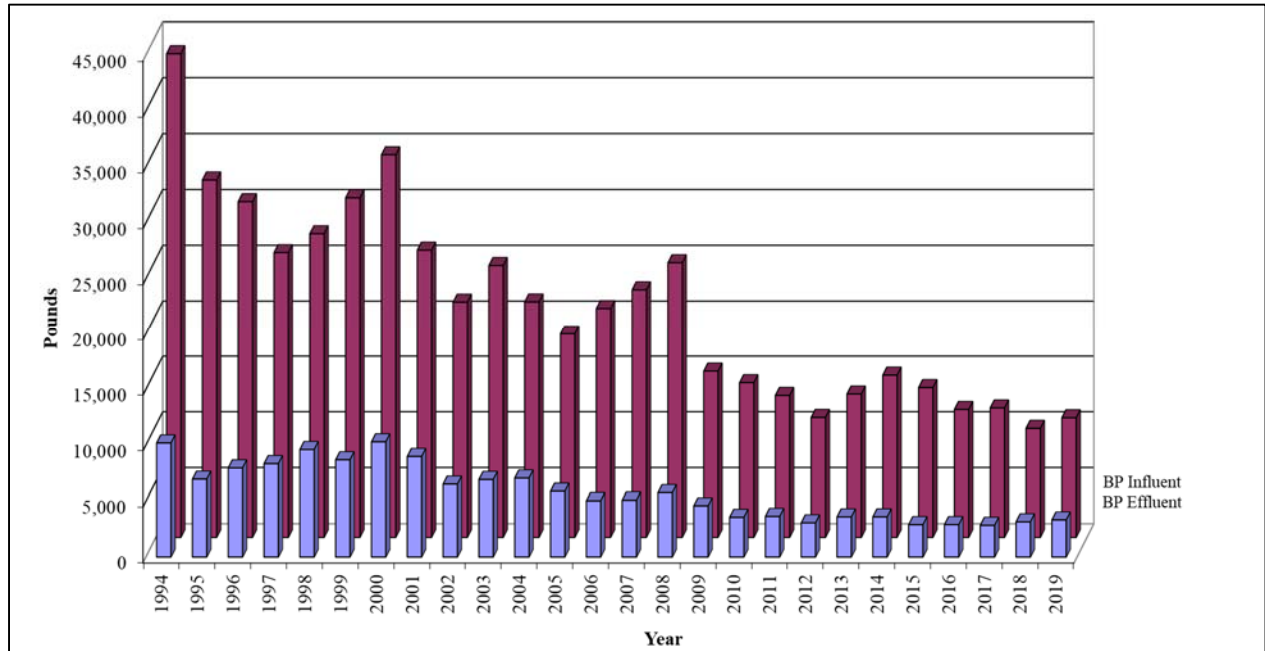


TABLE 31 details removal rates for each of the heavy metals and total cyanide at both NBC wastewater treatment plants. The term removal here means the reduction of pollutants in the wastewater through their incorporation into settleable solids, which are then concentrated into sludge material. Municipal wastewater treatment plants are not designed to treat and remove industrial waste such as heavy metals beyond such passive settling. Those metals that occur primarily in the dissolved phase (e.g., nickel) will be discharged to the receiving waters with less removal than those that are more particle-reactive (e.g., copper or lead) which settle more readily 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 TABLE 31 were measured as below detection in 25% or more of samples in 2019. All results censored by detection limits were statistically analyzed at their detection limits, resulting in overestimation of these concentrations.

From TABLE 31 it is easy to see that a major portion of all toxic pollutants are removed from the waste stream at the NBC plants prior to effluent discharge to the receiving waters of Narragansett Bay. The Field’s Point facility was able to remove 90% or more of the cadmium, copper, lead, mercury, and silver discharged in the district. The Bucklin Point facility was able to remove approximately 88% or more of the chromium, copper, lead, mercury, and silver discharged to the plant. Nickel had the lowest percent removal rate of the heavy metals at both plants, with 34.7% removal at Field’s Point and 48.3% removal at Bucklin Point.

TABLE 31
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	0.22	0.02*	90.9%	0.16	0.04	75.0%
Chromium	4.26	1.02	76.1%	5.55	0.67	87.9%
Hexavalent Chromium	22.67	10.00*	55.9%	27.92	10.00*	64.2%
Copper	29.48	2.19	92.6%	45.27	4.97	89.0%
Lead	8.64	0.37*	95.7%	4.53	0.53	88.3%
Mercury	0.0254	0.0023	90.9%	0.0373	0.0027	92.8%
Nickel	20.92	13.67	34.7%	13.94	7.21	48.3%
Silver	0.64	0.03*	95.3%	1.46	0.06	95.9%
Zinc	85.37	23.53	72.4%	89.95	37.67	58.1%
Total Cyanide	7.18	6.48	9.7%	5.69*	5.12*	10.0%
Total Metals	149.56	40.83	72.7%	160.90	51.15	68.2%

*25% or more samples measured below the detection limit.

Total metals=Cd+Cr+Cu+Pb+Hg+Ni+Ag+Zn; excludes hexavalent chromium and total cyanide

POTW Effluent Dissolved Metals Study

Throughout 2019, the NBC continued to monitor the dissolved metals fraction of the effluent discharged to the receiving waters of the Providence and Seekonk Rivers. Dissolved metals were measured in monthly samples, while total metals were measured twice per week. The NBC and DEM use this 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 especially 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 of a POTW, the DEM must use a “metals translator conversion factor” to estimate the fraction of the total metals load that will be in the dissolved phase in the effluent. By sampling for both total and dissolved metals, the NBC is able to calculate the ratio of dissolved to total metals in POTW effluent and in the receiving waters and inform such permit limit calculations.

TABLE 32 summarizes the data from 2019 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 and Bucklin Point, some of the dissolved cadmium, lead, and silver samples were reported as less than the detection limit; at Field's Point, several dissolved aluminum samples were also reported as less than the detection limit. Censorship in these metals impacted 67% (cadmium and aluminum) to 100% (lead) of samples at Field's Point, and from 8% (cadmium) to 83% (silver) of samples at Bucklin Point. Censorship also occurred in some total cadmium, lead, and silver sample results used in this comparison for Field's Point. Note that averages were calculated for censored metals using substitution of the detection limit value, therefore overestimating the true concentrations.

TABLE 32
2019 Final Effluent Phase Partitioning Study Results

Dissolved/Total Shown as a Ratio		
	Field's Point Mean	Bucklin Point Mean
Aluminum	0.66*	0.46
Cadmium	0.99*	0.83
Chromium	1.16	1.25
Copper	0.92	0.71
Iron	0.43	0.43
Lead	0.87*	0.68
Nickel	0.98	0.96
Silver	0.87	0.51*
Zinc	1.03	0.97

* Results impacted by censorship of 50% or more dissolved or total metals results used in ratio calculation.

At Field's Point, the results show cadmium, chromium, copper, nickel, and zinc to be the metals with the highest fraction in the dissolved phase in the final effluent, followed by lead and silver. At Bucklin Point, chromium, nickel, and silver were shown to be the metals with the highest fraction in the dissolved phase, followed by cadmium. Aluminum and iron tend to be more strongly associated with particulates and thus the fraction of the metal in the dissolved phase is typically among the lowest.

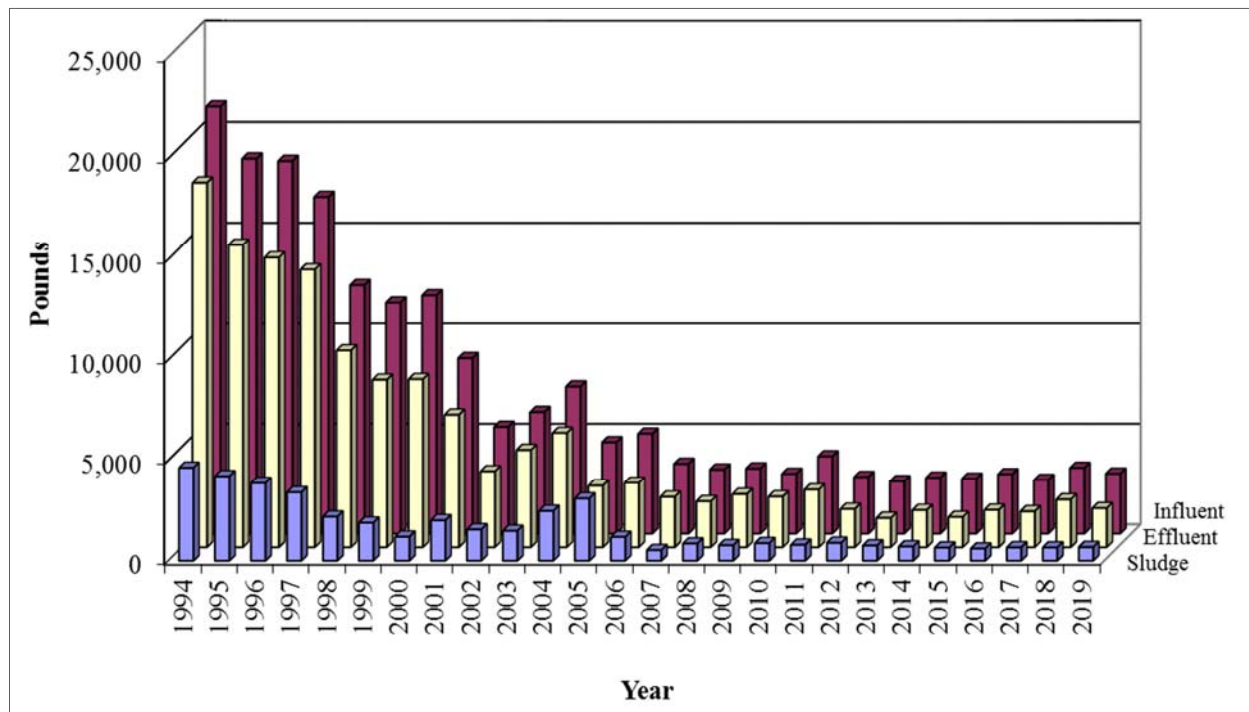
The mean dissolved-to-total ratio of chromium and zinc at Field's Point and chromium at Bucklin Point was above 1.0, indicating a higher concentration in the dissolved phase than was detected in the analysis of the total metal. There are occasionally instances in which the dissolved metals portion is higher than the effluent portion due to equipment precision. Data for 2019 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 and zinc were also chosen due to their relatively high abundance and significant influent sources. 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 2019 sludge metals measurements were conducted at least twice per month 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 2019 sludge data are included in ATTACHMENT VOLUME II, SECTION 10.

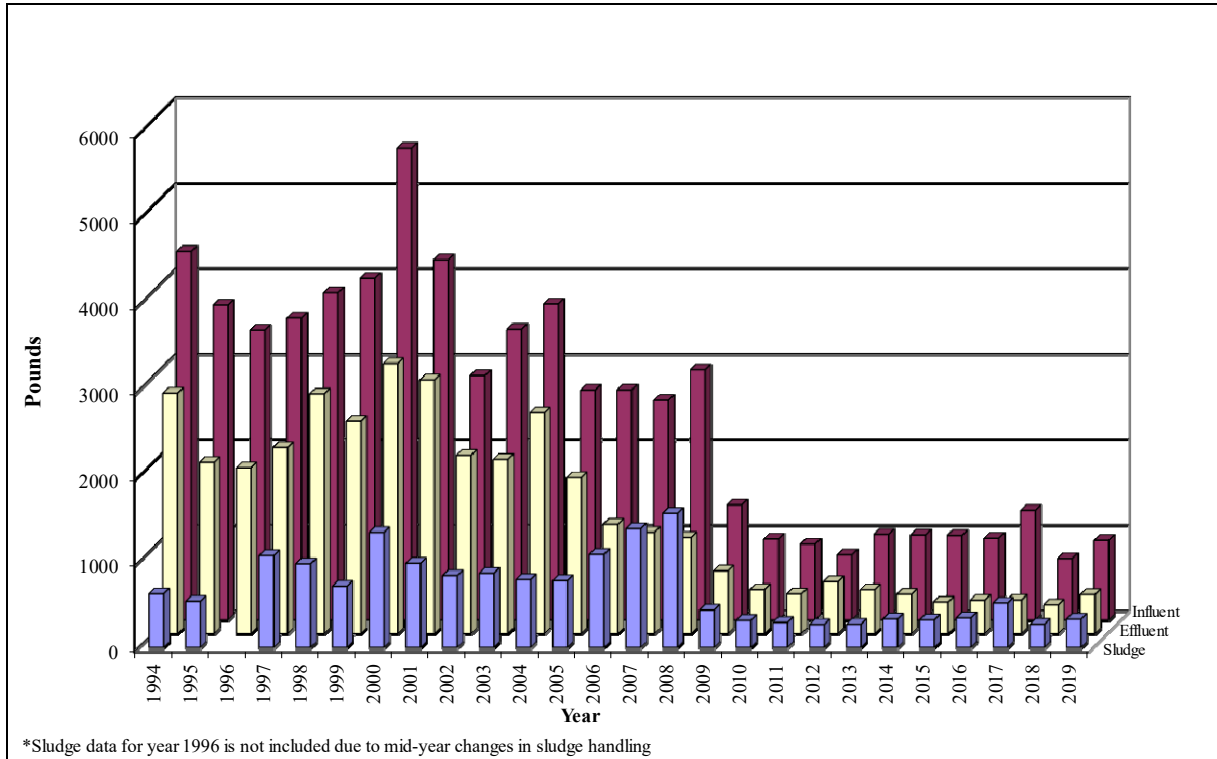
As can be seen in FIGURE 29, nickel inputs in Field's Point influent generally declined from 1994 to 2008 and loadings have been relatively steady since then. The center row of columns on the figure represents final effluent loading. During 2019, Field's Point nickel loading decreased in the influent and effluent but increased slightly in the sludge as compared to 2018. Nickel in the sludge has remained below 1,000 pounds since 2007. The discrepancy between 2019 influent nickel loading compared to sludge and effluent nickel loadings was 14%. This discrepancy is attributed to loading in grit and general variability due to sampling and analytical methods.

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



As can be seen in FIGURE 30, Bucklin Point, nickel loading increased in the influent, effluent, and sludge during 2019 as compared to 2018. In 2019, there was an 18% 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 analytical methods.

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



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 each 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 influent and effluent but increased slightly in the sludge from 2018 to 2019. The discrepancy between Field’s Point influent zinc loading and the combined sludge and effluent zinc was 5%. At Bucklin Point, zinc loading increased in the influent, effluent, and sludge. The discrepancy at Bucklin Point was 1%. These discrepancies can be attributed to loading in the grit.

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

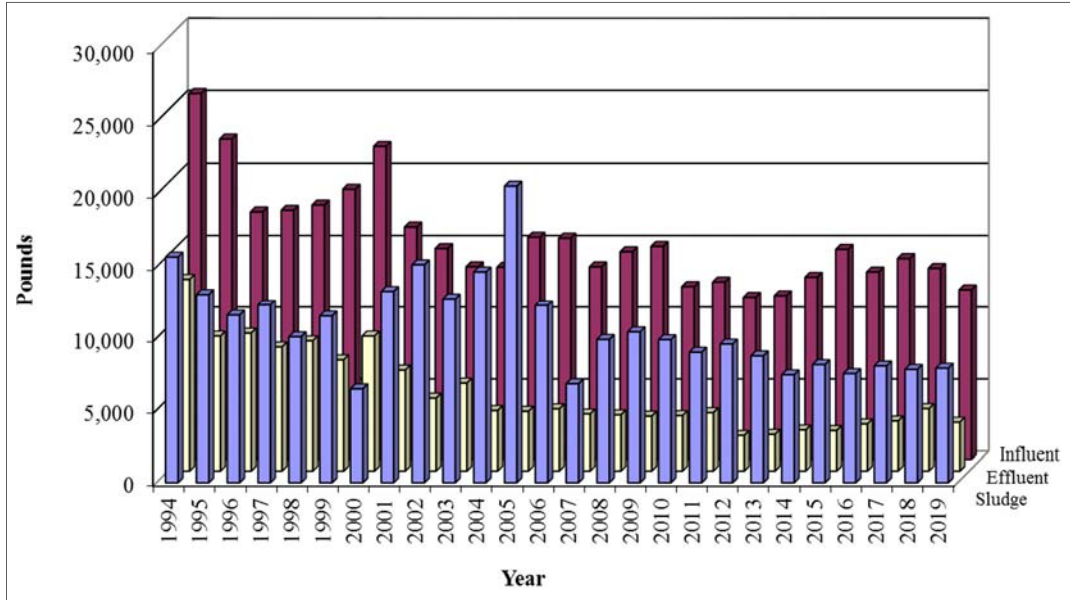
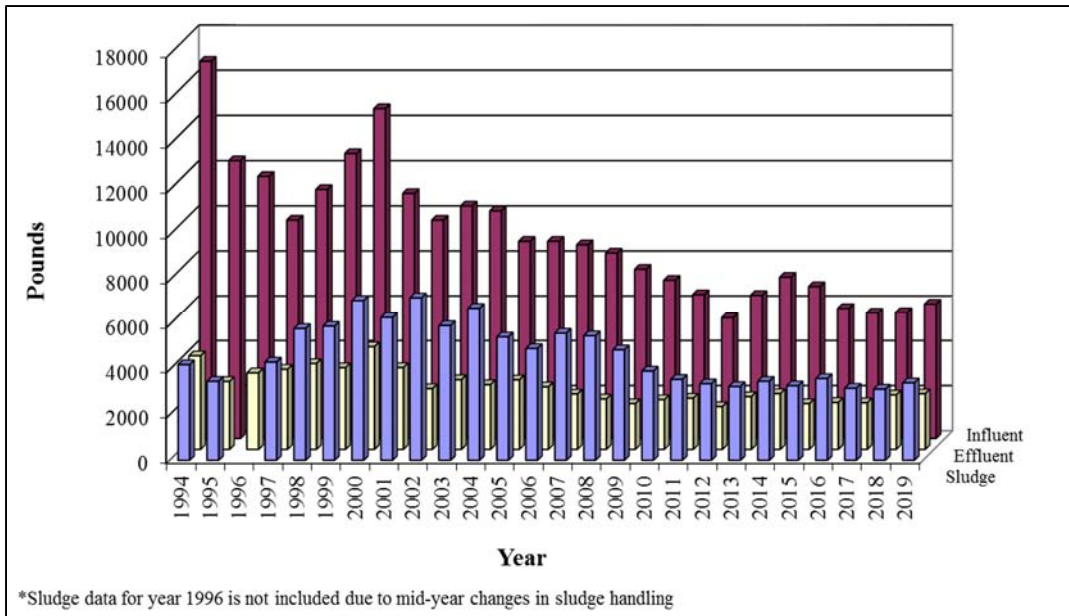


FIGURE 32
Zinc Loading Trend Analysis for Bucklin Point
Sludge, Influent, and Effluent



FIGURES 33 and 34 present the copper loading trend analyses. At Field's Point, copper loading decreased in the influent, effluent, and sludge from 2018 to 2019. The discrepancy between the influent and combined effluent and sludge loading was 4%. At Bucklin Point, copper loadings increased in the influent and sludge, but remained nearly the same in the effluent as there was a slight increase of 2 pounds. The discrepancy between the influent and combined effluent and sludge loading was 5%. These discrepancies can be attributed to the loading in the grit.

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

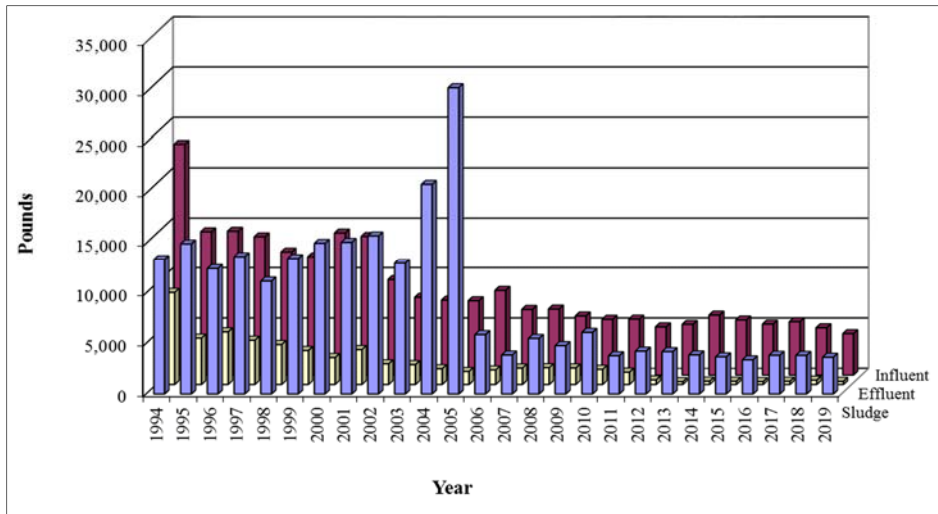
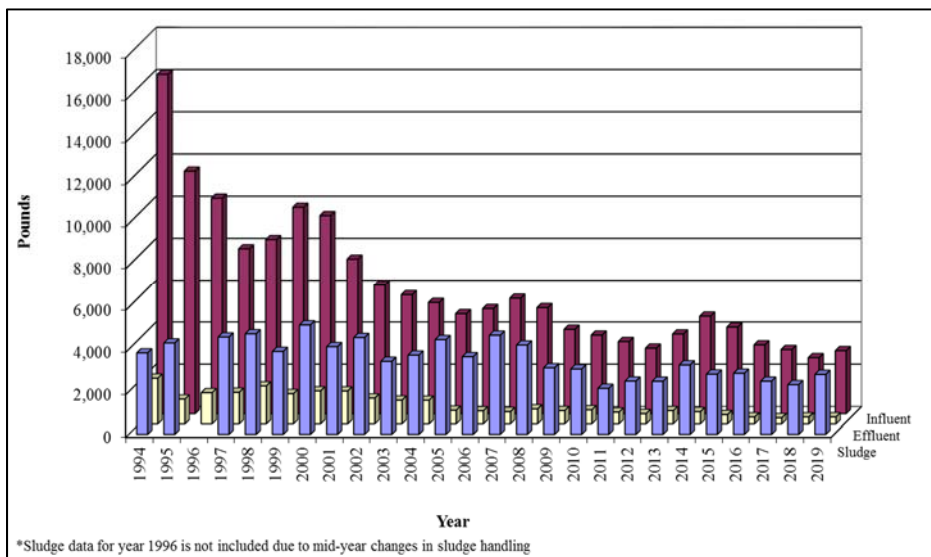


FIGURE 34
Copper Loading Trend Analysis for Bucklin Point
Sludge, Influent, and Effluent



CBOD and TSS Loadings

CBOD and TSS loading historical trend analysis provides an interesting means of determining the ability of the individual facility to handle variability in influent loadings without disruption of plant operations. While previous RIPDES permits required BOD monitoring in the influent and effluent, the current permits replaced BOD monitoring with CBOD monitoring. The following figures retain the historical BOD loading data through the last date of monitoring on November 30, 2017.

For Bucklin Point, FIGURES 35 and 36 show the 30-day average trend for influent and effluent BOD, CBOD, and TSS, respectively. Historical 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 that began to go online that year.

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

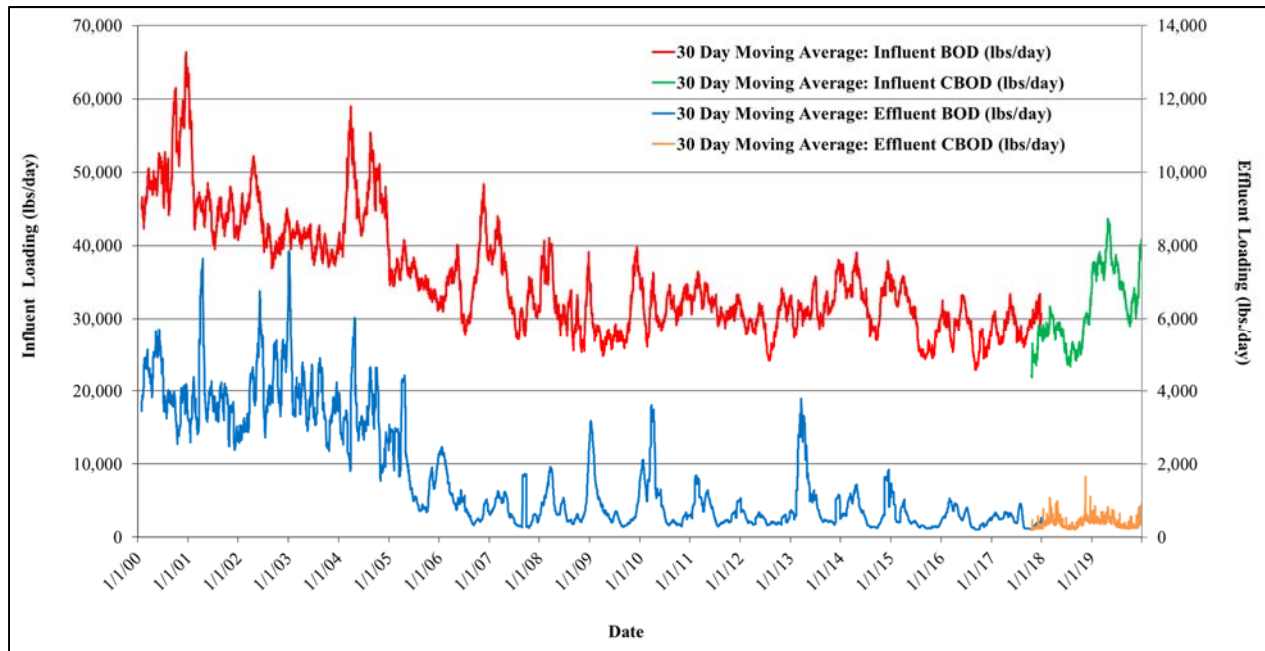
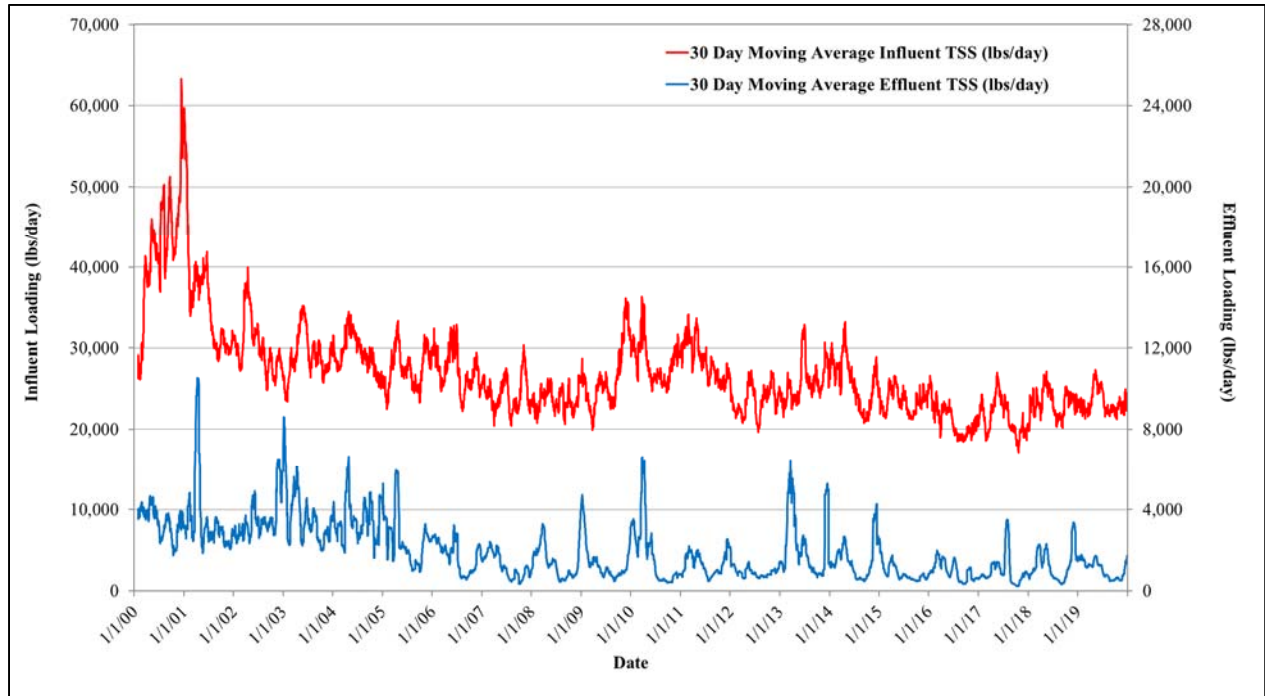


FIGURE 36
TSS Loading Trend Analysis for Bucklin Point Influent and Effluent



FIGURES 37 and 38 show the 30-day average BOD, CBOD, and TSS data for Field’s Point. It is estimated that at Field’s Point, flow coming from the CSO tunnel accounts for approximately 2.7% of influent CBOD and approximately 6.8% of the influent TSS loading. Periods of high influent loading are possibly attributable to maintenance within the collection system, or wet weather events. 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, and the ability of Operations staff to effectively adjust conditions to treat incoming pollutants. FIGURES 37 and 38 show a decline and less variable effluent BOD and TSS beginning in 2012 at Field’s Point, which is most likely attributable to plant upgrades associated with the BNR treatment process, parts of which became operational in 2012.

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

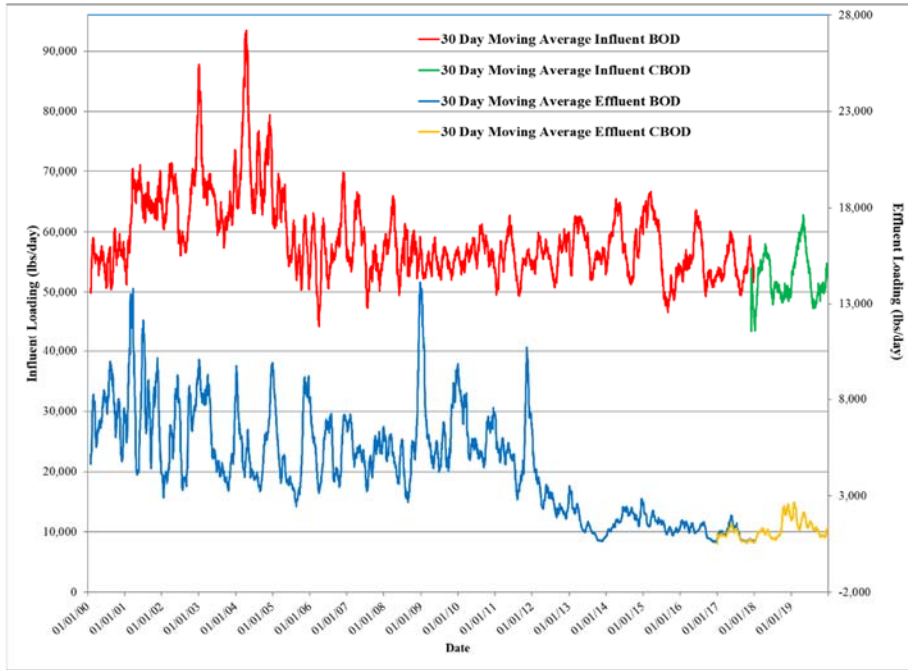
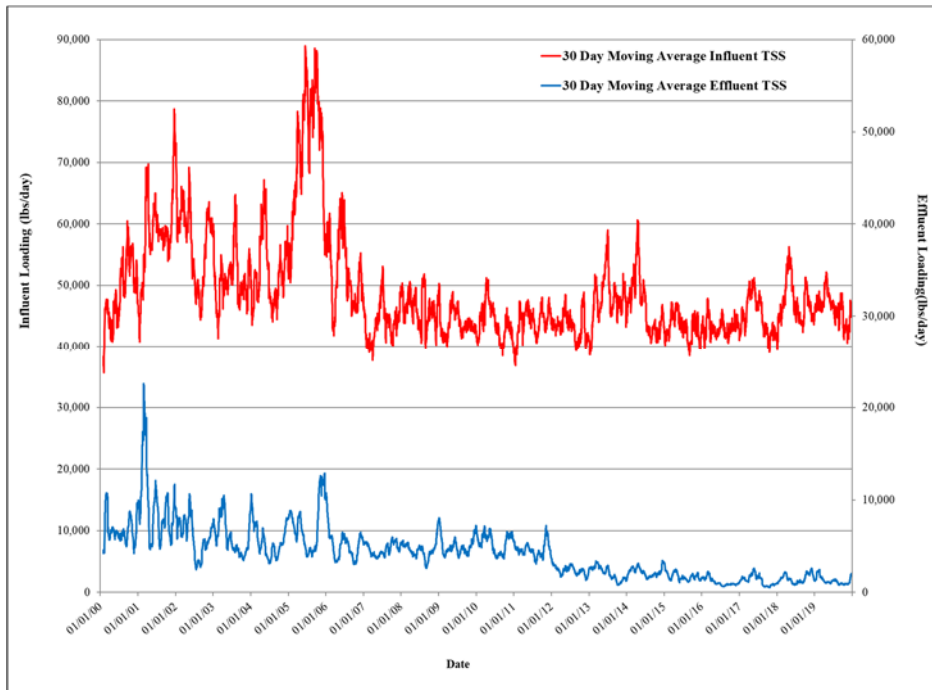


FIGURE 38
TSS Loading Trend Analysis for Field's Point Influent and Effluent



Comparison of Final Effluent Concentrations in 2019 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 33 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 in bold in TABLE 32 exceeded those water quality standards. Dissolved metals are measured monthly at the two plants and total metals are measured twice per week. Saltwater water quality criteria are set for dissolved metals, based on a metals 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 found both the Seekonk and Providence River reaches of Narragansett Bay meeting EPA water quality criteria for metals. These findings were presented to DEM. As a result of this work the Seekonk and Providence rivers were removed from the state EPA 303(d) list of impaired water bodies for metals.

TABLE 33
Comparison of 2019 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	3.9	1.9	3.1	
	Dissolved phase effluent annual maximum	5.8	3.0		4.8
	Total effluent annual average	5.0	2.2		
	Total effluent annual maximum	8.2	6.3		
Lead	Dissolved phase effluent annual average	0.37	0.30	8.1	
	Dissolved phase effluent annual maximum	0.56	0.30		210
	Total effluent annual average	0.53	0.37		
	Total effluent annual maximum	0.77	1.13		
Nickel	Dissolved phase effluent annual average	6.3	14.6	8.2	
	Dissolved phase effluent annual maximum	13.1	17.6		74
	Total effluent annual average	7.2	13.7		
	Total effluent annual maximum	23.8	25.8		
Silver	Dissolved phase effluent annual average	0.02	0.02		
	Dissolved phase effluent annual maximum	0.03	0.04		1.9
	Total effluent annual average	0.06	0.03		
	Total effluent annual maximum	0.30	0.09		
Zinc	Dissolved phase effluent annual average	37.86	24.1	81	
	Dissolved phase effluent annual maximum	47.65	28.5		90
	Total effluent annual average	37.67	23.5		
	Total effluent annual maximum	54.32	38.6		
Mercury	Dissolved effluent annual average	NM	NM	0.94	
	Dissolved effluent annual maximum	NM	NM		1.8
	Total effluent annual average	0.003	0.002		
	Total effluent annual maximum	0.006	0.005		
Total Cyanide	Total effluent annual average	5.1	6.5	1	
	Total effluent annual maximum	10.5	26.3		1
pH	Total effluent annual minimum (s.u.)	6.03	6.23	> 6.5 < 8.5	
	Total effluent annual maximum (s.u.)	6.97	7.18		> 6.5 < 8.5
Enterococci Bacteria	Total effluent annual geometric mean	6.3	7.5	35	104
Fecal Coliform Bacteria	Total effluent annual geometric mean	6.4	2.3	50	400

*Results in bold exceed the water quality criteria.

From TABLE 33, the following conclusions can be made regarding the various pollutant parameters:

- Dissolved copper concentrations at Field's Point met both the acute and chronic water quality criteria while concentrations at Bucklin Point exceeded them. However, effluent concentrations are rapidly diluted as the effluent enters the mixing zone of 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 acute and chronic water quality criteria at both facilities. The annual maximum for total lead at Field's Point is 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 were all below the acute water quality criterion. There is no chronic saltwater water quality criterion established for silver.
- Maximum and average dissolved zinc concentrations at both facilities are less than the acute and chronic water quality criteria.
- The annual average and maximum effluent total cyanide concentration 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.
- pH annual effluent maxima were within water quality criteria at both plants, however the effluent minima exceeded water quality criteria.
- The annual geometric mean of all fecal coliform bacteria sample results was used to determine whether the facilities met the chronic water quality criterion, 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; neither facility had any sample results greater than 400 MPN/100 mL in 2019.

- The annual geometric mean of all enterococci bacteria sample results was used to determine whether the facilities met the chronic water quality criterion, while a count of the number of samples that exceeded 104 MPN/100 mL was used to establish whether the acute water quality criterion was met. Both facilities remained well below the 35 MPN/100 mL chronic water quality criterion, while 0.8% of enterococci samples at Field's Point were above the 104 MPN/100 mL acute water quality threshold. All Bucklin Point samples remained below the acute water quality threshold during 2019.

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 the 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 on July 1, 2015. Prior to this date, any result that was reported as less than the detection limit of 2.0 MPN/100 mL was replaced with a 2 when calculating geometric means. After July 1, 2015 any result that was reported as <2.0 MPN/100 mL was replaced with a result of 1 MPN/100 mL. This rule was reverted back on June 1, 2019, when DEM again asked that all results less than the detection limit be substituted with the detection limit value. For enterococci, results less than the detection limit have always been substituted with the detection limit itself as these samples are often analyzed after dilution, which causes a proportionate increase in the detection limit. 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 DMR methods in use at the time of original reporting.

Field's Point Facility

New RIPDES permits were issued for both Field's Point and Bucklin Point that became effective on December 1, 2017, replacing the permits previously in effect since 2001. TABLE 34 lists the limits for metals and cyanide under the current permit. TABLE 34 also presents the measured maximum daily values and maximum monthly averages for the Field's Point facility for parameters of interest during the months of 2019 under this permit. It should be noted that available cyanide is reported in the table below as this is what the NBC reports on the DMR. The parameters *Americamysis bahia* and *Arbacia punctulata* represent the whole effluent toxicity, or bioassay, testing requirements of the RIPDES permit. The NBC formally contested several of the new permit requirements, which were initially stayed in a Consent Order, though ultimately upheld in a subsequent Consent Agreement with DEM, effective September 5, 2018.

**TABLE 34
Comparison of Field's Point RIPDES & Temporary Effluent Limits
with 2019 Wastewater Treatment Facility Results**

Parameter	RIPDES Permit Limits		2019 Results	
	Maximum Daily (ppb)	Average Monthly (ppb)	Maximum Daily* (ppb)	Average Monthly* (ppb)
Arsenic	306.3	5.4	2.92	2.46
Copper	24.5	24.5	6.27	3.02
Nickel	331	127	25.83	16.13
Available Cyanide**	4	4	20.80	2.60
CBOD Percent Removal***	-	≥85%	-	95.4
TSS Percent Removal***	-	≥85%	-	95.7
Enterococci	276 CFU/100 ml	35 CFU/100 ml	254.1 MPN/100 mL	19.9 MPN/100 mL
<i>Americamysis bahia</i> (LC50)***	100% or greater	-	>100%	-
<i>Arbacia punctulata</i> (C-NOEC)***	---%	-	50%	-

*For comparison to the RIPDES permits, the highest maximum daily value and the highest average monthly value reported for 2019 is listed in the table.

**Note that the limits for compliance/noncompliance determinations are based on the quantitation limit, which is defined as 10.0 ppb for available cyanide.

***Permit limits for percent removals and bioassays are set for the minimum, not maximum. The percent removal 2019 results represent the minimum average monthly percent removals. The bioassay 2019 results represent the minimum quarterly results.

TABLE 35 shows that in 2019, Field’s Point was in compliance with the daily and monthly discharge limitations specified in the RIPDES permit for all toxic pollutant parameters listed in the table, except for maximum daily available cyanide. The quantitation limit of 10.0 ppb is used to determine actual compliance for this parameter. In August, September, and October, maximum daily available cyanide values were 20.8 ppb, 15.5 ppb, and 14.3 ppb, respectively. The NBC met CBOD and TSS percent removal limits in all months of 2019, as well as enterococci daily maximum and monthly average limits. All bioassay results also met the permit limits in 2019.

TABLE 35
2019 Compliance Status with
RIPDES & Temporary Effluent Limits for Field’s Point

Parameter	2019 Compliance with RIPDES Permit Limits?	
	Maximum Daily	Average Monthly
Arsenic	Yes	Yes
Copper	Yes	Yes
Nickel	Yes	Yes
Available Cyanide*	No	Yes
CBOD Percent Removal	-	Yes
TSS Percent Removal	-	Yes
Enterococci	Yes	Yes
<i>Americamysis bahia</i> (LC ₅₀)	Yes	-
<i>Arbacia punctulata</i> (C-NOEC)	-	-

*Note that the limit for compliance/noncompliance determinations is the quantitation limit, which is defined as 10.0 ppb for available cyanide.

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 2001 and 2002. The results of the metal translator studies found the Providence and Seekonk Rivers met water quality criteria for the trace metals analyzed which were 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

As noted above, new RIPDES permits were issued for both Field's Point and Bucklin Point that became effective on December 1, 2017, replacing the permits previously in effect since 2001. The NBC contested several of the new Bucklin Point permit limits, including those for effluent total copper and total nickel. On September 5, 2018, the NBC and DEM signed Consent Agreement RIA-424, setting interim limits for total copper and total nickel in the effluent. TABLE 35 outlines the current RIPDES permit limits for metals, cyanide, and a subset of additional parameters relevant to this chapter; the Consent Agreement limits and a summary of 2019 effluent results are also provided for comparison.

TABLE 36 and TABLE 37 indicate that Bucklin Point was unable to meet the originally issued maximum daily and average monthly permit limits for copper, but was able to meet the Consent Agreement limits. Available cyanide results exceeded the maximum daily RIPDES permit limit, though in this case compliance is determined based on a quantitation limit of 10 ppb, which the facility was able to meet. The remaining parameters including nickel, zinc, CBOD percent removal, TSS percent removal, enterococci, and the bioassay parameters remained in compliance with RIPDES permit limits throughout 2019.

TABLE 36
Comparison of Bucklin Point RIPDES & Interim Effluent Limits with
2019 Wastewater Treatment Facility Results

Parameter	RIPDES Permit Limits		Consent Agreement Limits		2019 Results	
	Maximum Daily (ppb)	Average Monthly (ppb)	Maximum Daily (ppb)	Average Monthly (ppb)	Maximum Daily (ppb)	Average Monthly* (ppb)
Copper	6.5	6.5	86.1	29.8	8.17	6.85
Nickel	70.3	14.3	70.3	25.0	23.80	11.03
Zinc	85.6	85.6	-	-	54.32	43.45
Available Cyanide**	0.8	0.8	-	-	4.97	0.55
CBOD Percent Removal***	-	≥85%	-	-	-	98.9
TSS Percent Removal***	-	≥85%	-	-	-	92.0
Enterococci	276 cfu/100 mL	35 cfu/100 mL	-	-	34.6 MPN/100 mL	7.6 MPN/100 mL
<i>Americamysis bahia</i> (LC ₅₀)***	100% or greater	-	-	-	>100%	-
<i>Arbacia punctulata</i> (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 10.0 ppb for cyanide.

***Permit limits for percent removals and bioassays are set for the minimum, not maximum. The percent removal 2019 results represent the minimum average monthly percent removals. The bioassay 2019 results represent the minimum quarterly results.

TABLE 37
2019 Compliance Status with
RIPDES & Interim Effluent Limits for Bucklin Point Facility

Parameter	2019 Compliance with RIPDES Permit Limits?		2019 Compliance with Consent Agreement Limits?	
	Maximum Daily	Average Monthly	Maximum Daily	Average Monthly
Copper	No	No	Yes	Yes
Nickel	Yes	Yes	Yes	Yes
Zinc	Yes	Yes	-	-
Available Cyanide*	Yes	Yes	-	-
CBOD Percent Removal	-	Yes	-	-
TSS Percent Removal	-	Yes	-	-
Enterococci	Yes	Yes	-	-
<i>Americamysis bahia</i> (LC ₅₀)	Yes	-	-	-
<i>Arbacia punctulata</i> (C-NOEC)	Yes	-	-	-

*Note that the limit for compliance /noncompliance determinations is based on the quantitation limit which is defined as 10.0 ppb for cyanide.

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. The Pretreatment and TAC 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 EM 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 public interest. The Laboratory continues to improve analytical procedures and research new technologies to improve the accuracy of all analytical procedures and 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 of 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 2018 to 2019 decreased by 10.4% at Field's Point while loading increased by 9.7% at Bucklin Point. In the effluent, total metals loadings decreased in 2019 at Field's Point by 20.6%, or 1,513.9 pounds, and increased at Bucklin Point by 5.4%, or 169.9 pounds compared to 2018. Although metals loading increased in the influent and effluent this year at Bucklin Point, loadings to and from both plants remained far below historical loadings. Overall, 2019 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 2019 and 1,629 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:

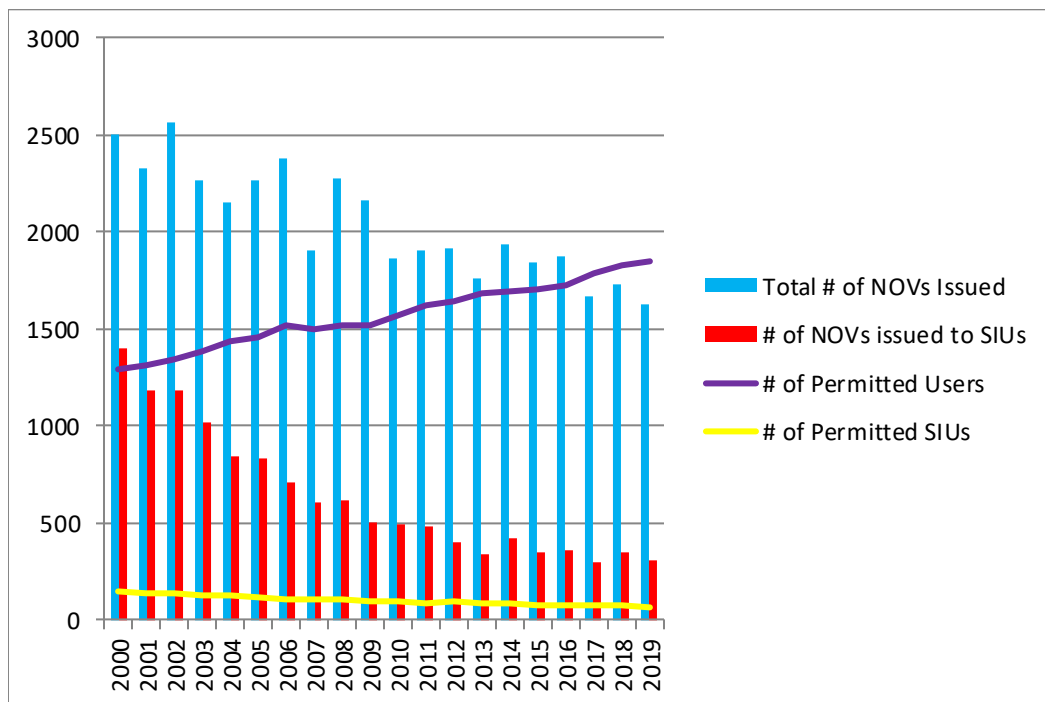
- *Telephone calls* to users are made daily to discuss violations and problems. These calls are often sufficient to bring the user into compliance. A telephone log sheet documenting the conversation is prepared and placed in the user file or in some cases a letter may be sent to the user summarizing 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, NOV's refer the user to the Pollution Prevention Program which offers free technical and compliance assistance. The most typical NOV's are described below. TABLE 38 describes each type of NOV that is issued and the number of each issued in 2019. Examples may be viewed in ATTACHMENT VOLUME I, SECTION 4.

TABLE 38
2019 Notices of Violation

NOTICE OF VIOLATION	DESCRIPTION	NUMBER ISSUED IN 2019
Letter of Deficiency	<ul style="list-style-type: none"> • Issued by certified mail • Notifies users of deficiencies identified during inspections • Requires corrective actions with specific due dates 	76
Failure to Meet Standards	<ul style="list-style-type: none"> • 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 	129
Notice of pH Violations	<ul style="list-style-type: none"> • Issued each time a user violates the high or low pH limit as indicated on the user monthly pH report 	107
Failure to Submit Monitoring Reports	<ul style="list-style-type: none"> • 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 	782
Failure to Complete or Sign Required Reports	<ul style="list-style-type: none"> • Issued to users that do not complete or sign SMCRs or pH Monitoring Reports 	5
Failure to Sample and/or Analyze for All Parameters	<ul style="list-style-type: none"> • Issued to users that did not sample for and/or analyze all required parameters required by their permits 	5
Failure to Immediately Report Violations	<ul style="list-style-type: none"> • 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) 	35
Failure to Satisfy NBC Requirements	<ul style="list-style-type: none"> • Issued to users that fail to submit required documents or exceeding required completion dates 	490
Failure to Pay Permit Fees	<ul style="list-style-type: none"> • Issued to users greater than 90 days late in paying permit fees 	0
Total Notice of Violation Letters Issued		1,629

FIGURE 39 graphically shows the number of NOV's issued to all users, the number of NOV's issued to SIUs and the number of permitted users for the period of 2000 through 2019. As can be seen, the total number of NOV's issued is relatively consistent from year to year. There was a 5.9% decrease in the number of NOV's issued to SIUs in 2019 when compared to 2018. The number of NOV's issued to SIUs has steadily declined from 2000 to 2017. In fact the number of SIU NOV's decreased by 78.4% since 2000. The number of permitted users increased steadily since 2000. For the period of 2000 to 2019 there has been an overall increase of 42.4% in the number of permitted users. This drastic decrease in the number of NOV's issued to SIUs and the declining trend observed in NOV's 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 Technical Assistance staff.

FIGURE 39
NOV's ISSUED TO ALL USERS AND SIUs 2000 – 2019



- 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 2019, 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 nine firms found to be in SNC with NBC regulations were listed in an advertisement in the PROVIDENCE JOURNAL on February 27, 2020 for violations occurring between October 1, 2018 and December 31, 2019. A copy of this public notice is provided later in this chapter in FIGURE 40.
- *Letters from the Legal Section* are issued to companies that have not submitted required reports, plans, and permit applications within 120 days of the due date. These letters inform the company that if the required information is not submitted within 30 days escalated enforcement action may be initiated. The issuance of these letters often results in the immediate submission of the outstanding report/plan/application. In 2019 the Legal Section issued 37 of these letters.
- *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 2019, no civil suits were filed.

2019 Escalated Enforcement Actions

During 2019 the NBC issued two Administrative Orders (AO) for violations of NBC Rules and Regulations and/or permit requirements, resolved one pending AO through execution of a Consent Order, and closed out a 2018 Letter Agreement associated with a 2017 AO. A sample AO is provided in ATTACHMENT VOLUME I, SECTION 4. Furthermore, a history of enforcement actions taken by the NBC from January 1, 2009 through December 31, 2019 is found at the end of this chapter in TABLE 40. The table provides a history of the penalties assessed, the penalties paid and the present status of each enforcement action. A brief summary providing an update on the status of pending AOs is provided later in this chapter.

Field's Point District

- AO #FP-01-19 was issued against Extreme Auto Recondition and Anyelo Junco on December 26, 2019. The AO cited the company and Mr. Junco for failure to submit plans to install an oil solids/grit removal system; failure to install an oil solids/grit removal system, failure to submit Self-Monitoring Compliance Reports (SMCR), and failure to pay wastewater discharge permit fees. The AO ordered Extreme Auto Recondition and Mr. Junco to submit plans to the NBC for the installation of an oil and solids/grit removal system, install the oil and solids/grit removal system after approval of the plan, submit all outstanding SMCRs, immediately begin to timely submit all required SMCRs, and immediately pay the outstanding balance on its pretreatment account. An Administrative Penalty of \$8,500 was assessed. Extreme Auto Recondition and Mr. Junco failed to respond to the AO and failed to preserve their right to an administrative hearing. Accordingly, the NBC will take steps in 2020 to enforce the AO.
- AO #FP-02-19 was issued against Providence Specialty Products, LLC, a cheese manufacturer, and Mark Federico, Sr. on December 26, 2019. The AO cited the company and Mr. Federico for failure to comply with NBC effluent pH limitations, failure to comply with NBC effluent discharge limitations for Total Oil and Grease (fats, oils, and grease), failure to notify the NBC of discharge violations within 24 hours of discovering the violations, failure to submit SMCRs on time, failure to submit pH Monitoring Reports on time, and failure to comply with various NBC requirements, namely failure to maintain a logbook of pH probe cleanings and calibrations, failure to accurately record pH values, failure to maintain a log book of boiler and water softener discharges and maintenance, and failure to remove a discharge hose from the boiler. The AO ordered Providence Specialty Products, LLC and Mr. Federico to submit all pH reports and SMCRs and to take steps to ensure future reports are timely submitted, implement steps to ensure that notification of discharge violations is given within 24 hours of becoming aware of the violation, develop and submit a plan to maintain compliance with NBC effluent pH discharge limitations and discharge limitations for Total Oil and Grease (fats, oils, and grease), and implement said plan after review and approval. The AO also notified Providence Specialty Products, LLC and Mr. Federico that failure to develop and submit the compliance plan, followed by implementation of the plan, would result in the automatic imposition of a \$20,000 administrative penalty.

Providence Specialty Products and Mr. Federico preserved their right to an administrative hearing and requested a status conference on the matter. The status conference was held on January 29, 2020. The NBC will work with Providence Specialty Products and Mr. Federico in 2020 in an effort to resolve the AO.

Update of Past Enforcement Actions

Field's Point District

- AO #FP-01-17 was issued against Rain Car Wash, a hand car wash company, and Kelvin Sanders, the company president, on April 27, 2017. The AO cited the company for failure to submit plans for the installation of an oil and solids/grit removal system and failure to submit Self-Monitoring Compliance Reports and analytical results for total oil and grease. The AO ordered Rain Car Wash to submit plans for the installation of an oil and solids/grit removal system, implement the plan after review and approval, submit Self-Monitoring Compliance Reports as required by the company's permit, and pay an Administrative Penalty of \$4,000. On May 3, 2018 NBC and Rain Car Wash entered into a Letter of Agreement acknowledging that Rain Car Wash was no longer in operation at the location identified in the AO and establishing a payment plan for the outstanding portion of the total \$4,000 Administrative Penalty assessed. Final payment toward the Administrative Penalty was received in 2019 and this matter is now closed.
- AO #FP-02-18 was issued against DiFruscia Industries, Inc., a metal finishing facility, and Frank DeFruscio, the company president, on December 27, 2018. The AO cited the company for failure to comply with NBC effluent discharge limitations for copper, cyanide, nickel, and zinc; failure to accurately report pH monitoring results; failure to satisfy NBC requirements, namely failure to submit Baseline Monitoring Analysis, a report on erratic pH readings, a manhole violation report, resampling results, and notification of changes to its pretreatment system; failure to submit pH Monitoring Reports on time; failure to submit Self-Monitoring Compliance Reports on time; and failure to pay the annual Wastewater Discharge Permit fees. The AO ordered DiFruscia Industries and Mr. DeFruscio to: submit a proposal to reduce effluent concentrations and eliminate pH violations; implement the plan after review and approval of the same; immediately begin to submit all required compliance monitoring reports and other required documentation by the specified deadlines; and pay the outstanding permit fee balance. The AO also assessed an Administrative Penalty of \$18,850. DiFruscia Industries and Frank DeFruscio preserved their right to an administrative hearing and requested a status conference on the matter. A status conference was held on January 17, 2019. A Consent Order was negotiated and executed on September 3, 2019 wherein DeFruscio Industries agreed to submit its pH Monitoring Compliance Reports on time; submit its Self-Monitoring Compliance Reports on time; comply with NBC's effluent discharge limitations for copper, cyanide nickel and zinc; remove its anodizing line and install a holding tank per approved pretreatment plans, and, conduct monthly staff training for employees involved in the process wastewater and pretreatment operations. DiFruscia Industries also agreed to pay an Administrative Penalty of \$13,195 in 12 monthly installments. As of February 1, 2020, \$7,697.06 of the Administrative Penalty has been paid, leaving a balance of \$5,497.94.

2019 Civil Suits

During 2019 the NBC did not issue any civil suits against a permitted company for violations of the Rules and Regulations and/or the terms of a Wastewater Discharge Permit. Below is an update of the civil action (CA) that was filed in 2012.

- CA #12-2600 was filed against Providence Specialty, a SIU conducting cheese manufacturing operations, in Superior Court in May 2012. This company accrued an outstanding balance due to non-payment of permit fees and BOD/TSS surcharges. The NBC and Providence Specialty executed a Consent Order on January 31, 2013 to resolve the civil suit wherein Providence Specialty agreed to pay the NBC the total amount of \$90,527.11 via monthly installments. A Stipulation was filed with the court on February 8, 2013 closing out the civil suit. The final payment due pursuant to the Stipulation was made in 2019 and this matter is now closed.

Permit Suspensions

As stated in Section 1.8.14 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 2019, 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).



Volunteers participate in a Town of Lincoln Earth Day clean-up event sponsored by the NBC EEF.

In 2019, four proposals were submitted to the NBC Board of Commissioners for review and was approved, awarding \$11,000 collected from environmental violations to projects that enhance the Rhode Island environment and environmental education.

Since the late 1990s, the NBC has successfully sponsored large Earth Day river cleanup events 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 to multiple rivers throughout the NBC service area rather than focusing solely on the Woonasquatucket River. The NBC continued this grant program in 2019 and was able to assist numerous local organizations, cities and towns by providing 22 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 2019 are listed below in TABLE 39.

TABLE 39
2019 Approved Environmental Enforcement Fund Proposals

EEF#	Company	Project	Amount Awarded
19-001	NBC Earth Day Clean-Up Grant Program awards to 20 agencies.	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.	\$11,100.00
19-002	Blackstone Valley Tourism Council	Allowing students to participate in the Riverclassroom River Study program aboard the Blackstone Valley “Explorer” riverboat.	\$2,600.00
19-003	Rocky Hill Country Day School	Rhode Island Hack for Greater Good Hackathon – searching for solutions to water pollution and plastics.	\$2,500.00
19-004	NBC Educational installment	Demonstrate the size and scope of a sample interceptor and explain how proper flow is important and the detrimental effects of grease and disposable wipes on the environment and public health.	\$5,000.00
Total Approved in 2019			\$21,200.00

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, 2018 through December 31, 2019 were published in an advertisement in the PROVIDENCE JOURNAL on February 27, 2020. 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 nine firms were listed in the February 27, 2020, public notice in the Providence Journal. Of the nine firms listed in SNC, six users are located in Field's Point and three are located in Bucklin Point users. There were no firms in SNC subject to EPA categorical standards. Three firms are classified as non-categorical significant industrial users. One is located in Field's Point and conducts cheese manufacturing operations. The other two are located in Bucklin Point. One firm conducts industrial laundry operations and the other firm conducts chemical manufacturing 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 conducts zero discharge copper forming operations. One firm conducts zero discharge machining operations. One firm conducts mass finishing operations. The final firm performs vehicle maintenance operations. Five of the non-significant industrial users are located in the Field's Point district and one is located in the Bucklin Point district. As noted there were nine firms listed in SNC in 2019, an increase from the seven firms listed in SNC in 2019. All but one of the nine users listed in the February 27, 2020, 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. The firm that had not returned to full compliance, a cheese manufacturing facility, was published in SNC for exceeding NBC discharge limits and failing to submit reports on time. An Administrative Order was issued to this firm in late 2019 for these violations. One firm, a SIU, was published in SNC for exceeding NBC discharge limitations. Seven of the remaining eight firms were published in SNC for failure to submit reports on time, which are administrative violations. One of these firms is an SIU. The remaining firm, a SIU, was published in SNC for exceeding NBC discharge limits and failure to submit reports on time. 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 2019, the NBC recognized sixteen SIUs for achieving perfect compliance with the terms of their permits and the NBC Rules and Regulations. These sixteen SIUs will be recognized at awards ceremony in April 2020. The 2019 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
2019 SIGNIFICANT NON-COMPLIANCE PUBLIC NOTICE
THE PROVIDENCE JOURNAL
FEBRUARY 27, 2020

The Narragansett Bay Commission

PUBLIC NOTICE

Firms in Significant Non-Compliance

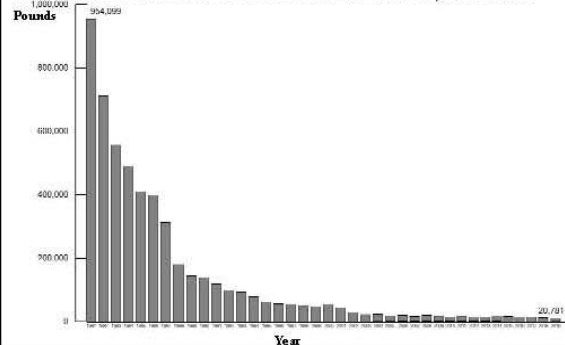


THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGULATION 40 C.F.R. 403.8(f) (2) (vi) and Article 10 of the Narragansett Bay Commission, Rules and Regulations require the NBC to publish annually the names of all industrial users in Significant Non-Compliance (SNC) with pretreatment standards and other 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, 2018 through December 31, 2019. The parameter for which a company was not in compliance and/or the specific administrative deficiency is 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 violation 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 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 discharges 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 milestone contained in a Commission notification, 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 non-compliance;
- (8) Any other violation or group of violations which the Commission determines has adversely effected the operation or implementation of the Industrial Pretreatment Program. *

Total Metals Influent to Field's Point WWTF, 1981-2019



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 in 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 Pollution Prevention assistance program. For information on how the NBC can help your firm achieve and maintain compliance, contact the NBC Technical Analysis and Compliance Section at 461-8848/TDD 461-6549 to schedule a free Pollution Prevention audit.

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 954,099 pounds of heavy metals such as copper, nickel and zinc and 80,440 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 97.8% and 98.7% respectively. Similar toxic loading reductions have been observed at the NBC Bucklin Point facility. **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.**

Bucklin Point Service Area

Company Name	Violations Cited	Present Status
Lincoln		
Macon Group, LLC - db a Lincoln Fine Ingredients	O&G (2)	Firm is now in compliance
Pawtucket		
R & D Manufacturing, Inc.	Failure to submit report on time (6)	Report has been received
Cumberland		
Cintex Corporation	Failure to submit report on time (6)	Report has been received

Field's Point Service Area

Company Name	Violations Cited	Present Status
Providence		
Bella's Jewelry	Failure to submit report on time (6)	Report has been received
Mark Precision, Inc.	Failure to submit report on time (6)	Report has been received
Nickel, Brass and Copper Wire, LLC	Failure to submit report on time (6)	Report has been received
Providence Specialty Products, LLC	O&G (1, 2) Failure to submit reports on time (6)	Firm is still out of compliance Reports have been received An Administrative Order was issued requiring the firm to comply with NBC discharge limit and submit reports on time.
Tower Manufacturing Corporation	Failure to submit report on time (6)	Report has been received
United Stated Postal Service - Providence VMF	Failure to submit report on time (6)	Report has been received

Vincent J. Mesolella, *Chairman* • Laxie A. Hornidge, *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
The cost of this public notice will be billed to the firms listed above that were in significant non-compliance.

FIGURE 41 CONFIRMATION PF PUBLICATION OF SNC PUBLIC NOTICE PROVIDENCE JOURNAL

State OKs \$3M for apartments near Pawtucket station

Developer says 150,000-square-foot, six-story building near commuter rail will be city's first new ground-up residential project of its size in at least 20 years

By Patrick Anderson
Contributor

PROVIDENCE — Hoping that what authorities call a "Pawtucket miracle" will allow another construction project to be approved in the city, the Pawtucket City Council on Wednesday approved a \$3-million, 150,000-square-foot, six-story building near the commuter rail station in Pawtucket. The project is estimated to cost \$45 million.

Developer Lee Payne told the Pawtucket City Council that the building would be the first new ground-up residential project of its size in Pawtucket in at least two decades.

"It's going to be very nice quality for the area and we will be compliant

with most of what others, adaptive reuse and mill conversions," Payne said. "We will be a dividend to Providence and definitely a dividend to Pawtucket."

The project is subject to a public hearing before the end of this year and completion of the building before the scheduled opening of the new commuter rail station in July 2015.

Payne hopes to take advantage of Pawtucket's new development legislation passed last year and a "Stage 2" DP that allows a limited array of new city and state laws to be used in the development area to help finance new projects. Pawtucket is still finalizing

its side of the regulations. Commissioner of Planning Matt Shovel said it is too early to know how long the DP package will take.

The Corporation Board in November will vote on Payne's project and will have a \$10-million funding gap.

Payne said he is not a Pawtucket resident and that he is not looking for a Pawtucket home. "I cannot get here and there is nothing," and Commissioner Board member Mike McCalla. "And now, with zoning, you could be a stronger factor for our vision and our vision-making plan."

RISD grad student's rat makes leap to U.S. stamp

It's mythical. It's fresh. It's cute? says Postal Service spokeswoman

By Matthew List
Contributor

PROVIDENCE — The U.S. Postal Service on Wednesday announced a stamp featuring the artwork of a Rhode Island University graduate student. The stamp, featuring a blue rat, is one of 10 new stamps that will be issued in the United States in the next few weeks. The rat, according to the Postal Service, is the "most beautiful rat in the world."



Caroline Chen, a graduate student at RISD, is planning to stay in Providence, where her stamp design (top) is featured on a stamp (bottom) that will be issued in the next few weeks.

of the rat, which is a symbol of good luck and prosperity. The rat is a symbol of good luck and prosperity. The rat is a symbol of good luck and prosperity.

"I'm glad to see that the rat is a symbol of good luck and prosperity. The rat is a symbol of good luck and prosperity. The rat is a symbol of good luck and prosperity."

The rat is a symbol of good luck and prosperity. The rat is a symbol of good luck and prosperity. The rat is a symbol of good luck and prosperity.

about the rat, which is a symbol of good luck and prosperity. The rat is a symbol of good luck and prosperity. The rat is a symbol of good luck and prosperity.

about the rat, which is a symbol of good luck and prosperity. The rat is a symbol of good luck and prosperity. The rat is a symbol of good luck and prosperity.

Prosecutors turn over grand jury evidence in Jeffrey Britt probe

By Matt Mahoney
Contributor

PROVIDENCE — State prosecutors have turned over to the defense grand jury testimony from key witnesses in the money-laundering allegations involving Jeffrey Britt.

The state's attorney general, Nicholas Mattiello, announced the decision on Wednesday. The state's attorney general, Nicholas Mattiello, announced the decision on Wednesday.

The state's attorney general, Nicholas Mattiello, announced the decision on Wednesday. The state's attorney general, Nicholas Mattiello, announced the decision on Wednesday.

The Navigator Bar Connection PUBLIC NOTICE Firms in Significant Non-Compliance

THE NAVIGATOR BAR CONNECTION is a 501(c)(3) non-profit organization that provides legal services to low-income individuals and families. The organization has been identified as being in significant non-compliance with the requirements of the Internal Revenue Code.

The following firms have been identified as being in significant non-compliance:

- 1. [Firm Name]
- 2. [Firm Name]
- 3. [Firm Name]
- 4. [Firm Name]
- 5. [Firm Name]
- 6. [Firm Name]
- 7. [Firm Name]
- 8. [Firm Name]
- 9. [Firm Name]
- 10. [Firm Name]

Company Name	Violation Detail	Current Status
[Firm Name]	[Violation Detail]	[Current Status]
[Firm Name]	[Violation Detail]	[Current Status]
[Firm Name]	[Violation Detail]	[Current Status]
[Firm Name]	[Violation Detail]	[Current Status]
[Firm Name]	[Violation Detail]	[Current Status]
[Firm Name]	[Violation Detail]	[Current Status]
[Firm Name]	[Violation Detail]	[Current Status]
[Firm Name]	[Violation Detail]	[Current Status]
[Firm Name]	[Violation Detail]	[Current Status]
[Firm Name]	[Violation Detail]	[Current Status]

Total Months in State or Paid's Prior WFT, 190-200

Total Months in State or Paid's Prior WFT, 190-200

FIGURE 42
2019 PERFECT COMPLIANCE ADVERTISEMENT
PROVIDENCE JOURNAL
FEBRUARY 27, 2020

NARRAGANSETT BAY COMMISSION

Perfect Compliance

in recognition of Significant Industrial User Perfect Compliance in 2019



The Narragansett Bay Commission recognizes these Significant Industrial User companies for perfect regulatory compliance with Pretreatment Program regulations during 2019:

A. Harrison & Company, Inc.	Godfrey & Wing, Inc. dba Impco
Denison Acquisition Company, LLC dba Denison Pharmaceuticals, LLC	Interplex Engineered Products, Inc.
Electrolizing, Inc.	Prov. Journal Co.
Manchester Street, LLC	- Production Facility
Pawtucket Power Associates	Teknicote, Inc.
Tanury Industries PVD, Inc.	Technodic, Inc.
Providence Metallizing Company, Inc.	Tiffany and Company
Teknor Apex Company	Univar USA, Inc.
Truex, Inc.	

Has your company demonstrated extraordinary environmental efforts this year?
If so, apply for an NBC Environmental Merit Award! Download an application form at www.narrabay.com.

Vincent J. Mesolella, *Chairman* • Laurie A. Horridge, *Executive Director*
One Service Road, Providence, RI 02905
401-461-8848 • www.narrabay.com

**TABLE 40
SUMMARY OF ENFORCEMENT ACTIONS
2009-2019**

Field's 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	STIPULATED PENALTIES ASSESSED	STIPULATED PENALTIES PAID	STIPULATED PENALTIES BALANCE
AO #FP-01-09 AO #FP-02-09 Mazey's Restaurants	10/8/2009	Settlement Superior Court Stipulation 10/24/13	\$18,500	\$640.00	\$640.00	\$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	\$8,000	\$0.00	\$0.00	\$0.00	\$0.00
AO #FP-01-17 Rain Car Wash	4/27/17	Letter of Agreement 05/03/18	\$4,000	\$4,000	\$4,000	\$0.00	\$0.00	\$0.00	\$0.00
AO #FP-01-18 DE Foods Inc. dba KFC	11/9/18	PAID	\$1,600	\$1,600	\$1,600	\$0.00	\$0.00	\$0.00	\$0.00
AO #FP-02-18 DiFruscia Industries, Inc.	12/27/18	Consent Order 09/03/19	\$18,850	\$13,195	\$7,697.06	\$5,497.94	\$0.00	\$0.00	\$0.00
AO #FP-01-19 Extreme Auto Recondition	12/26/19	PENDING	\$8,500	PENDING	\$0.00	\$8,500	\$0.00	\$0.00	\$0.00
AO #FP-02-19 Providence Specialty Products	12/26/19	PENDING	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

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	STIPULATED PENALTIES ASSESSED	STIPULATED PENALTIES PAID	STIPULATED PENALTIES BALANCE
AO #BP-01-09 Coastal Collision & Towing, Inc	07/22/09	Immediate Compliance Order	\$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	\$5,000	\$1,000	\$1,000.00	\$0.00	\$0.00	\$0.00	\$0.00
AO #BP-01-15 Ecological Fibers, Inc.	10/06/15	Consent Order 02/08/17	\$22,000	\$10,000	\$10,000	\$0.00	\$0.00	\$0.00	\$0.00
AO #BP-01-16 Memorial Hospital of Rhode Island	09/22/16	PAID	\$2,500	\$2,500	\$2,500	\$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, TAC, Laboratory and EM 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 TAC 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 EM Section routinely samples permitted NBC users, providing monitoring data necessary for the Pretreatment Section to evaluate user compliance with discharge limitations. EM and TAC conduct 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. EM 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 EM. This chapter details the projects, studies, and programs that the Pretreatment, TAC, EM and Laboratory Sections have worked on in 2019.

Status of Projects, Programs and Studies

Dental Amalgam Program

In 2005 the NBC implemented its Best Management Practices for the Management of Waste Dental Amalgam (BMP) program. The BMP gave dental facilities two options for handling wastewater potentially contaminated with amalgam. The first option required the installation of an amalgam separator that is ISO 11143 certified with a removal efficiency of 99%. The second option did not require the installation of a separator but did require the dental facility to monitor its waste streams potentially contaminated with amalgam and comply with stringent mercury limits. In addition, the BMP outlined additional requirements regarding the storage and disposal of amalgam, use of line cleaners and staff training, that are applicable to all dental facilities. To date all dental facilities in the NBC districts opted to install amalgam separators and have been permitted. Since the implementation of the BMP program, mercury influent loadings have been greatly reduced with Field's Point experiencing a 84.2% reduction and Bucklin Point experiencing a 76.1% reduction.



On July 14, 2017 the EPA Dental Point Source Category, 40CFR441, (Dental Amalgam Rule) became final. This rule applies to all dental facilities that place or remove amalgam on a regular basis and discharge to wastewater treatment facilities. These facilities are required to install amalgam separators that are ISO 11143 (or ANSI/ADA 108-2009) certified with a removal efficiency of 99% or an equivalent device. The NBC BMP is more stringent than the Dental Amalgam Rule since all facilities that place or remove amalgam are required to install these separators regardless of the frequency of placing or removing amalgam. The NBC BMP document was revised to remove the option to sample wastewater potentially contaminated with amalgam and not install the separator.

In addition to the requirement to install an amalgam separator, the Dental Amalgam Rule requires facilities conducting dental operations to complete a One-Time Compliance Report and submit it to the local Pretreatment Program. NBC Pretreatment staff developed a form to comply with this requirement. In 2018 the NBC form was sent to all permitted dental facilities, hospitals, assisted living facilities and universities/colleges. To date 100% of the facilities completed and submitted the form. In 2019 a survey of all unpermitted dental facilities was conducted. These facilities are not permitted because they do not place or remove amalgam and/or use wet chemistry to develop x-rays. Although, these facilities may not place or remove amalgam, the Dental Amalgam Rule requires that they complete and submit a One-Time Compliance Report. The NBC One-Time Compliance Report was sent to 49 facilities and to date 90% of them completed and submitted the form that they can comply with the federal rule. Pretreatment staff also

revised the Wastewater Discharge Permit Application for this classification of user to incorporate information from the One-Time Compliance Report. A copy of the NBC One-Time Compliance Report Form for Dental Facilities can be found in ATTACHMENT VOLUME I, SECTION 3.

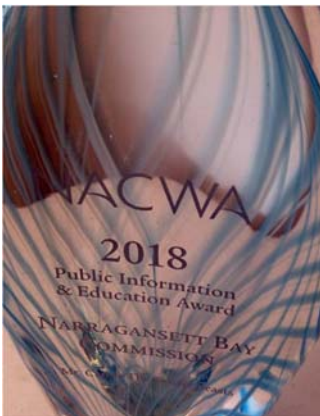
Throughout 2019 permitted dental facilities continued to comply with the terms of their permits and follow the BMP. Annual certification of compliance with the BMP program continue to be submitted in compliance with permit requirements.

Grease Control Program

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 or the in-ground passive grease interceptor. 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 NBC 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.

Pretreatment and Public Affairs staff have been working to develop a Residential Grease Control Program to educate the public on the impacts of fats, oils and grease on the sewer system and proper ways to handle and dispose of grease. In 2017 a mascot, Mr. Can, was created. Mr. Can is a super hero who guards the sewer system from the grease beasts. A story entitled “Mr. Can vs. The Grease Beasts” was created. In the story the grease beasts are wreaking havoc on pipes. Mr. Can freezes them and tells the viewer to “Cool It and Can It”, his slogan. A short video can be seen on YouTube. In 2018 the NBC continued to expand this campaign by incorporating Mr. Can vs. The Grease Beasts into the NBC Watershed Explorers Program.



Mr. Can freezes them and tells the viewer to “Cool It and Can It”, his slogan. A short video can be seen on YouTube. In 2018 the NBC continued to expand this campaign by incorporating Mr. Can vs. The Grease Beasts into the NBC Watershed Explorers Program. In addition, promotional materials, such as pins, posters and coloring books were printed. All of these materials are available in both English and Spanish. This program won Public Information & Education Award from the National Association of Clean Water Agencies.



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 2019, the NBC recognized numerous firms for their exemplary environmental activities performed in 2018. NBC recognized nineteen companies with Perfect Compliance Awards for achieving 100% compliance with all NBC regulatory requirements. The 2018 award recipients are as follows:

- ★ Dominion Energy Manchester Street, Inc.
- ★ Electrolizing, Inc.
- ★ Godfrey & Wing, Inc. d/b/a Impco
- ★ HP Services, Inc.
- ★ Interplex Engineered Products, Inc.
- ★ Maroon Group, LLC d/b/a Lincoln Fine Ingredients
- ★ Materion Technical Materials, Inc.
- ★ Metallurgical Solutions, Inc.
- ★ Narragansett Jewelry dba C&J Jewelry Co.
- ★ Pawtucket Power Associates
- ★ Providence Journal Co. – Production Facility
- ★ Providence Metallizing Company, Inc.
- ★ Tanury Industries PVD, Inc.
- ★ Technodic, Inc.
- ★ Teknicote, Inc.
- ★ Teknor Apex Co.
- ★ Tiffany and Company
- ★ Truex, Inc.
- ★ Univar USA, Inc.



In addition, one company, Ricci Family Dentistry, received an Environmental Merit Award for it's pollution prevention efforts.



Each award recipient received a plaque and had their company name and environmental accomplishments published in the Providence Journal. Applications for the 2019 NBC Environmental Merit Awards will be available on-line in late February 2020 and the presentation of these awards will take place in April 2020.

Pollution Prevention Activities

Throughout 2019 Pollution Prevention staff from the TAC Section 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 TAC 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.

TAC staff performs technical assistance site visits of NBC industrial users, organizes and conducts workshops and seminars, and produces educational fact-sheets. Technical Assistance staff conducted 5 individual site visits during 2019 on a variety of pollution prevention, energy efficiency, and environmental regulatory compliance improvement projects including:

- Food Production and Service Establishments
- Metal Finishing Facilities
- Textile Manufacturing Facilities

Technical Analysis & Compliance 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. To date, the NBC has secured grant funding totaling \$2,931,810 for pollution prevention and technical assistance activities. TABLE 41 summarizes the funding for projects awarded in 2019.

TABLE 41
Summary of 2019 Grant Awards

Program	Grant ID#	Project Period (CY)	Original Grant Award
National Grid Energy Efficiency	9675169	2019 (rec'd)	\$40,663
National Grid EV Infrastructure	89307-94011	2020 (anticipated)	\$16,930
National Grid EV Infrastructure	89292-36017	2020 (anticipated)	\$16,473
RI Office Of Energy Resources		2020 (anticipated)	\$27,415
Total			\$101,481

In addition to grant funded projects, TAC 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.

Renewable Energy and Energy Conservation Program

The NBC has been awarded numerous grants over the years to help develop and implement energy efficiency and management programs at NBC facilities.

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 conducts detailed energy audits of its various facilities and operations in order to identify energy conservation opportunities and continues 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 being used or developed include:

- Field's Point Wind Turbines
- Coventry Wind Turbines
- Kingston Solar 1 & 2
- Johnston Wind Turbine
- Bucklin Point Biogas Combined Heat and Power (anticipated to become operational in 2020)

Additional energy management related activities conducted in 2019 included:

- Served on NEWEA Energy Committees
- Conducted Energy Audits of NBC facilities
- Organized meetings to assess feasibility of participating in demand response
- Prepared Solar Carport Energy Feasibility Assessment
- Reviewed proposals, contracts, legislation and attended Public Meetings related to renewable energy
- Tracked and reported NBC sustainable energy production data
- Attended meetings on the Biogas Engine Project
- Secured grants and incentives for energy projects including for electric vehicle charging stations
- Conducted Energy Management Presentations/Tours of NBC facilities
- Secured, organized, hosted Energy Training for Field's Point Operators as part of USDOE's Better Plants Program (BPP)
- Hosted Educational Workshop and ISO 50001 Ready Training for participants in National Grid's Continuous Energy Improvement (CEI) Program
- Participated in CEI by attending meetings, completing Energy Audits at Fields Point and Bucklin Point WWTFs and using energy teams to track progress
- Participated in USDOE BPP and worked on developing a model of NBC facility energy use
- Prepared Fact Sheets and Summary Update on NBC renewable energy projects

Rhode Island Commerce Corporation awarded the NBC a grant of \$80,000 as part of the Renewable Energy Fund 2018 Commercial Scale Grant Program. Funds shall be used toward completing the anaerobic digestion project with a 644kW engine generator installation at Bucklin Point.

Osprey Camera

The Bucklin Point plant includes two closed landfills that run parallel to the Seekonk River. These closed landfills have been repurposed as wildlife refuges. Following guidelines established in the DEM Facilities Stewardship Plan for Wildlife, the land was revegetated and a large portion was allowed to grow wild. Three osprey platforms were installed, two on the north landfill and one on the south landfill to encourage the annual return of these birds.



Over the years, staff observed two birds returning to the platforms in the spring and typically four to five birds depart the nest at the end of each summer. In 2015 TAC staff began to research ways to monitor and record the nesting activities of the birds. In 2017, a 100W photovoltaic (PV) was installed to power a Pan, Tilt, Zoom camera. This camera allowed the observer to maneuver the camera and

remotely view the birds in their nest. The mating season, incubation, hatching and development of three offspring were documented. The feed could be accessed through www.narrabay.com. In 2019, a new system was designed which included a wireless access point and antennae to ensure a more reliable connection.

Sewer Connection Permit Program

The NBC reviews all 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 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. The Permit Section utilizes software that allows information to be entered and tracked and automatically process permits. In addition applications can be completed and submitted online and fees can be paid electronically. A workstation was installed in the ES&C office area for applicants to use to complete applications.

Throughout 2019 each sewer connection was plotted on the maps in the GIS system. By clicking on the project the viewer will be able to access relevant information such as the location, and type of connection.



In 2019 318 Sewer Connection Permit applications were processed, the majority of which were for residential connections. Pretreatment reviewed 20 of these 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

Permit staff regularly work with 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, additional stormflow has been eliminated from the Field's Point sewer system in 2019 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 well over 10 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.

Spill Prevention Control and Countermeasures and Storm Water Pollution Prevention Plans

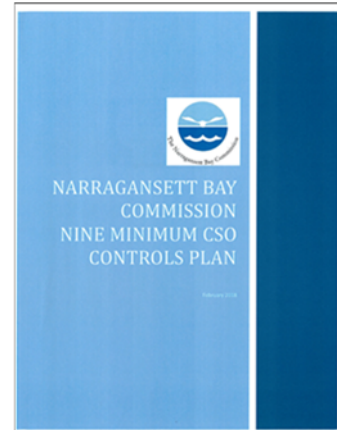
During 2010, the Field's Point facility was required by the EPA to develop a Spill Prevention Control and Countermeasures Plan (SPCC) in accordance with 40CFR112. The task to develop the SPCC was assigned to the ES&C Section. Staff reviewed the regulations to determine the best approach. This review 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 Multi Sector General Permit (MSGP) General Storm Water Permit issued by the DEM. These overlapping 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. ES&C 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. The MSGP issued in 2013 expired in August 2018. DEM revised the permit and put it out for public comments in January 2019.

The new MSGP became effective on May 3, 2019. The SWMP for each facility was revised to comply with the 2019 MSGP. A Notice of Intent (NOI) and revised SWMP were filed electronically for each facility with DEM on July 29, 2019. The SPCC/SWMP Operations Manual were revised to incorporate the 2019 MSGP and SWMP. The Field's Point manual now incorporates the entire Field's Point campus including the Ernest Street/CSO Tunnel Pump Station site.

Both the SPCC and SWMP require annual inspections of the facilities and training on the plans. ES&C staff conducted the inspections of Field's Point campus, and Bucklin Point in September 2019. The inspections of the storm water structures at both plants were conducted in June 2019. The annual training at both facilities was conducted in June and December of 2019. The 2018 Storm Water Annual Reports were submitted on February 15, 2019.

Nine Minimum Controls Compliance Program for CSOs

The RIPDES permits that became effective on December 1, 2017 required the NBC to update the Nine Minimum CSO Controls (NMC) Plan. The plan was submitted and approved by DEM in early 2018. The comprehensive NMC plan details the maintenance and monitoring programs that are in place to ensure the sewer and CSO systems are functioning properly. The standard operating procedures that are outlined in the plan help to maximize the collection system for storage and flow to the treatment plants. The plan also identifies structures that are in place to control solid and floatable materials in CSOs. The NMC Plan was submitted to DEM and approved in early 2018.



Throughout 2019 the Pretreatment, TAC and EM 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 Technical Assistance staff 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 NBC Technical Assistance 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 EM. EM 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, EM collects samples twice per week for fecal coliform from the Woonasquatucket, Providence, West, Blackstone, Seekonk, and Moshassuck rivers. Enterococcus bacteria is routinely conducted at some of the monitoring stations to evaluate primary contact uses. This bacteria is evaluated by regulators and provides a more direct correlation of the impact on the receiving waters by NBC. 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 (IM) staff to ensure they are properly functioning. EM 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. EM 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 Technical Assistance Programs and the effectiveness of the NBC Nine Minimum Controls Program. The monitoring also provides data to gauge the success of the CSO Program. In addition, 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 2019 EM staff collected samples at CSOs located in both the Field's Point and Bucklin Point districts 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 2019 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.



The RIPDES permits that became effective on December 1, 2017 required the Pretreatment Program to establish BMPs for permitted facilities to control the discharge of litter from their property. In addition, Pretreatment staff was required to verify compliance with the BMP. The NBC contested these requirements as litter is defined as trash that is left lying in open or public spaces not a process wastewater. Therefore, litter does not fall under the purview of the Pretreatment Program outlined in 40CFR403. Throughout 2018 the NBC and DEM negotiated various requirements outlined in the RIPDES permits including the litter requirement. It was agreed the Pretreatment Program would educate Significant Industrial Users (SIU) on the impacts of litter on the combined sewer system during annual inspections. Revised language for the RIPDES permits is outlined in Attachment A of Consent Agreement RIA-424 signed on September 5, 2018. To comply with the revised requirement, the SIU Annual Report Checklist has been revised to prompt the inspector to educate the user during the inspection.

River Restoration Grants Program

In response to the chronic pollution visible on the Woonasquatucket River in downtown Providence, Narragansett Bay Commission Chairman, Vincent Mesoella 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 River 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 2012 the NBC implemented an Earth Day Grant program. This program awards grants to local organizations, cities and towns to impact more green spaces and multiple water ways throughout the NBC districts.

In 2019 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 organizations, cities and towns by providing 22 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 2019 grant recipients are listed below:

Blackstone Heritage Corridor
Blackstone River Watershed Council/Friends of the Blackstone
Boys and Girls Club of East Providence
BVTC/ Keep Blackstone Valley Beautiful
City of Central Falls
City of East Providence, Department of Public Works
Cumberland Land Trust
East Providence Conservation Commission
East Providence Police Explorer Program
Edgewood Waterfront Preservation Association
Neighborhood Alliance of Pawtucket
Neutaconkanut Hill Conservancy, Inc.
Partnership for Providence Parks
Save the Bay
Town of Lincoln
Town of Smithfield
Voice of the Forest Alliance
Water Fire 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.

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. In 2019 EM worked with Pretreatment staff and collected samples from Pleasant Valley Brook and storm lines associated with Pleasant Valley Brook in Providence to identify the source of elevated bacteria counts observed at Outfall 045 on the Woonasquatucket River. It is believed that the source of the bacteria may be from a sanitary connection to a City of Providence-owned storm line that ultimately discharges to the Pleasant Valley Parkway Brook. The findings from the investigation have been provided to Providence DPW and the RI DEM for further investigation.

Regional Ocean Modeling System – ROMS

Since 2004, NBC has funded joint work with the physical oceanography lab led by Dr. Chris Kincaid of the University of Rhode Island Graduate School of Oceanography on circulation and hydrodynamic modeling for 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-based 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 ROMS model 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 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.

An updated model, Seekonk River-Narragansett Bay (SNB)-ROMS was completed to enhance grid resolution, incorporate an accurate representation of the Seekonk River coastline and bathymetry, and to support 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.

During 2018 a temporary site was established in the Seekonk River near the East Providence Yacht Club to better understand this flow-constricted area and to further the development of the ROMS model. Sondes were deployed at this site from June – November 2018 and from June – September 2019. An additional temporary site was established near Bullock’s Reach to investigate changes in salinity, temperature, and oxygen along an area with steep bathymetry to better improve model predictions. Sondes were deployed at this location from September to November 2019.

In 2019, the NBC Board of Commissioners Approved Amendment 5 to the “NBC ROMS Hydrodynamic Water Quality Model of Narragansett Bay” Agreement. The next phase of this project includes increases in Upper Narragansett Bay grid resolution to better simulate nutrient movement and algal bloom dynamics under different wastewater treatment plant nutrient removal scenarios and to run a series of simulations for eight different locations/diffuser options for the Bucklin Point diffuser pipe. ES&C staff have updated ROMS public outreach documents, including presentations and fact sheets. The NBC continued to support data collection efforts for this model, which include the deployment of water quality monitoring sondes and tilt current meters. For a detailed history and updates on this project visit:

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

Laboratory Information Management System (LIMS)

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 treatment facilities make operational decisions rapidly. All laboratory instruments are interfaced with the LIMS, which allows for a faster way of entering lab results into the software.

In 2018 the new Thermofisher LIMS, Sample Manager, was put online. In 2019 EM sought to increase functionality for a wider variety of users. Automatic authorization of field parameters was tested and implemented to facilitate data review and migration into downstream reports. Sample workflows focused on flexibility by incorporating prompts which allows the user to determine a wider variety of sample login options. Going forward, feedback from field staff and lab personnel is continuously used to inform sample login processes. The LIMS Data Coordinator is responsible for tracking sample and workflow changes and writing work instructions for frequently executed LIMS tasks. In addition, the LIMS was interfaced and programmed to work with the new robotic auto-titration system in the laboratory. This interface will allow data to be sent automatically to LIMs from the auto-titration system, eliminating the potential for typographically errors. Additional LIMS training and optimization will continue throughout 2020.

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. During 2019 staff continued to upload data to the system for its internal users. EM staff run reports each month to complete the Discharge Monitoring Report (DMR) from this system. The LIMS Data Coordinator is responsible to ensure data is properly entered in the system.



In 2011, ES&C 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. During 2019 staff continued to upload monitoring data to the webpage for public access and use.

Phytoplankton Monitoring

During 2019, the NBC continued to collect Bay samples for phytoplankton analysis once to twice each month, to better understand the complex dynamics of the Bay ecosystem and how it is impacted by nitrogen reductions by the NBC and other inputs.

Phytoplankton samples were collected from the surface at the Bullock Reach water quality station every month of 2019 except February, May, September, and December due to unsuitable weather or resource availability. The Bullock Reach station was selected as the plankton monitoring location because it is the site of one of the NBC fixed-site water quality monitoring stations. With chlorophyll concentrations constantly monitored at the site during the spring, summer, and fall seasons, the NBC can collect routine planned samples, and also collect additional samples when fixed-site chlorophyll data indicate a phytoplankton bloom is present. Results are posted in a blog format on the NBC website www.snapshot.narrabay.com.

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. The plankton net captures the plankton floating near the surface and concentrates them in a sample bottle. The second 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. From the whole water sample, a specific volume of water (1 mL) is examined under the microscope to determine the abundance of each phytoplankton taxon 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 has aligned methods with the University of Rhode Island – Graduate School of Oceanography (URI-GSO), which collects similar phytoplankton data in the lower Bay. Through this collaboration, comparisons can be made between the phytoplankton in these two Bay regions.



Benthos Monitoring

During 2019, EM 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 has only been in place since 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 unsuitable weather conditions on several occasions. Discussions of results and observations made during these video surveys are currently being posted to the www.snapshot.narrabay.com in an effort to share these findings with the public. In addition, the NBC has spearheaded a collaboration among members of the Nature Conservancy, the RIDEM, EPA, and other researchers to align benthic research methods for active projects in the Bay. These efforts will maximize the utility of the data collected by each group to complement the other projects, promoting a broad understanding of the benthic conditions.



On Going Projects

Over the years the ES&C 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 2020.

***VIII. NBC PRETREATMENT PROGRAM
GOALS***

Status of 2019 Goals

This chapter outlines the progress made during 2019 toward meeting the goals established in the 2018 Pretreatment Annual Report and defines goals for 2020.

- **2019 Goal:** Publish Pretreatment Program Annual Report

Accomplishment: The 2018 Pretreatment Program Annual Report was completed and submitted to the DEM on March 14, 2019 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 2018 Pretreatment Annual Report was uploaded to the internet on March 15, 2019.

- **2019 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 were inspected two or more times during 2019. The EM Section performed well toward satisfying the NBC goal to sample each SIU at least twice. However, three SIUs were not sampled twice during 2019. Two SIUs, Orbit Energy Rhode Island, LLC and Tanury Industries PVD, Inc. were unable to be sampled as they did not discharge in 2019. Orbit Energy Rhode Island, LLC is a SIU that will be conducting food waste to energy operations. The company began upgrading the process operations and pretreatment system prior to beginning discharges. The upgrades were not completed in 2019 and therefore sampling could not be conducted in 2019. This was verified during the inspections of the facility conducted during 2019. Process discharges are set to begin in 2020. EM was unable to collect samples as process wastewater was not generated in 2019. The other SIU unable to be sampled, Tanury Industries PVD, Inc. conducts physical vapor deposition operations. The company collects all process wastewater and discharges on a batch basis. The company is required to sample its wastewater and request permission prior to discharge. EM 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. Since there was no sewer discharges in 2019 samples could not be collected. The third SIU not sampled twice in 2019, Monarch Metal Finishing Company-Aurora Street, was sampled only once. EM sampled the company on March 11, 2019. The company experienced a small fire in the facility on March 24, 2019. The company was prohibited from re-opening in 2019. Therefore, EM was unable to collect another sample. 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.

- **2019 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 2019, the Pretreatment staff conducted 1,834 inspections of commercial and industrial users. Pretreatment staff performed thorough inspections of 98.9% of permitted non-significant industrial users, performing 384 inspections of this classification of user. During 2019, Pretreatment staff inspected 50.3% of the permitted restaurants and commercial buildings with cafeterias, conducting 574 inspections of facilities in these two categories. Pretreatment staff inspected 58.8% of all other commercial users, meeting the self-imposed goal. There were 273 inspections conducted of commercial users during 2019. Additional information regarding the NBC inspection program is provided in CHAPTER III.

- **2019 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 2019, as 439 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 2019, as 141 of the 439 permits were issued to new users. The majority of the new permits were issued to non-significant industrial and commercial users.

The Pretreatment Section routinely performs expeditious reviews of discharge and sewer connection permit applications and work closely to ensure that contractors and users needs are promptly addressed. During 2019 the Pretreatment Section performed expeditious reviews of 180 process and pretreatment system plan submittals. Of these 180 plan submittals 105 were promptly approved, 29 were approved with conditions to be met, 17 were rejected since NBC requirements were not satisfied and no action was taken initially on 29 plans since additional information was required for approval.

The Permits Section issued Sewer Connection Permits within ten business days. During 2019, 313 Sewer Connection Permits were issued. Additional information regarding this program is provided in CHAPTER VII.

- **2019 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 2019, 42 of the 63 or 66.7% of the industrial areas and mill complexes were inspected at least once. 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 2019.

- **2019 Goal:** Re-evaluate Local Discharge Limitations at both treatment plants per new RIPDES permit requirements.

Accomplishment: Throughout 2019 Pretreatment, EM and TAC staff worked together to reevaluate the local limits for both treatment plants. The modeling was not completed until late 2019. The initial re-evaluation reports were submitted to DEM on May 15, 2019. DEM reviewed the reports and in November requested additional information including the results of the modeling of the Field's Point plant and projected flows and loads from phase III of the CSO Abatement Project on the Bucklin Point plant. The Field's Point modeling was completed in late 2019 and a review of projected flows and loads to Bucklin Point confirmed existing design capacities are accurate. The Local Limits Evaluation Reports containing the additional information were submitted to DEM on January 17, 2020.

- **2019 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 2019, Pretreatment staff conducted 25 investigations. To assist NBC staff in conducting these investigations, Spill Response and Tracking training is provided annually.

Pretreatment and EM 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, EM 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, EM 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.

- **2019 Goal:** Continue regulatory inspections of Septage Haulers as part of the NBC Septage Discharge Control Program.

Accomplishment: During 2019, Pretreatment staff reviews information reported on Residential Septage Manifest Forms. If any discrepancies are noted, the customers listed on the manifest are contacted by phone or mail. In addition, Pretreatment staff conducted 10 inspections at the Septage Receiving Station during 2019. Additional information regarding the NBC Septage Discharge Control Program is provided in CHAPTER VII.

- **2019 Goal:** Improve Data Management.

Accomplishment: During 2019, Permits staff continued to use a database to track 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. The locations of the connections are plotted on GIS. Throughout 2019, Permits staff continued to use an online application process which allows sewer connection permit applications to be completed, submitted and paid for online.

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 2019 EM 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. During 2019 EM worked with the NBC IT Section to make improvements to the snapshot webpage. There were improvements to the fixed site dashboard layout as well as functionality enhancements to the data export page.

Throughout 2019 IT staff continued to work on optimizing the Pretreatment software to increase functionality. Staff can now better track submittals of Certifications of No Discharge and Dental BMP Certifications, and issue the appropriate Notices of Violation if these certifications are not submitted. Staff can access mapping applications from the Pretreatment System. In addition the software is available in the field via iPads. Pretreatment and IT staff will continue to work on additional enhancements throughout 2020.

In 2018 the Pretreatment Section requested and received approval for minor modifications to the Industrial Pretreatment Program from DEM. The minor modification allows the acceptance of electronic signatures on permit applications. Throughout 2019 Pretreatment and IT staff have been working on the development of a webpage where facilities can complete Wastewater

Discharge Permit Applications and upload supporting documents such as process operations and pretreatment system plans. This webpage should be complete and available to the public in 2020.

Throughout 2019, ES&C 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 2019 Pretreatment staff continued to use inspection checklists in the field and were given functionality to access the Pretreatment System in the field.

In 2018 a new LIMS, SampleManager, was put online. This LIMS provides greater functionality. These improvements include a more streamlined application, greater sample management, and documentation of chemical purchases and use. All analytical instruments have been interfaced with the new LIMS. Instruments purchased in 2019 were interfaced with LIMS when put online. In addition it has been interfaced with data management software which is utilized by the treatment plants and Pretreatment System. EM staff can now directly interact with LIMS when collecting samples.

Throughout 2019, EM staff continued to document sample collection activities and coordinate these sample collections with the Laboratory for efficient analyses and data reporting. ES&C staff performed quality control functions to ensure all data is complete and accurate. In addition, software has been put online to improve data handling.

- **2019 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, EM and Laboratory 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 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 2019 NBC staff participated in OSHA classroom and hands-on sessions and had access to NBC University on-line safety training programs.

- **2019 Goal:** Continue to document Pretreatment, EM 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, EM 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 2019, Pretreatment staff continued to review SOPs and update them accordingly.

During 2019, EM 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 EM SOP manual. During 2019, SOPs were either updated or developed for Field's Point and Bucklin Point. Acid Cleaning Procedures and Schedule Procedure to Request Entero Dilutions at both treatment plants, Procedures for Pre-Preserving Cyanide Carousels, Handling and Submitting of Chemical Delivery Samples, Field's Point RAS grab procedures, and new pH pen calibration procedures.

In 2019, the Laboratory SOP manual and QA/QC programs were updated. All new techniques and EPA methods were incorporated into the laboratory control documents.

During 2019, 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.

- **2019 Goal:** Provide free technical assistance.

Accomplishment: Throughout 2019 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 2019, technical assistance was provided to six facilities.

- **2019 Goal:** Water Conservation and Reuse.

Accomplishment: TAC staff continued to investigate opportunities for the reuse of treated wastewater from the two treatment plants. Throughout 2019 staff continued to research U.S. water reuse regulations and requirements, met with representatives from DEM to discuss on-site water reuse opportunities. A second irrigation system using recycled plant water was installed in 2019.

- **2019 Goal:** Environmental Merit Awards Program - Solicit nominations from companies and staff, evaluate all Significant Industrial User performance data, and hold Awards Ceremony.

Accomplishment: In 2019, the NBC recognized nineteen SIUs for achieving 100% compliance with all NBC regulatory requirements. In addition one company received an Environmental Merit award for its pollution prevention efforts. The awards were presented to the organizations at a breakfast meeting held on April 17, 2019. Additional information regarding this program is provided in CHAPTER VII.

- **2019 Goal:** Workshops – Participate in workshops and conferences to educate the public on NBC programs and initiatives.

Accomplishment: During 2019, ES&C staff made numerous presentations at workshops, meetings and/or conferences. These conferences include New England Regional Pretreatment Coordinators Association Conference and Water Environmental Foundation Webinars. Further discussions on the workshops and other NBC educational efforts can be found in CHAPTER II.

- **2019 Goal:** Energy Management - continue to investigate energy conservation and alternative energy opportunities. Monitor, measure and report NBC renewable energy generation and seek grant funding for energy projects.

Accomplishment: In 2019 NBC joined the National Grid Continuous Energy Improvement (CEI) program which aims to improve energy efficiency by collaborating with other similar industries. Throughout 2019 TAC staff continued to track process measurements and energy use measurements from various NBC metered accounts and buildings and assessed performance data using EPA Energy Star Portfolio Manager, CEI and the USDOE Better Plants Program. During 2019, some major accounts reduced normalized energy use compared to the base year. Results have begun to be tracked with related actions in the CEI Energy Management System. They will be compared to site specific energy models to determine progress and the corresponding amount of rebate payment NBC may receive from the program.

The amount of sustainable energy and credits produced for NBC facilities were monitored to measure the progress towards net zero sustainable energy use. The output of three 1.5 MW wind turbines located at the Field's Point plant and three 1.5 MW wind turbines located in Coventry, RI were monitored as was the output from solar arrays located in Richmond and the 3 MW wind turbine in Johnston, RI. During 2019 construction and testing of a Combined Heat and Power (CHP) system located at Bucklin Point continued. The CHP system will utilize biogas to generate renewable electricity and useful heat. TAC staff continued to research NBC power demand and opportunities for demand management and demand response. Grant funds were secured to cover the entire cost of purchasing and installing one electric vehicle charging station at each of its wastewater treatment facilities. TAC staff continues to actively research grant opportunities through various programs including the National Grid Energy Efficiency rebate program.

2019 Goal: Assess NBC Greenhouse Gas (GHG) Emissions – research regulations and guidance documents, refine GHG inventory and assess process emissions.

Accomplishment: Throughout 2019, NBC continued to collect and analyze electrical, natural gas, biogas and vehicle fuel information to support operations as well as quantify and inventory GHG emissions for Field’s Point and Bucklin Point. During 2018, staff devised an analytical approach to estimating carbon emissions from the Fields Point Biological Nutrient Removal process that were previously measured by URI. During 2019 staff continued preparing an improved carbon balance over the anaerobic digestion process at Bucklin as a check on the biogas production rate. TAC staff continued to research regulations on the eligibility of sewer sludge as an eligible energy source. NBC site specific and overall GHG emissions remain below current reporting requirements for both the State of Rhode Island and the EPA. Staff participated in public meetings of the Executive Climate Change Coordinating Council (EC4) and Heat Sector Transformation Stakeholder Group.

- **2019 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: EM staff conducted weekly manhole monitoring throughout both NBC drainage districts. This monitoring program consists of installing automatic ISCO samplers in surveillance manholes located upstream and downstream of users on a weekly basis to verify users' compliance status. EM staff successfully sampled 240 industrial surveillance manholes during 2019, 117 in the Bucklin Point district and 172 in the Field's Point district. In addition to the 240 industrial manholes, EM collected samples from 36 sanitary manholes. EM also attempted to collect samples from 13 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 2019, 289 manholes were sampled. This is a decrease of 11.1% or 36 manholes, when compared to the 325 manholes sampled in 2018. During 2019 surveillance manhole monitoring was conducted up and down stream of 72.1% of the SIUs which is a decrease from 2019.

- **2019 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 2019 to graphically depict results of drainage district sampling results in order to make interpretation of the data easier.

EM 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 36 sampling events of residential manholes were conducted during 2019.

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 2018 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 sometime in 2020.

- **2019 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: EM staff used clean sampling techniques for all industrial monitoring and treatment plant sampling for metals, cyanide and nutrients conducted in 2019. Throughout 2019, EM staff continued to use QA/QC sample collection practices to ensure the highest quality samples were being collected. During 2019, 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. EM staff continued to sample all process operations at both plants to acquire the data needed to optimize plant performance. During 2019, three new ISCO 5800 4 bottle samplers were installed at the Primary Treatment effluent locations 1 and 2 at Bucklin Point. A new ISCO 5800 sampler was also installed at the Mixed Liquor location.



- **2019 Goal:** To review, evaluate and log all analytical data obtained from EM 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 2019, EM and TAC staff 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 2019, ES&C staff published the Annual Data report summarizing all data collected from the 2018 monitoring season. During 2019, EM continued to work closely with the Laboratory staff regarding LIMS issues, as well as with IT staff to review existing databases to identify areas of improvement. During 2019, EM continued to maintain 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.

EM and TAC staff analyzes the data on a regular basis to establish trends and notify Operations, Interceptor Maintenance and/or Pretreatment staff of any anomalies. ES&C staff conducts monthly meetings to report the data trends. Pretreatment, Laboratory and Operations staff from both facilities routinely attend these meetings. During 2019, 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 2019, Pretreatment staff continued to work with IT staff on the PT-LIMS interface to download data directly from LIMS to the Pretreatment System.

- **2019 Goal:** Monitor the receiving waters of both the Field's Point and Bucklin Point treatment facilities with the fixed site monitoring equipment.

Accomplishment: In 2019, 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. Also, during 2019, the temporary site established in the Seekonk River near the East Providence Yacht Club was once again monitored during the first half of the monitoring season to better understand this flow constricted area and to further the development of the Regional Ocean System (ROMS) model. The temporary site was moved to a location near the Bullock's Reach buoy for the second half of the season to gather data to further refine the ROMS model in this area. In addition, weekly samples at these and other upper bay stations were collected for fecal coliform, nutrient analyses, chlorophyll-a and turbidity. EM 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.



- **2019 Goal:** Conduct tributary river sampling for fecal coliform analysis.

Accomplishment: In 2019 EM continued to sample 21 locations along six rivers in the metropolitan area, the Woonasquatucket, Providence, West, Blackstone and Moshassuck rivers. Weekly sampling of these 21 sites has allowed EM to promptly notify the Interceptor Maintenance (IM) Section of dry and wet weather discharges based on the analytical results and has been instrumental in pinpointing overflows and system malfunctions. The results of tributary river monitoring for fecal coliform bacteria is provided to IM twice per week and is used to locate possible maintenance problems. 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. NBC Environmental Scientists also analyze the data to determine trends in fecal coliform bacteria inputs to these rivers. Trend analyses are conducted and reported to NBC on a monthly basis. 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 Abatement Project, and data collected throughout 2019 in conjunction with data collected in future years will be used to evaluate the success of the NBC CSO projects in reducing adverse impacts to area rivers and Narragansett Bay.

- **2019 Goal:** Continue to evaluate the effect of the NBC effluent on water quality of the receiving waters.

Accomplishment: During 2019 EM and TAC staff 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. EM 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 EM 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 2019. In addition, during 2019, EM 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.



- **2019 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, EM 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. Sampling of two CSOs planned for 2019, including the North Diversion Structure at Bucklin Point, was completed. A CSO event in the Field's Point district was sampled on December 30, 2019 at Outfall #023 at Pitman Street in Providence. A discharge from the North Diversion Structure was sampled on July 23, 2019.

- **2019 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 2019. 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.

- **2019 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 EM 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, EM 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. EM 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 2019. Data collected from these locations is used to evaluate the tunnel's success in reducing adverse impacts to area tributary rivers.

- **2019 Goal:** Continually improve NBC monitoring and analytical capabilities.

Accomplishment: In 2007, EM began replacing antiquated refrigerated automatic samplers located within 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 2019, three new ISCO 5800 4-bottle samplers were installed at the primary treatment effluent locations 1 and 2 at Bucklin Point and at the mixed liquor location.

In 2019 additional Laboratory staff was trained on LIMS. New LIMS analysis codes were developed. The codes are part of the set up procedure that allows analytical results to be directed into LIMS. The laboratory continued to improve test methods and instrument confidence with the use of high quality laboratory equipment. In addition, new tools were put online to improve data handling.

- **2019 Goal:** Participate in community based environmental and educational projects.

Accomplishment. In 2019 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 22 small grants to 20 organizations totaling \$11,100 that allowed the organizations to purchase supplies to organize clean up events and river restorations activities in the NBC service district.



During 2019, ES&C staff participated in the NBC Watershed Explorers Program, reaching over 800 school students.

- **2019 Goal:** Conduct studies during extreme weather or emergency events.

Accomplishment: In 2007, as part of its monitoring plan EM 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. Beginning in late September and continuing through December 2019, extra sampling was conducted at Field's Point in an effort to determine the cause of elevated effluent cyanide results. Samples were collected of the sodium bisulfite, polymer, sodium hypochlorite, gravity thickener supernatant, centrate, plant deodorizer, and a nearby rock salt storage supply to determine if they were potential sources of the cyanide. Samples were also collected from the effluent prior to chlorination and two major industrial manholes downstream of SIUs with the potential to discharge cyanide. Samples were collected from the Synagro centrate manhole twice weekly to assess if extra loads were being processed after weekends, and final effluent grab samples were collected weekly, preserved, and analyzed for total cyanide for 3 consecutive days, and unpreserved and for 4 different preservative amounts to determine if any cyanide interferences were caused by the sodium hydroxide preservative or sample hold times. During months with available cyanide results above the permit limit, additional samples from the influent and effluent composite carousel were submitted to the lab for analysis. The data failed to indicate the source of the cyanide. Elevated effluent cyanide levels have since returned to normal. In August 2019, the NBC was notified by an environmental group that sewage was discharging to the Woonasquatucket River via a NBC owned outfall on Promenade Street in Providence. ES&C staff investigated the structures in the vicinity of the outfall. These structures include, sewer lines, storm lines and structures associated with the CSO tunnel. Samples were collected on storm lines contributing to this outfall including the Pleasant Valley Brook. The samples were analyzed for fecal coliform. The results showed fecal coliform was present in manholes on Garfield Avenue. This storm line is owned by the City of Providence.

- **2019 Goal:** Ensure compliance of monitoring processes at the two treatment plants.

Accomplishment: During 2019 EM supervisory staff continued to review closed circuit television monitoring footage from equipment installed at all influent and effluent monitoring stations of both treatment plants in 2017 in order to ensure proper sample collection and maintenance procedures are followed. The recorded footage will continue to be reviewed to ensure consistency with established SOPs.

- **2019 Goal:** Provide access to all NBC monitoring data.

Accomplishment: EM staff analyzes the data on a regular basis to establish trends and notify Operations, Interceptor Maintenance and/or Pretreatment staff of any anomalies. EM staff conducts monthly meetings to report the data trends. Pretreatment, Laboratory, TAC and Operations staff from both facilities routinely attend these meetings. EM completed and posted its annual data report to www.narrabay.com during 2019. 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.

- **2019 Goal:** Implement flow monitoring of rivers not presently on the USGS Streams Gauge Network.

Accomplishment: In past years, EM staff conducted flow monitoring activities on various tributary rivers. A Global Flow probe model FP101 is used to acquire velocity measurements for approximately 10 cross-sectional segments. The depth is also recorded at each segment. Using the data gathered, flow is calculated in cubic feet per second, which can then be converted to gallons or hundreds of gallons per minute. These flow measurements allow NBC to calculate loadings using analytical data. On June 12, 2019 EM staff conducted flow monitoring activities on the Moshassuck River at Mill Street in Providence. The depth was also recorded at each segment. Using the data, flow was calculated to be 65.35 ft/sec. Flow measurements allow NBC to calculate loadings using analytical data. Flow monitoring is planned for early spring of 2020.

- **2019 Goal:** Participate in a study to evaluate emerging pollutants in the NBC receiving waters.

Accomplishment: In November 2017, NBC provided a letter commitment to work with a University of Rhode Island professor conducting research on emerging pollutants in particular PFAS, in support of a Narragansett Bay Estuary Program grant proposal. The NBC agreed to assist with the deployment and recovery of sampling devices along established NBC sampling routes and at the effluent at the two treatment plants. On June 4, 2018 EM staff deployed passive sampling devices at the effluent of the plants. The devices were recovered on July 3, 2018. The NBC awaits the findings of this sampling. There were no sampler deployments in 2019. EM staff will participate in any future deployments.

- **2019 Goal:** Ensure monitoring processes are in compliance with standard operating procedures at the treatment plants.

Accomplishment: During 2019 EM staff continued to review closed circuit television monitoring footage from equipment installed at the influent and effluent monitoring stations of both treatment plants in 2017 in order to ensure proper sample collection and maintenance procedures are followed. The recorded footage will continue to be reviewed to ensure consistency with established standard operating procedures..

Major Program Goals for 2020

Goal Category	Goal Outline	Goal Description
Inspections	Inspect industries to ensure compliance with regulations.	<ul style="list-style-type: none"> ▪ Inspect each SIU twice (EPA/DEM 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.	<ul style="list-style-type: none"> ▪ Conduct unannounced inspections of 75% of the mill complexes/industrial areas
	Continue regulatory inspections of septage haulers.	<ul style="list-style-type: none"> ▪ Inspect septage vehicles at the receiving station one day per month
Emergency Response Actions	Ensure protection of the two POTWs and Narragansett Bay to minimize incidents of pass through and interference.	<ul style="list-style-type: none"> ▪ 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.	<ul style="list-style-type: none"> ▪ Reply to all requests from users 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.	<ul style="list-style-type: none"> ▪ 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.	<ul style="list-style-type: none"> ▪ Conduct routine residential manhole monitoring ▪ Continue monitoring of residential sources of pollutants to better define background loading ▪ Conduct a potable water study to identify and quantify pollutant loadings
	Conduct surveillance monitoring in the sewer system to ensure compliance with regulations.	<ul style="list-style-type: none"> ▪ 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.	<ul style="list-style-type: none"> ▪ 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
	Update Local Discharge Limitations at both treatment plants per new RIPDES permit requirements upon DEM approval..	<ul style="list-style-type: none"> ▪ Address DEM comments on proposed Local Limits Evaluation (LLE) ▪ Conduct public hearing on local limits once approved by DEM ▪ Recategorize permitted users in accordance with the approved LLEs ▪ Update all permits with approved local limits

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	<ul style="list-style-type: none"> ▪ 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, turbidity 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.	<ul style="list-style-type: none"> ▪ 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 bacteria analysis to ensure compliance with EPA Nine Minimum CSO Control Program	<ul style="list-style-type: none"> ▪ 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 flush, mid-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
	Conduct Border river sampling for nutrient analysis to determine loadings to Upper Narragansett Bay that originate from outside of Rhode Island	<ul style="list-style-type: none"> ▪ 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
	Evaluate the success of the NBC CSO Abatement Program	<ul style="list-style-type: none"> ▪ 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. ▪ Prepare an evaluation of the impacts of Phase II on receiving water quality. ▪ Collect and analyze pre and post construction of Phase III to evaluate the impact of the receiving water
	Conduct periodic monitoring of storm sewer discharges	<ul style="list-style-type: none"> ▪ Conduct monitoring of at least two storm sewer discharges annually, one from each sewer district
	Conduct a site specific study mimicking the Mocoironorganics study done in the early 2000's to demonstrate water quality improvements in the upper bay.	<ul style="list-style-type: none"> ▪ Collect and analyzewater qualitysamples collected while performing four transects over each of the four seasons. ▪ All samples are to be analyzedfor ultra low metal levels.

Goal Category	Goal Outline	Goal Description
Monitoring and Analytical Initiatives (continued)	Continually improve NBC monitoring and analytical capabilities	<ul style="list-style-type: none"> ▪ Upgrade existing plant samplers as needed to improve monitoring capabilities ▪ Automate temperature monitoring at all automatic samplers ▪ Evaluate flow monitoring data for 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	<ul style="list-style-type: none"> ▪ Respond to all incomplete discharge permit applications and renewals within fourteen business days ▪ Review submitted Pretreatment facility plans on a weekly basis ▪ Develop and implement a webpage where permit applications can be submitted electronically.
Data Logging Analysis and Reporting	Continue to expand and improve electronic data systems	<ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> ▪ 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
	Evaluate the feasibility of electronic submittals of required information from industrial and commercial users.	<ul style="list-style-type: none"> ▪ Develop a webpage for the submittal of electronically signed permit applications ▪ Convert existing permit applications to be used on webpage ▪ Develop a portal where permitted users can upload PDF versions of monitoring and pH reports ▪ Pursue becoming CROMERR compliant

Goal Category	Goal Outline	Goal Description
Special Studies and Projects	Improve functionality of NBC computer systems	<ul style="list-style-type: none"> ▪ 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 ▪ Continue to improve the new LIMS software
	Energy Management	<ul style="list-style-type: none"> ▪ Continue to investigate Energy Conservation and alternative energy opportunities ▪ Monitor, measure and report NBC renewable energy generation ▪ Work with IT to develop Energy Tracking software ▪ Continue to participate in US Department of Energy Better Plant Program ▪ Continue to oversee NBC renewable energy ▪ Seek grant funding for energy projects
	Water Conservation and Reuse Projects	<ul style="list-style-type: none"> ▪ Continue to investigate WWTF reuse of wastewater and biosolids ▪ Conduct testing of treatment technologies ▪ Seek grant funds to support water conservation and reuse programs
	Evaluate environmental sustainability opportunities at NBC	<ul style="list-style-type: none"> ▪ Coordinate research to increase bio-gas production at Bucklin Point ▪ Evaluate use of incorporating electric vehicles into the NBC fleet
	Participate in community based environmental and educational projects	<ul style="list-style-type: none"> ▪ Continue Earth Day Grant Program ▪ Participate in the NBC Watershed Explorer Program ▪ Participate in statewide environmental stakeholder groups, such as Watershed Counts, RI Monitoring Collaborative, etc. ▪ Continue to provide video of Osprey nests at Bucklin Point
	Assess NBC Greenhouse Gas Emissions (GHG)	<ul style="list-style-type: none"> ▪ 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 ▪ Evaluate conversion of NBC fleet to electric vehicles
	Storm Water Management Plans	<ul style="list-style-type: none"> ▪ 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
	Bioassay Testing	<ul style="list-style-type: none"> ▪ Develop Bioassay testing ▪ Begin process to obtain EPA and EPA licenses and certifications ▪ Compare NBC results with control lab reports ▪ Conduct all Bioassay testing in house by 2022

Special Studies and Projects (cont'd)	PFAS Evaluation	<ul style="list-style-type: none"> ▪ Collect and analyze samples from SIUs to determine potential sources of PFAS ▪ Analyze samples of sludge to determine concentrations of PFAS ▪ Evaluate data to determine the impact on the plants and receiving waters
Internal Procedures	Document all Standard Operating Procedures and Protocols	<ul style="list-style-type: none"> ▪ Continue to detail all Pretreatment, EM, TAC 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	<ul style="list-style-type: none"> ▪ Prepare and submit the Annual Pretreatment Report to DEM by March 15th ▪ Upload the Annual Report to the internet by April 15th
	Environmental Merit Awards Program	<ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> ▪ 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
	Provide training programs necessary to ensure employee Health and Safety.	<ul style="list-style-type: none"> ▪ Provide all new applicable NBC 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	<ul style="list-style-type: none"> ▪ 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

