

AUTHORIZATION TO DISCHARGE UNDER THE
RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of Chapter 46-12 of the Rhode Island General Laws, as amended,

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

is authorized to discharge from a facility located at the

Field's Point Wastewater Treatment Facility
2 Ernest Street
Providence, Rhode Island 02905
and
associated Combined Sewer Overflows

to receiving waters named

Providence, Seekonk, Moshassuck, West, and Woonasquatucket Rivers

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on _____.

This permit and the authorization to discharge expire at midnight, five (5) years from the effective date.

This permit supersedes the permit issued on December 31, 2001.

This permit consists of 32 pages in Part I including effluent limitations, monitoring requirements, etc. and 10 pages in Part II including General Conditions.

Signed this day of , 2017.

DRAFT

Angelo S. Liberti, P.E., Chief of Surface Water Protection
Office of Water Resources
Rhode Island Department of Environmental Management
Providence, Rhode Island

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

- During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A (Advanced Treatment Discharge After Disinfection).

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Quantity - lbs./day		Discharge Limitations		Concentration - specify units			Monitoring Requirement	
	Monthly Average	Monthly Maximum Daily	Monthly Average *(Minimum)	Monthly Maximum Daily *(Maximum)	Weekly Average *(Average)	Daily *(Maximum)	Measurement Frequency	Sample Type	
Flow (To Plant Headworks)	--- MGD	--- MGD ¹	---	---	---	---	Continuous	Recorder	
Flow (To Advanced Treatment)	65 MGD	--- MGD ¹	---	---	---	---	Continuous	Recorder	
CBOD ₅ (Nov. 1 – Apr. 30)	13,553	24,395	25 mg/l	45 mg/l	40 mg/l	45 mg/l	1/Day	24-Hr. Comp.	
CBOD ₅ (May 1 – Oct. 31)	5,421	8,132	10 mg/l	15 mg/l	10 mg/l	15 mg/l	1/Day	24-Hr. Comp.	
CBOD ₅ - % Removal	85%	---	---	---	---	---	1/Month	Calculated	
TSS (Nov. 1 – Apr. 30)	16,263	27,105	30 mg/l	50 mg/l	45 mg/l	50 mg/l	1/Day	24-Hr. Comp.	
TSS (May 1 – Oct. 31)	10,842	16,263	20 mg/l	30 mg/l	20 mg/l	30 mg/l	1/Day	24-Hr. Comp.	
TSS-% Removal	85%	---	---	---	---	---	1/Month	Calculated	
Settleable Solids	---	---	---	---	---	---	1/Day	Grab	

--- Signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

Sampling for TSS, CBOD₅, Flow, and Settleable Solids shall be performed Sunday-Saturday. All CBOD₅, and TSS samples shall be taken on the influent and effluent.

¹Flow to the WWTF's headworks shall be reported. All flows received at the same headworks shall receive at least primary treatment and disinfection. Up to 77 MGD must receive advanced treatment. Flows greater than 77 MGD shall be diverted to the wet weather treatment facility – Outfall 002A.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 001A (Advanced Treatment Discharge After Disinfection).

PART I
A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A (Advanced Treatment Discharge After Disinfection).

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Quantity - lbs./day		Discharge Limitations		Concentration - specify units		Monitoring Requirement	
	Monthly Average	Maximum Daily	Monthly Average *(Minimum)	Weekly Average *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type	
Enterococci			35 cfu ¹ 100 ml		276 cfu ¹ 100 ml	2/Day	Grab ²	
Fecal Coliform			---MPN ¹ 100 ml	---MPN ¹ 100 ml	---MPN ¹ 100 ml	1/Day	Grab ²	
Total Residual Chlorine (TRC)			65.0 ug/l ³		65.0 ug/l ³	6/Day	Grab	
pH			(6.0 SU)		(9.0 SU)	1/Day	Grab	

¹ The Geometric Mean shall be used to obtain the "maximum daily" (when there are multiple sampled in a day), "weekly average", and the "monthly average" values.

² The Fecal Coliform sample shall be taken at the same time as one of the Enterococci samples. Compliance with the Enterococci limitations shall be determined by taking a minimum of two (2) grab samples per day, separated by a minimum of three (3) hours, unless good cause exists for not having the minimum separation. In the event that the permittee believes that good cause exists, written documentation, in the form of a cover letter to the permittee's Discharge Monitoring Reports, must be submitted to the DEM demonstrating that good cause existed. The facility shall report any fecal coliform sample result that exceeds 400 MPN/100 ml to the RIDEM in accordance with the 24-hour reporting requirements under Part II(I)(5) of the permit.

³ The use of a continuous TRC recorder after chlorination and prior to disinfection is required to provide a record that proper disinfection was achieved at all times. Compliance with these limitations shall be determined by taking six (6) grab samples per day with a minimum of three (3) hours between grabs. The maximum daily and average monthly values are to be computed from the averaged grab sample results for each day. The following methods may be used to analyze the grab samples: (1) Low Level Amperometric Titration, Standard Methods (18th Edition) No. 4500-Cl E; (2) DPD Spectrophotometric, EPA No. 330.5 or Standard Methods (18th Edition) No. 4500-Cl G.

*Values in parentheses () are to be reported as Minimum/Average/Maximum for the reporting period rather than Average Monthly/Average Weekly/Maximum Daily.

Sampling for Fecal Coliform, Enterococci, pH, and Chlorine Residual shall be performed Sunday-Saturday.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 001A (Advanced Treatment Discharge After Disinfection).

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A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A (Advanced Treatment Discharge After Disinfection).

Such discharges shall be monitored by the permittee as specified below:

<u>Effluent Characteristic</u>	<u>Quantity - lbs./day</u>		<u>Discharge Limitations</u>		<u>Concentration - specify units</u>		<u>Monitoring Requirement</u>	
	<u>Monthly Average</u>	<u>Maximum Daily</u>	<u>Monthly Average</u>	<u>Maximum Daily</u>	<u>Weekly Average</u>	<u>Maximum Daily</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Oil and Grease			---	mg/l		---	mg/l	1/Month 3 Grabs ¹
Phosphorus, Total			---	mg/l		---	mg/l	1/Week 24-Hr. comp.
TKN			---	mg/l		---	mg/l	3/Week 24-Hr. Comp.
Nitrite, Total (as N)			---	mg/l		---	mg/l	3/Week 24-Hr. Comp.
Nitrate, Total (as N)			---	mg/l		---	mg/l	3/Week Calculated
Nitrogen, Total (TKN + Nitrate + Nitrite, as N)								
May - Oct	2,711 lb/day		5.0 mg/l			---	mg/l	3/week Calculated
Nov - Apr	---	lb/day ²	---	mg/l ²		---	mg/l ²	3/Week Calculated

¹ Three (3) grab samples shall be collected per with a minimum of six (6) hours between samples. Each grab sample must be analyzed individually and the maximum values reported.

² The permittee shall operate the treatment facility to reduce the discharge of Total Nitrogen, during the months of November through April, to the maximum extent possible using all available treatment equipment in place at the facility, except carbon source.

--- Signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

Samples taken in compliance with the monitoring requirements specified above shall be taken Monday through Friday at the following locations: Outfall 001A (Advanced Treatment Discharge After Disinfection).

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A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

4. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A (Advanced Treatment Discharge After Disinfection).

Such discharges shall be monitored by the permittee as specified below:

<u>Effluent Characteristic</u>	<u>Discharge Limitations</u>		<u>Concentration - specify units</u>		<u>Monitoring Requirement</u>		
	<u>Quantity - lbs./day</u> <u>Monthly</u> <u>Average</u>	<u>Maximum</u> <u>Daily</u>	<u>Monthly</u> <u>Average</u>	<u>Weekly</u> <u>Average</u>	<u>Maximum</u> <u>Daily</u>	<u>Measurement</u> <u>Frequency</u>	<u>Sample</u> <u>Type</u>
Arsenic, Total ¹	5.4 ug/l		5.4 ug/l		306.3 ug/l	2/week	24-Hr. Comp.
Copper, Total ¹	24.5 ug/l		24.5 ug/l		24.5 ug/l	2/Week	24-Hr. Comp.
Cyanide, Available ¹	4 ug/l ²		4 ug/l ²		4 ug/l ²	2/Week	24-Hr. Comp. ³
Nickel, Total ¹	127 ug/l		127 ug/l		331 ug/l	2/Week	24-Hr. Comp.
Ammonia, Total (as N)	---		---		---	1/Month	24-Hr. Comp.
Zinc, Total ¹	---		---		---	1/Month	24-Hr. Comp.
Cadmium, Total ¹	---		---		---	1/Month	24-Hr. Comp.
Chromium, Hexavalent ¹	---		---		---	1/Month	24-Hr. Comp.
Lead, Total ¹	---		---		---	1/Month	24-Hr. Comp.
Aluminum, Total ¹	---		---		---	1/Month	24-Hr. Comp.

--- Signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

¹ Samples shall be taken on the influent and effluent with appropriate allowances for hydraulic detention (flow-through) time.

² The limit at which compliance/noncompliance determinations will be based is the Quantitation Limit, which is defined as 10 ug/l for Cyanide. This value may be reduced by permit modification as more sensitive methods are approved by EPA and the State.

³ Compliance with these limitations shall be determined by taking three grab samples per eight-hour shift with a minimum of two (2) hours between grabs, and preserved immediately upon collection. All samples shall be composited, then analyzed for Available Cyanide.

Samples taken in compliance with the monitoring requirements specified above shall be taken Monday through Friday at the following locations: Outfall 001A (Advanced Treatment Discharge After Disinfection).

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A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

- During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A (Advanced Treatment Discharge After Disinfection).

Such discharges shall be monitored by the permittee as specified below:

<u>Effluent Characteristic</u>	<u>Quantity - lbs./day</u>		<u>Concentration - specify units</u>		<u>Monitoring Requirement</u>	
	<u>Monthly Average</u>	<u>Maximum Daily</u>	<u>Monthly Average</u>	<u>Weekly Average</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
<u>Mysidopsis bahia</u> LC50 ¹					1/Quarter	24-Hr. Comp.
<u>Arbacia punctulata</u> C-NOEC ³				100% or Greater ²	1/Quarter	24-Hr. Comp.

¹LC₅₀ is defined as the concentration of wastewater that causes mortality to 50% of the test organisms.

²The 100% or greater limit is defined as a sample that is composed of 100% effluent.

³C-NOEC is defined as the highest concentration of toxicant or effluent at which no adverse effects are observed.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfall 001A in accordance with I.B. of the permit.

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A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

6. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number(s) 002A (Treated Wet Weather Outfall – South Channel). Such discharges shall be monitored by the permittee as specified below:

Effluent Characteristic	Quantity - lbs./day		Concentration - specify units		Monitoring Requirement	
	Monthly Average	Maximum Daily	Monthly Average *(Minimum)	Weekly Average *(Average)	Measurement Frequency	Sample Type
Flow	--- MGD	123 MGD			Continuous	Recorder
CBOD ₅			--- mg/l	--- mg/l	When in Use ¹	24-Hr. Comp. (Hourly Grabs)
CBOD ₅ -% Removal ¹	---% ¹				When in Use ¹	Calculated
TSS			--- mg/l	--- mg/l	When in Use ¹	24-Hr. Comp. (Hourly Grabs)
TSS-% Removal ¹	---% ¹				When in Use ¹	Calculated

¹Percent Removal shall be calculated using the equation in Part I.D.1.c of the permit. For monitoring purposes, an overflow is defined as any occurrence of a discharge from the wet weather facility with a minimum duration of 15 minutes. Overflows shall be considered to be separate if they are separated by six (6) hours or more. During months of no overflow, DMR's shall be marked as "no discharge". All wet weather overflows created by storm events that are greater than the one year six hour storm are not subject to these limitations and should not be included in DMR reporting calculations. However, any wet weather overflow, regardless of the size of the storm event, must be reported to the DEM's Operations and Maintenance Program.

--- Signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

*Values in parentheses () are to be reported as Minimum/Average/Maximum for the reporting period rather than Average Monthly/Average Weekly/Maximum Daily.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 002A (Treated Wet Weather Outfall – South Channel).

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A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

7. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number(s) 002A (Treated Wet Weather Outfall – South Channel). Such discharges shall be monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations		Concentration - specify units		Monitoring Requirement	
	Quantity - lbs./day	Monthly Average	Monthly Average	Weekly Average	Measurement Frequency	Sample Type
Fecal Coliform ¹	Maximum Daily	*(Minimum)	*(Average)	*(Maximum)	When in Use ²	Grab ^{3,4}
Enterococci ¹	--- cfu 100 mL	--- MPN 100 ml	--- ug/l ⁶	--- MPN 100 ml	When in Use ²	Grab ^{3,4}
Total Residual Chlorine (TRC) ^{1,5}	--- ug/l ⁶	--- ug/l ⁶	--- ug/l ⁶	20 ug/l ⁶	When in Use	Grab ⁴

¹The TRC, Fecal Coliform, and Enterococci samples shall be taken at the same time.

²For monitoring purposes, an overflow is defined as any occurrence of a discharge from the wet weather facility with a minimum duration of 15 minutes. Overflows shall be considered to be separate if they are separated by six (6) hours or more. During months of no overflow, DMR's shall be marked as "no discharge". All wet weather overflows created by storm events that are greater than the one year six hour storm are not subject to these limitations and should not be included in DMR reporting calculations. However, any wet weather overflow, regardless of the size of the storm event, must be reported to the DEM's Operations and Maintenance Program.

³The Geometric Mean shall be used to obtain the "monthly average", "weekly average", and "daily maximum" (when there are multiple samples taken in a given day) fecal coliform and enterococci results. Sampling for treated wet weather overflows taken between the hours of 2:30AM - 3:00PM on weekdays and during the hours of 2:30AM - 11:00AM on weekends/holidays shall be reported on Discharge Monitoring Reports. Sampling at all times shall be reported on Monthly Operating Reports.

⁴One grab sample shall be taken per day of each overflow event. If an overflow event lasts longer than 24 hours, a grab sample shall be taken for each 24-hour period of the event. ⁵At each sampling event, one TRC sample shall be taken after chlorination but prior to dechlorination to verify that the wet weather flow has been properly chlorinated and one TRC sample shall be taken after dechlorination to verify that the wet weather flow has been properly dechlorinated. The sample after dechlorination shall be reported on DMR's.

⁶The following methods may be used to analyze the grab samples: (1) Low Level Amperometric Titration, Standard Methods (18th Edition) No. 4500-CI E; (2) DPD Spectrophotometric, EPA No. 330.5 or Standard Methods (18th Edition) No. 4500-CI G.

--- Signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

*Values in parentheses () are to be reported as Minimum/Average/Maximum for the reporting period rather than Average Monthly/Average Weekly/Maximum Daily.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 002A (Treated Wet Weather Outfall – South Channel).

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- a. The pH of the effluent shall not be less than 6.0 nor greater than 9.0 standard units at any time, unless these values are exceeded due to natural causes or as a result of the approved treatment processes.
 - b. The discharge shall not cause visible discoloration of the receiving waters.
 - c. The effluent shall contain neither a visible oil sheen, foam, nor floating solids at any time.
 - d. The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and 5-day carbonaceous biochemical oxygen demand during dry weather conditions. Dry weather is defined as any calendar day on which there is less than 0.1 inches of rain and no snow melt. The percent removal shall be based on monthly average values.
 - e. When the effluent discharged for a period of 90 consecutive days exceeds 80 percent of the designed flow, the permittee shall submit to the permitting authorities a projection of loadings up to the time when the design capacity of the treatment facility will be reached, and a program for maintaining satisfactory treatment levels consistent with approved water quality management plans.
 - f. The permittee shall analyze its effluent semi-annually for the EPA Priority Pollutants as listed in 40 CFR 122, Appendix D, Table II and III. One sample must be conducted with the 3rd Quarter bioassay sample and must be submitted to the DEM with the bioassay by October 15th. The results of the second analysis shall be submitted to the Department of Environmental Management by January 15th for the previous calendar year. The State user fee samples may be utilized provided that the sampling is coordinated in advance. All sampling and analysis shall be done in accordance with EPA Regulations, including 40 CFR, Part 136; grab and composite samples shall be taken as appropriate.
 - g. This permit serves as the State's Water Quality Certificate for the discharges described herein.

B. BIOMONITORING REQUIREMENTS AND INTERPRETATION OF RESULTS

1. General

Beginning on the effective date of the permit, the permittee shall perform four (4) acute and four (4) chronic toxicity tests per year on samples collected from discharge outfall 001. The permittee shall conduct the tests during dry weather periods (no rain within forty-eight (48) hours prior to or during sampling unless approved by DEM) according to the following test frequency and protocols. Data shall be reported as outlined in Section I.B.10. The State may require additional screening, range finding, and/or definitive acute or chronic bioassays as deemed necessary based on the results of the initial bioassays required herein. Indications of toxicity could result in requiring a Toxicity Reduction Evaluation (TRE) to investigate the causes and to identify corrective actions necessary to eliminate or reduce toxicity to an acceptable level.

2. Test Frequency

On four sampling events, (one each calendar quarter) the permittee will conduct toxicity tests on the two species listed below, for a total of eight toxicity tests per year. This requirement entails performing two-species testing as follows:

<u>Species</u>	<u>Test Type</u>	<u>Frequency</u>
Mysids (<u>Mysidopsis bahia</u>)	Definitive 48-Hour Acute Static (LC ₅₀)	Quarterly
<u>Arbacia punctulata</u>	Sea Urchin 1 hour fertilization test (chronic)	Quarterly

3. Testing Methods

Toxicity tests shall be conducted in accordance with protocols listed in 40 CFR Part 136.

4. Sample Collection

For each sampling event a twenty-four- (24) hour flow proportioned composite final effluent sample shall be collected during a dry weather (no rain forty-eight (48) hours prior to or during sampling unless approved by DEM). This sample shall be kept cool (at 4°C) and testing shall begin within twenty-four (24) hours after the last sample of the composite is collected. In the laboratory, the sample will be split into two (2) subsamples, after thorough mixing, for the following:

A: Chemical Analysis

B: Toxicity Testing

All samples held overnight shall be refrigerated at 4°C. Grab samples must be used for pH and temperature.

5. Salinity Adjustment

Prior to the initiation of testing, the effluent must be adjusted to make the salinity of the effluent equal to that of the marine dilution water. The test solution must be prepared by adding non-toxic dried ocean salts to a sufficient quantity of 100% effluent to raise the salinity to the desired level. After the addition of the dried salts, stir gently for thirty (30) to sixty (60) minutes, preferably with a magnetic stirrer, to ensure that the salts are in solution. It is important to check the final salinity with a refractometer or salinometer. Salinity adjustments following this procedure and in accordance with EPA protocol will ensure that the concentrations (% effluent) of each dilution are real and allow for an accurate evaluation with the acute permit limit and chronic monitoring requirements.

6. Dilution Water

Dilution water used for marine acute toxicity analyses should be of sufficient quality to meet minimum acceptability of test results (See Sections I.B.7 and I.B.8). For both species, natural seawater shall be used as the dilution water. This water shall be collected from Narragansett Bay off the dock at the URI's Graduate School of Oceanography on South Ferry Road, Narragansett. It is noted that the University claims no responsibility for the personal safety on this dock. The permittee shall observe the rules posted at the dock. If this natural seawater diluent is found to be, or suspected to be toxic or unreliable, an alternate source of natural seawater or, deionized water mixed with hypersaline brine or artificial sea salts of known quality with a salinity and pH similar to that of the receiving water may be substituted AFTER RECEIVING WRITTEN APPROVAL FROM DEM.

7. Effluent Toxicity Test Conditions for Mysids¹
(Mysidopsis bahia)

a.	Test Type	48-Hour Static Acute Definitive
b.	Salinity	25 ppt ± 10% for all dilutions
c.	Temperature (C)	25° ± 1°C
d.	Light Quality	Ambient laboratory illumination

e.	Photoperiod	8 - 16 Hour Light/24-Hour
f.	Test Chamber Size	250 ml
g.	Test Solution Volume	200 ml
h.	Age of Test Organisms	1 - 5 Days
i.	No. Mysids per Test Chamber	10
j.	No. of Replicate Test Chamber Per Concentration	2
k.	Total No. Mysids per Test Concentration	20
l.	Feeding Regime	Light feeding (two (2) drops concentrated brine shrimp nauplii, approx. 100 nauplii per mysid twice daily).
m.	Aeration	None, unless dissolved oxygen concentration falls below 40% of saturation at which time gentle single-bubble aeration should be started.
n.	Dilution Water	Narragansett Bay water as discussed above.
o.	Dilutions	Five (5) dilutions plus a control: 100%, 50%, 25%, 12.5%, 6.25% and 0% effluent.
p.	Effect Measured and Test	Mortality - no movement of body test duration or appendages on gentle prodding, 48-hour LC ₅₀ and NOAEL.
q.	Test Acceptability	90% or greater survival of test organisms in control solution.
r.	Sampling Requirements	Samples are collected and used within 24 hours after the last sample of the composite is collected.
s.	Sample Volume Required	Minimum four (4) liters
8.	Test Conditions for <u>Arbacia Punctulata</u> Fertilization Test ¹	
a.	Test type	Static
b.	Salinity	30 0/00 ± 2 0/00
c.	Temperature (C)	20 ± 1°C
d.	Light quality	Ambient laboratory light during test preparation

- e. Light intensity 10-20 uE/m²/s, or 50-100 ft-c
(Ambient Laboratory Levels)
- f. Test vessel size Disposable (glass) liquid scintillation
vials (20 ml capacity), not pre-cleaned
- g. Test solution volume 5 ml
- h. Number of sea urchins Pooled sperm from four (4) males and
pooled eggs from four (4) females are
used per test
- i. Number of egg and sperm cells
per chamber About 2000 eggs and 5,000,000
sperm cells per vial
- j. Number of replicate
chambers per concentration 4 (minimum of 3)
- k. Dilution water Narragansett Bay water as discussed
above
- l. Dilution factor Approximately 0.5
- m. Test duration 1 hour and 20 minutes
- n. Effects measured Fertilization of sea urchin eggs
- o. Number of treatments per test Minimum of five (5) effluent
concentrations and a control.
An additional dilution at the
permitted effluent concentration
(% effluent) is required.
- p. Acceptability of test results Recommended sperm: egg ratio
should result in fertilization of
minimum of 70% of the eggs in
the control chambers.

9. Chemical Analysis

The following chemical analysis shall be performed for every two-species sampling event.

<u>Parameter</u>	<u>Saline Effluent</u>	<u>Detection Diluent</u>	<u>Limit (mg/l)</u>
pH	X	X	---
Specific Conductance	X	X	---
Total Solids and Suspended Solids	X	X	---
Ammonia	X		0.1
Total Organic Carbon	X		0.5

Cyanide	X		0.01
Total Phenols	X		0.05
Salinity	X	X	PPT(0/00)

During the first, second, and fourth calendar quarter bioassay sampling events the following chemical analyses shall be performed:

<u>Total Metals</u>	<u>Effluent</u>	<u>Saline Diluent</u>	<u>Detection Limit (ug/l)</u>
Total Cadmium	X		0.1
Total Copper	X	X	1.0
Total Chromium (VI)	X		20.0
Total Zinc	X		5.0
Total Nickel	X		1.0
Total Lead	X	X	1.0
Total Aluminum	X		5.0

The above metal analyses may be used to fulfill, in part or in whole, other monitoring requirements in the permit for these specific metals.

During the third calendar quarter bioassay sampling event, the final effluent sample collected during the same twenty-four (24) hour period as the bioassay sample, shall be analyzed for priority pollutants (as listed in Tables II and III of Appendix D of 40 CFR 122). The bioassay priority pollutant scan shall be a full scan and may be coordinated with other permit conditions to fulfill any priority pollutant scan requirements.

10. Toxicity Test Report Elements

A report of results will include the following:

- Description of sample collection procedures and site description.
- Names of individuals collecting and transporting samples, times, and dates of sample collection and analysis.
- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests (quality assurance); light and temperature regime; dilution water description; other information on test conditions if different than procedures recommended.
- The method used to adjust the salinity of the effluent must be reported.
- All chemical and physical data generated (include detection limits).
- Raw data and bench sheets.
- Any other observations or test conditions affecting test outcome.

Toxicity test data shall include the following:

Acute

- Survival for each concentration and replication at time twenty-four (24) and forty-eight (48) hours.

- LC₅₀ and 95% confidence limits shall be calculated using one of the following methods in order of preference: Probit, Trimmed Spearman Karber, Moving Average Angle, or the graphical method. All printouts (along with the name of the program, the date, and the author(s)) and graphical displays must be submitted. When data is analyzed by hand, worksheets should be submitted. The report shall also include the No Observed Acute Effect Level (NOAEL) which is defined as the highest concentration of the effluent (in % effluent) in which 90% or more of the test animals survive.
- The Probit, Trimmed Spearman Karber, and Moving Average Angle methods of analyses can only be used when mortality of some of the test organisms are observed in at least two (2) of the (percent effluent) concentrations tested (i.e., partial mortality). If a test results in a 100% survival and 100% mortality in adjacent treatments ("all or nothing" effect), an LC₅₀ may be estimated using the graphical method.

Chronic

- The endpoints of toxicity tests using the sea urchin are based on the reduction in percent of eggs fertilized. Chronic test data shall undergo hypothesis testing to determine if the distribution of results is normal using the Shapiro-Wilks test. The variance must also be tested for homogeneity using Bartlett's Test. Then the endpoint estimates, NOEC and LOEC must be determined using Dunnett's Procedure, Bonferroni's T-Test, Steel's Many-One Rank Test, or Wilcoxon Rank Sum Test. The choice of test depends on the number of replicates and whether the variance is homogeneous or not. See EPA/600/4-87/028 for details. (All printouts and graphics displays must be submitted along with the name of the program, the date, and the author(s). When data is analyzed by hand, the worksheets should be submitted).
- C-NOEC Chronic No Observed Effect Concentration
- LOEC Lowest Observed Effect Concentration
- MATC Maximum Allowable Toxicant Concentration

11. Special Condition

Due to the fact that the suggested dilution water for this facility to use in conducting the bioassays is from the end of the dock at the URI's Narragansett Bay Campus, a Letter of Agreement must be signed and submitted to the Graduate School of Oceanography. Requests to use another source of dilution water will have to be approved by the Department of Environmental Management.

12. Reporting of Bioassay Testing

Bioassay Testing shall be reported as follows:

<u>Quarter Testing to be Performed</u>	<u>Results Submitted on DMR for</u>
January 1 - March 31	March
April 1 - June 30	June
July 1 - September 30	September
October 1 - December 31	December

Reports shall be maintained by the permittee and shall be made available upon request by RIDEM.

C. INDUSTRIAL PRETREATMENT PROGRAM

1. Definitions

For the purpose of this permit, the following definitions apply.

- a. 40 CFR 403 and sections thereof refer to the General Pretreatment regulations, 40 CFR Part 403 as revised.
- b. Categorical Pretreatment Standards mean any regulation containing pollutant discharge limits promulgated by the USEPA in accordance with section 307(b) and (c) of the Clean Water Act (33 USC 1251), as amended, which apply to a specific category of industrial users and which appears in 40 CFR Chapter 1, subchapter N.
- c. Pretreatment Standards include all specific prohibitions and prohibitive discharge limits established pursuant to 40 CFR 403.5, including but not limited to, local limits, and the Categorical Pretreatment Standards.
- d. Regulated Pollutants shall include those pollutants contained in applicable categorical standards and any other pollutants listed in the Pretreatment Standards which have reasonable potential to be present in an industrial user's effluent.

2. Implementation

The authority and procedures of the Industrial Pretreatment Program shall at all times be fully and effectively exercised and implemented, in compliance with the requirements of this permit and in accordance with the legal authorities, policies, procedures and financial provisions described in the permittee's approved Pretreatment Program and Sewer Use Rules and Regulations, the Rhode Island Pretreatment Regulations and the General Pretreatment Regulations 40 CFR 403. The permittee shall maintain adequate resource levels to accomplish the objectives of the Pretreatment Program.

3. Local Limits

Pollutants introduced into POTWs by a non-domestic source (user) shall not: pass through the POTW, interfere with the operation or performance of the works, contaminate sludge as to adversely affect disposal options, or adversely affect worker safety and health.

- a. Within thirty (30) days of the effective date of this permit, the permittee shall submit to the DEM, in the form of a non-substantial program modification request, a local limits monitoring plan and procedures to ensure that an adequate database is available for periodic evaluation and, if necessary, re-development of local limits. At a minimum, the monitoring plan and procedures must ensure that adequate, site-specific data is available to calculate, for all pollutants of concern, POTW removal efficiencies, concentrations of pollutants entering advanced treatment, the volume of sludge produced and the pollutant concentrations contained therein, and the pollutant loadings contributed to the POTW from domestic sources. In addition, the monitoring plan must provide for at least annual analysis of the POTW's influent for all priority pollutants in order to identify additional or new pollutants of concern. The monitoring plan should incorporate and utilize to the extent possible the monitoring required by Part I.A of this permit. The permittee is referred to Section 4.3.2 of EPA's July, 2004 Local Limits Guidance Manual for assistance in development the monitoring plan and procedures. Upon review, the DEM will provide written notification either granting approval of the monitoring plan and procedures or stating the deficiencies revealed therein. Should the DEM determine that a deficiency exists in the submittal, the permittee shall submit to the DEM, within thirty (30) days of the receipt of said notice, a revised monitoring plan and procedures consistent with the DEM's notice of deficiency. No longer than thirty (30) days following DEM's final approval, the permittee shall commence implementation of the monitoring plan and procedures.

- b. Within ninety (90) days of the effective date of the permit, the permittee shall submit to the DEM a workplan and schedule for completing an evaluation of the local discharge limitations for non-domestic users. The plan shall include, but not be limited to, the development of local limits for Total Nitrogen, Total Ammonia, Total Arsenic and Biochemical Oxygen Demand. The workplan must provide a description of the analysis to be performed, a brief summary of existing data which will be used in the evaluation, and a description of additional sampling and analysis to be performed during the evaluation. The DEM will review the workplan and provide written comment. Should the DEM determine that a deficiency exists in the proposed workplan, the permittee shall submit a revised workplan within thirty (30) days of receipt of said notice. Upon approval, the permittee shall complete the workplan in accordance with the approved schedule.
 - c. Within six (6) months of DEM acceptance of the workplan described in Part I.C.3.a above, the permittee shall submit to the DEM a technical local limits evaluation in accordance with procedures set forth in the July, 2004 EPA Local Limits Guidance Manual and the approved workplan specified above in Part I.C.3.b of this permit. All supporting data must be submitted with the evaluation. Within sixty (60) days of the receipt of preliminary approval of the proposed local limits (unless a longer timeframe is specified therein), the permittee shall submit to the DEM a request for a pretreatment program modification in accordance with 40 CFR 403.18 and Part I.C.5.e of this permit. Upon final approval by the DEM and adoption by the permittee, these standards shall be deemed Pretreatment Standards for the purposes of Section 307(d) of the Clean Water Act.
 - d. Within thirty (30) days of final approval, the permittee shall adopt the revised local limits and reissue or modify all applicable industrial user permits to contain the modified local limits.
 - e. At the time of renewal of this permit and in accordance with 40 CFR 122.21(j)(4) as revised July 24, 1990, the permittee shall submit to the DEM with its permit renewal application a written technical evaluation of the need to revise local limits. The evaluation shall be based, at a minimum, on information obtained during the implementation of the permittee's local limits monitoring plan and current RIPDES permit discharge limits, sludge disposal criteria, secondary treatment inhibition, and worker health and safety criteria.
4. Enforcement Response Plan (ERP)

On September 29, 2003 DEM issued a determination that the permittee's May 9, 2003 ERP meets the requirements of 40 CFR 403.8(f)(5). The permittee shall continue to implement its approved ERP and any subsequent amendments approved by DEM, at all times.

5. General

- a. The permittee shall carry out inspection, surveillance, and monitoring procedures which will determine, independent of information supplied by the industrial user, whether the industrial user is in compliance with Pretreatment Standards. At a minimum, all significant industrial users shall be inspected and monitored for all regulated pollutants (as determined by the permittee's approved Industrial Pretreatment Program on a case-by-case basis) at the frequency established in the approved Industrial Pretreatment Program but in no case less than once per year (one (1) year being determined as the reporting year established in Part I.C.7 of this permit). In addition, these inspections, monitoring and surveillance activities must be conducted in accordance with EPA's Industrial User Inspection and Sampling Manual for POTW's, April 1994. All inspections, monitoring, and surveillance activities shall be performed, and have records maintained, with sufficient care to produce evidence admissible in enforcement proceedings or judicial actions. The permittee shall evaluate, at least every two years unless specific 40 CFR 403 Streamlining provisions have been adopted to the contrary, whether each SIU requires a slug control plan. If a slug control plan is required, it must include, at a minimum, those elements contained in 40 CFR 403.8(f)(2)(vi).

- b. The permittee shall reissue all necessary Industrial User (IU) control mechanisms within thirty (30) days of their expiration date. The permittee shall issue, within sixty (60) days after the determination that an IU is a Significant Industrial User (SIU), all SIU control mechanisms. All SIU control mechanisms must contain, at a minimum, those conditions stated in 40 CFR 403.8(f)(1)(iii)(B). All control mechanisms must be mailed via Certified Mail, Return Receipt Requested. A complete bound copy of the control mechanism with the appropriate receipt must be kept as part of the Industrial User's permanent file. In addition, the permittee must develop a Permit Fact Sheet describing the basis for the SIU's permit and retain this fact sheet as part of the SIU's permanent file.
- c. The permittee must identify each instance of noncompliance with any pretreatment standard and/or requirement and take a formal documented action for each instance of noncompliance. Copies of all such documentation must be maintained in the Industrial User's permanent file.
- d. The permittee shall prohibit Industrial Users from the dilution of a discharge as a substitute for adequate treatment in accordance with 40 CFR 403.6(d).
- e. The permittee shall comply with the procedures of 40 CFR 403.18 for instituting any modifications of the permittee's approved Pretreatment Program. Significant changes in the operation of a POTW's Approved Pretreatment Program must be submitted and approved following the procedures outlined in 40 CFR 403.18(b) and 403.9(b). However, the endorsement of local officials responsible for supervising and/or funding the pretreatment program required by 403.9(b)(2) will not be required until DEM completes a preliminary review of the submission. The DEM will evaluate and review the permittee's initial proposal for a modification and provide written notification either granting preliminary approval of the proposed modifications or stating the deficiencies contained therein. DEM's written notification will also include a determination whether the submission constitutes a substantial or non-substantial program modification as defined by 40 CFR 403.18. Should DEM determine that a deficiency exists in the proposed modification, the permittee shall submit to DEM, within thirty (30) days of the receipt of said notice, a revised submission consistent with DEM's notice of deficiency.

Pretreatment program modifications which the permittee considers non-substantial, shall be deemed to be approved within forty-five (45) days after submission of the request for modification, unless DEM determines that the modification is in fact a substantial modification or notifies the permittee of deficiencies. Upon receipt of notification that DEM has determined the modification is substantial, the permittee shall initiate the procedures and comply with the deadlines for substantial modifications, which are outlined below.

For substantial modifications, the permittee shall, within sixty (60) days (unless a longer time frame is granted) of the receipt of DEM's preliminary approval of the proposed modification, submit documentation (as required by 40 CFR 403.9(b)(2)) that any local public notification/participation procedures required by law have been completed, including any responses to public comments, and a statement that the local officials will endorse and/or approve the modification upon final approval by DEM.

Within thirty (30) days of DEM's final approval of the proposed modification, the permittee shall implement the modification and submit proof that the local officials have endorsed and/or approved the modification to the DEM. Upon final approval by the DEM and adoption by the permittee, this modification shall become part of the approved pretreatment program and shall be incorporated into this permit in accordance with 40CFR 122.63(g).

- f. All sampling and analysis required of the permittee, or by the permittee of any Industrial User, must be performed in accordance with the techniques described in 40 CFR 136.

- g. For those Industrial Users with discharges that are not subject to Categorical Pretreatment Standards, the permittee shall require appropriate reporting in accordance with 40 CFR 403.12(h).
- h. The permittee shall, in accordance with 40 CFR 403.12(f), require all Industrial Users to immediately notify the permittee of all discharges by the Industrial User that could cause problems to the POTW, including slug loadings, as defined by 40 CFR 403.5(b).
- i. The permittee shall require all Industrial Users to notify the permittee of substantial changes in discharge as specified in 40 CFR 403.12(j) and the permittee shall also notify DEM of each such substantial change in discharge prior to acceptance.
- j. The permittee shall require New Sources to install and have in operation all pollution control equipment required to meet applicable Pretreatment Standards before beginning to discharge. In addition, the permittee shall require New Sources to meet all applicable Pretreatment Standards within the shortest feasible time which shall not exceed ninety (90) days in accordance with 40 CFR 403.6(b).
- k. The permittee shall require all Industrial Users who are required to sample their effluent and report the results of analysis to the POTW to comply with signatory requirements contained in 40 CFR 403.12(l) when submitting such reports.
- l. The permittee shall determine, based on the criteria set forth in 40 CFR 403.8(f)(2)(vii), using the EPA method of "rolling quarters", the compliance status of each Industrial User. Any Industrial User determined to meet Significant Non-Compliance (SNC) criteria shall be included in an annual public notification as specified in 40 CFR 403.8(f)(2)(viii).
- m. The permittee shall require Industrial Users to comply with the notification and certification requirements of 40 CFR 403.12(p)(1), (3) and (4) pertaining to the discharge of substances to the POTW, which if disposed of otherwise, would be a hazardous waste under 40 CFR Part 261.
- n. The permittee shall continue to designate, as SIUs, those Industrial Users (IUs) which meet the definition contained in the permittee's Sewer Use Rules & Regulations.

The permittee shall notify each newly designated SIU of its classification as an SIU within thirty (30) days of identification and shall inform the SIU of the requirements of an SIU contained in 40 CFR 403.12.

6. Categorical Industrial Users (CIUs)

- a. The permittee shall require Industrial Users to comply with applicable Categorical Pretreatment Standards in addition to all applicable Pretreatment Standards and Requirements. The permittee shall require of all Categorical Industrial Users (CIUs), all reports on compliance with applicable Categorical Pretreatment Standards and Categorical Pretreatment Standard deadlines as specified in and in accordance with Sections (b), (d), (e) and (g) of 40 CFR 403.12. In addition, the permittee shall require Categorical Industrial Users to comply with the report signatory requirements contained in 40 CFR 403.12(l) when submitting such reports.
- b. If the permittee applies the Combined Wastestream Formula (CWF) to develop fixed alternative discharge limits of Categorical Pretreatment Standards, the application of the CWF and the enforcement of the resulting limits must comply with 40 CFR 403.6(e). The permittee must document all calculations within the control mechanism fact sheet and the resulting limits within the CIU's control mechanism. The permittee must ensure that the most stringent limit is applied to the CIU's effluent at end-of-pipe based upon a comparison of the resulting CWF limits and the permittee's local limits.

- c. If the permittee has or obtains the authority to apply and enforce equivalent mass-per-day and/or concentration limitations of production-based Categorical Pretreatment Standards, then the permittee shall calculate and enforce the limits in accordance with 40 CFR 403.6(c). The permittee must document all calculations within the control mechanism fact sheet and the resulting limits within the CIU's control mechanism.

7. Annual Report

The annual report for the permittee's program shall contain information pertaining to the reporting year which shall extend from January 1st through December 31st and shall be submitted to the DEM by March 15th. Each item below must be addressed separately and any items which are not applicable must be so indicated. If any item is deemed not applicable a brief explanation must be provided. The annual report shall include the following information pertaining to the reporting year:

- a. A listing of Industrial Users which complies with requirements stated in 40 CFR 403.12(i)(1). The list shall identify all Categorical Industrial Users, Significant Industrial Users and any other categories of users established by the permittee;
- b. A summary list of any notifications received by the permittee of any substantial change in the volume or character of pollutants being introduced into the POTW by new or existing IUs. If applicable, an evaluation of the quality and quantity of influent introduced into the POTW and any anticipated impact due to the changed discharge on the quantity or quality of effluent to be discharged from the POTW shall be included;
- c. A summary list of Industrial User compliance status. The summary shall identify the IUs determined to be in non-compliance, and if applicable, the type of enforcement actions taken and penalty amounts levied;
- d. A list of industries which were determined, in accordance with Part I.C.5.I of this permit, to be in significant non-compliance required to be published in a local newspaper and proof of publication, from the newspaper, averring that the names of these violators has been published;
- e. A summary list of inspection and monitoring activity performed by the permittee, including;
 - significant industrial users inspected by the POTW (include inspection dates for each industrial user);
 - significant industrial user sampled by the POTW (include sampling dates for each industrial user); NBC shall maintain records onsite that detail the date of each sampling analysis.
- f. A summary list of permit issuance/reissuance activities including the name of the industrial user, expiration date of previous permit, and issuance date of new permit;
- g. A summary list for each report/notification type required by 40 CFR 403.12 that was not received as required during the reporting year. All other records of notifications received in accordance with 40 CFR 403.12 shall be maintained in each Industrial User's file.
- h. A summary of public participation efforts including meetings and workshops held with the public and/or industry and notices/newsletters/bulletins published and/or distributed;
- i. A program evaluation in terms of program effectiveness, local limits application and resources which addresses but is not limited to:
 - A description of actions being taken to reduce the incidence of SNC by Industrial Users;
 - effectiveness of enforcement response program;
 - sufficiency of funding and staffing;
 - sufficiency of the Sewer Use Rules and Regulations and/or statutory authority;

- j. An evaluation of recent/proposed program modifications, both substantial and non-substantial, in terms of the modification type, implementation and actual/ expected effect (note proposed modifications must be submitted under separate cover along with the information required by 40 CFR 403.18);
- k. A detailed description of all interference and pass-through that occurred during the past year and, if applicable;
 - A thorough description of all investigations into interference and pass-through during the past year;
 - A description of the monitoring, sewer inspections and evaluations which were done during the past year to detect interference and pass-through, specifying pollutants analyzed and frequencies;
- l. A summary of the average, maximum concentration, minimum concentration, and number of data points used for pollutant analytical results for influent, effluent, sludge and any toxicity or bioassay data from the wastewater treatment facility. The summary shall include a comparison of influent sampling results versus the maximum allowable headworks loadings contained in the approved local limits evaluation and effluent sampling results versus water quality standards. Such a comparison shall be based on the analytical results required in Parts I.A and I.C. of this permit and any additional sampling data available to the permittee; and
- m. A completed Annual Pretreatment Program Report Summary Sheet.

8. Sewer Use Rules and Regulations

The permittee has approved Sewer Use Rules and Regulations which shall continue to be implemented at all times.

D. COMBINED SEWER OVERFLOWS (CSOs)

1. EFFLUENT LIMITATIONS

- a. During wet weather, the permittee is authorized to discharge from combined sewer outfalls (CSOs) listed in Part I.D.5, subject to the following:
 - i. The discharges shall comply with the EPA CSO Policy, including those requirements not specifically listed in this permit.
 - ii. The discharges shall receive treatment at a level providing Best Practicable Control Technology Currently Available (BPT), Best Conventional Pollutant Control Technology (BCT) to control and abate conventional pollutants and Best Available Technology Economically Achievable (BAT) to control and abate non-conventional and toxic pollutants. The DEM and EPA have made a Best Professional Judgment (BPJ) determination that BPT, BCT, and BAT for combined sewer overflow (CSO) control include the implementation of Nine Minimum Controls (NMC) specified below and detailed further in Part I.D.2. "Nine Minimum Controls, Minimum Implementation Levels" of this permit:
 - 1. The permittee shall implement Standard Operating Procedures for the proper operation and maintenance of the sewerage system and CSOs in order to reduce the magnitude, frequency, and duration of CSOs. The program shall include an effective Capacity, Management, Operation and Maintenance (CMOM) program to include regular inspections on sewers, regulators,

and equipment; to disconnect illegal connections; to perform repairs and/or replacements as needed; and the items in Parts I.E. and I.D.2.e of this permit.

2. The permittee shall implement Standard Operating Procedures that will maximize use of the collection system for wastewater storage that can be accommodated by the storage capacity of the collection system in order to reduce the magnitude, frequency, and duration of CSOs.
3. The permittee shall evaluate the CSO impacts from non-domestic users and take appropriate steps to minimize such impacts.
4. The permittee shall implement Standard Operating Procedures to operate the POTW treatment plant at maximum treatable flow during all wet weather flow conditions to reduce the magnitude, frequency, and duration of CSOs. The permittee shall deliver all flows to the treatment plant within the constraints of the treatment capacity of the POTW.
5. Dry weather overflows from CSO outfalls are prohibited. The permittee shall implement Standard Operating Procedures and proper operation and maintenance programs to detect and eliminate dry weather overflows, including but not limited to routine bacteria monitoring at key in-stream locations, flow monitoring at all CSOs, and implementation of an effective Capacity, Management, Operation, and Maintenance (CMOM) Program. Each dry weather overflow must be reported to DEM as soon as the permittee becomes aware of the overflow. When the permittee detects a dry weather overflow, the permittee shall begin corrective action immediately. All dry weather sanitary and/or industrial discharges from CSOs must be reported to DEM within twenty-four (24) hours in accordance with the reporting requirements for plant bypass (Paragraph M of Part II of this permit). The permittee shall inspect the dry weather overflow each subsequent day until the overflow has been eliminated.
6. The permittee shall implement measures to control solid and floatable materials in CSOs. These measures shall include, but not be limited to, a requirement for facilities permitted by the NBC's Industrial Pretreatment Program to establish Best Management Practices (BMPs) to control the discharge of litter from their site to the combined sewer system and having the NBC verify the effectiveness of the BMPs during annual pretreatment inspections required under Part I.C of this permit. Any deficiencies with the BMPs shall be brought to the attention of the pretreatment permit holder.
7. The permittee shall implement a pollution prevention program focused on reducing the impact of CSOs on receiving waters.
8. The permittee shall implement a public notification process to inform citizens of when and where CSOs occur. The process must include: (a) a mechanism to alert persons of the occurrence of CSOs and; (b) a system to determine the nature and duration of conditions that are potentially harmful for users of receiving waters due to CSOs. NBC's existing notification systems

employed to notify the public of CSO events (signage at CSO outfalls, flags, and notification to DEM of dry weather overflows) with the additional notification requirements from Part I.D.4 may be used to satisfy DEM's public notice reporting requirements.

9. The permittee shall monitor CSO outfalls to characterize CSO impacts and the efficacy of CSO controls.
- b. Within ninety (90) days of the effective date of this permit, the permittee shall submit an updated Nine Minimum Controls Plan to DEM for review and approval. The update shall include the status of the implementation of each of the minimum controls shown in Parts I.D.1.a.ii.1. – 9. of the permit and evaluate alternatives to enhance their effectiveness and reflect consideration of the schedule for implementation of Phase III of NBC's CSO controls.
 - i. Once approved by DEM, the Permittee shall implement the approved Nine Minimum Controls Plan.
 - ii. If the Nine Minimum Controls Plan is reviewed by the DEM the permittee may be notified at any time that the Plan does not meet one or more of the minimum requirements of Parts I.D.1.a.ii.1-9 of this permit. After such notification from the DEM, the permittee shall make changes to the Plan and shall submit a written certification that the requested changes have been made. Unless otherwise provided by the DEM, the permittee shall have thirty (30) days after such notification to make the necessary changes.
 - c. Percent removal for outfall 002A shall be calculated using the following formula:

$$\text{Wet Weather Monthly \% Removal} = \frac{\sum_{i=1}^n \left[\frac{(V_1 C_1) - [(V_2 C_2)]}{V_1 C_1} \right]_i}{n}$$

Where: i = Each storm event which sends flow to the wet weather facility;

n = Number of storm events that send flow to the wet weather facility in a month;

V₁ = Volume of flow that enters the wet weather facility

C₁ = Influent concentration (measured prior to headworks);

V₂ = Volume of flow discharged from the wet weather facility (Outfall 002A) using V₁ – the total Volume retained in the wet weather facility and pumped back to secondary treatment;

C₂ = Concentration of pollutants discharged from the wet weather facility (Outfall 002A);

2. Nine Minimum Controls, Minimum Implementation Levels

- a. The Permittee must implement the nine minimum controls in accordance with the documentation approved by DEM or as subsequently modified to enhance the effectiveness of the controls. This implementation must include the following controls plus other controls the Permittee can reasonably implement as set forth in the documentation.

- b. The direct discharge of holding tank wastes and septage to a CSO is prohibited. Discharges of holding tank wastes and septage into the sewer system must be at locations which minimize the likelihood of concentrated wastes being discharged from CSOs.
 - c. Dry weather overflows (DWOs) are prohibited. All dry weather sanitary and/or industrial discharges from CSOs must be reported to DEM within twenty-four (24) hours in accordance with the reporting requirements for plant bypass (Paragraph M of Part II of this permit).
 - d. NBC shall maintain CSO identification signs at each CSO in the Field's Point Service Area. The signs must comply with the minimum requirement as approved by DEM.
 - e. Operation and maintenance of the sewer system:
 - i. All catch basins owned by the permittee shall be cleaned a minimum of twice per year.
 - ii. All collection system pump stations in the permittee's service area shall be inspected at least weekly and all pump station generators shall be inspected a minimum of twice per year.
 - iii. All regulators shall be inspected at least twice a month.
 - iv. All tidegates shall be inspected and maintained on a monthly basis.
 - v. All sumps in the Field's Point Service Area associated with CSO regulators shall be cleaned quarterly.
 - vi. A report on tidegate and combined sewer overflow/regulator maintenance and repair during the previous six (6) months shall be submitted to the DEM, Office of Water Resources, by the 15th of January and July of each year. The report shall include which structures were checked and when, the condition of each one, which were reported and when, which ones must yet be repaired, the reasons any repair was delayed, and the anticipated repair schedule.
3. Within 180 days of the effective date of this permit, the permittee shall submit a proposed program to expand their existing program to encourage or require the implementation of practices to reduce the volume of stormwater discharged to the combined sewer systems to the DEM for review and approval. The submittal shall include but not be limited to consideration of sewer rate credits/modifications, grants, the use of supplemental environmental projects by users found in violation of NBC requirements, distribution of rain barrels, and providing technical assistance to customers and contributing municipalities for the implementation of green infrastructure practices at existing properties. The submittal shall also include a proposed schedule for the implementation of the program. Upon review, the DEM will provide written notification either granting approval of the program or stating the deficiencies revealed therein. Should the DEM determine that a deficiency exists, the permittee shall submit a revised program that addresses the DEM's deficiencies to the DEM within thirty (30) days of the receipt of said notice, unless a longer timeframe is specified by DEM. Upon DEM approval, the permittee shall commence implementation of the program in accordance with the approved schedule.

4. The permittee shall implement a web-based public notification process to inform the public of when and where CSOs occur. The notification system must include a map-based system that alerts persons of the occurrence of CSOs and the duration of CSOs.

5. Combined Sewer Overflows or Emergency Bypasses

<u>Discharge Serial No.</u>	<u>Location</u>	<u>Maximum Daily Flow That Could Be Discharged</u>	<u>Discharge Type</u>	<u>Receiving Water</u>
002A	Fields Point WWTF (Treated Wet Weather Outfall)	123.0 MGD	Combined Sewer Overflow/Emergency Bypass	Providence River
004A	Blackstone Street Extension	58.1 MGD	Combined Sewer Overflow	Providence River
005A	Henderson Street	20.0 MGD	Combined Sewer Overflow	Providence River
006A	Point Street Bridge	32.3 MGD	Combined Sewer Overflow	Providence River
007A	Elm Street & Eddy Street	62.0 MGD	Combined Sewer Overflow	Providence River
009A	Dorrance Street	161.5 MGD	Combined Sewer Overflow	Providence River
011A	Westminster Street	4.5 MGD	Combined Sewer Overflow	Providence River
012A	Market Square	29.0 MGD	Combined Sewer Overflow	Providence River
016A	Pike Street	10.3 MGD	Combined Sewer Overflow	Providence River
018A	India Street & South Main Street	34.9 MGD	Combined Sewer Overflow	Providence River
019A	Brook Street & India Street	90.4 MGD	Combined Sewer Overflow	Providence River
023A	Pitman Street	51.7 MGD	Combined Sewer Overflow	Seekonk River
025A	River Drive at York Pond	420.0 MGD	Combined Sewer Overflow	Seekonk River
027A	Butler Hospital	549.1 MGD	Combined Sewer Overflow	Seekonk River
030A	Canal Street	17.4 MGD	Combined Sewer Overflow	Moshassuck River
032A	Charles Street near Stevens Street	34.9 MGD	Combined Sewer Overflow	Moshassuck River
033A	Stevens Street	18.1 MGD	Combined Sewer Overflow	Moshassuck River
035A	Livingston Street	206.7 MGD	Combined Sewer Overflow	Moshassuck River

5. Combined Sewer Overflows or Emergency Bypasses (continued)

<u>Discharge Serial No.</u>	<u>Location</u>	<u>Maximum Daily Flow That Could Be Discharged</u>	<u>Discharge Type</u>	<u>Receiving Water</u>
036A	At Route 95 from Northup Street & Silver Spring Street	103.3 MGD	Combined Sewer Overflow	Moshassuck River (via 72" RI DOT stormline)
037A	Cemetery Street	96.9 MGD	Combined Sewer Overflow	Moshassuck River
039A	Hawkins Street	54.9 MGD	Combined Sewer Overflow	West River
041A	Park Street	19.4 MGD	Combined Sewer Overflow	Woonasquatucket River
042A	Holden Street	15.5 MGD	Combined Sewer Overflow	Woonasquatucket River
044A	Bath Street	11.0 MGD	Combined Sewer Overflow	Woonasquatucket River
045A	Rathbone Street	103.4 MGD	Combined Sewer Overflow	Woonasquatucket River
046A	Eagle Street - north side of the river	51.7 MGD	Combined Sewer Overflow	Woonasquatucket River
048A	Atwells Avenue	12.9 MGD	Combined Sewer Overflow	Woonasquatucket River
049A	Valley Street near Tippicanoe Street	87.2 MGD	Combined Sewer Overflow	Woonasquatucket River
050A	Delaine Street	9.0 MGD	Combined Sewer Overflow	Woonasquatucket River
051A	Plainfield Avenue & Manton Avenue	38.8 MGD	Combined Sewer Overflow	Woonasquatucket River
052A	Manton Avenue	29.1 MGD	Combined Sewer Overflow	Woonasquatucket River
053A	Off Hartford Avenue	45.2 MGD	Combined Sewer Overflow	Woonasquatucket River
054A	Sheridan Street	113.0 MGD	Combined Sewer Overflow	Woonasquatucket River
055A	Glenbridge Avenue	36.8 MGD	Combined Sewer Overflow	Woonasquatucket River
056A	Vandewater Street near Branch Avenue	31.0 MGD	Combined Sewer Overflow	Woonasquatucket River
058A	Wolcott Street	8.4 MGD	Combined Sewer Overflow	West River
061A	Dudley Street	135.7 MGD	Combined Sewer Overflow	Woonasquatucket River
067A	Diversions Structure Overflow	323 MGD	Combined Sewer Overflow	Providence River

E. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance of the sewer system shall be in compliance with the General Requirements of Part II and the following terms and conditions:

1. Maintenance Staff

The permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit.

2. Infiltration/Inflow

The permittee shall minimize infiltration/inflow to the sewer system. A summary report of all actions taken to minimize infiltration/inflow during the previous year shall be submitted to DEM, Office of Water Resources, by the 15th day of January each year.

3. Combined Sewer Overflows and Bypasses

The permittee shall operate and improve the sewer system to minimize the discharge of pollutants from combined sewer overflows and bypasses.

F. SLUDGE

The permittee shall conform and adhere to all conditions, practices and regulations as contained in the State of Rhode Island Rules and Regulations for the Treatment, Disposal, Utilization and Transportation of Sewage Sludge. The permittee shall comply with its DEM Order of Approval for the disposal of sludge.

G. DETECTION LIMITS

The permittee shall assure that all wastewater testing required by this permit, is performed in conformance with the method detection limits listed below (the EPA method is noted for reference, other EPA approved methods found in 40 CFR Part 136 may be utilized). All sludge testing required by this permit shall be in conformance with the method detection limits found in 40 CFR 503.8. In accordance with 40 CFR Part 136, EPA approved analysis techniques, quality assurance procedures and quality control procedures shall be followed for all reports required to be submitted under the RIPDES program. These procedures are described in "Methods for the Determination of Metals in Environmental Samples" (EPA/600/4-91/010) and "Methods for Chemical Analysis of Water and Wastes" (EPA/600/4-79/020).

The report entitled "Methods for the Determination of Metals in Environmental Samples" includes a test which must be performed in order to determine if matrix interferences are present, and a series of tests to enable reporting of sample results when interferences are identified. Each step of the series of tests becomes increasingly complex, concluding with the complete Method of Standard Additions analysis. The analysis need not continue once a result which meets the applicable quality control requirements has been obtained. Documentation of all steps conducted to identify and account for matrix interferences shall be submitted along with the monitoring reports.

If, after conducting the complete Method of Standard Additions analysis, the laboratory is unable to determine a valid result, the laboratory shall report "could not be analyzed". Documentation supporting this claim shall be submitted along with the monitoring report. If valid analytical results are repeatedly unobtainable, DEM may require that the permittee determine a method detection limit (MDL) for their effluent or sludge as outlined in 40 CFR Part 136, Appendix B.

When calculating sample averages for reporting on discharge monitoring reports (DMRs):

1. "could not be analyzed" data shall be excluded, and shall not be considered as failure to comply with the permit sampling requirements;
2. results reported as less than the MDL shall be reported as zero in accordance with the DEM's DMR Instructions, provided that all appropriate EPA approved methods were followed.

Therefore, all sample results shall be reported as: an actual value, "could not be analyzed", or zero. The effluent or sludge specific MDL must be calculated using the methods outlined in 40 CFR Part 136, Appendix B. Samples which have been diluted to ensure that the sample concentration will be within the linear dynamic range shall not be diluted to the extent that the analyte is not detected. If this should occur the analysis shall be repeated using a lower degree of dilution.

LIST OF TOXIC POLLUTANTS

The following list of toxic pollutants has been designated pursuant to Section 307(a)(1) of the Clean Water Act. The Method Detection Limits (MDLs) represent the required Rhode Island MDLs.

Volatiles - EPA Method 624		MDL ug/l (ppb)	Pesticides - EPA Method 608		MDL ug/l (ppb)
1V	acrolein	10.0	18P	PCB-1242	0.289
2V	acrylonitrile	5.0	19P	PCB-1254	0.298
3V	benzene	1.0	20P	PCB-1221	0.723
5V	bromoform	1.0	21P	PCB-1232	0.387
6V	carbon tetrachloride	1.0	22P	PCB-1248	0.283
7V	chlorobenzene	1.0	23P	PCB-1260	0.222
8V	chlorodibromomethane	1.0	24P	PCB-1016	0.494
9V	chloroethane	1.0	25P	toxaphene	1.670
10V	2-chloroethylvinyl ether	5.0			
11V	chloroform	1.0			
12V	dichlorobromomethane	1.0	Base/Neutral - EPA Method 625	MDL ug/l (ppb)	
14V	1,1-dichloroethane	1.0	1B	acenaphthene *	1.0
15V	1,2-dichloroethane	1.0	2B	acenaphthylene *	1.0
16V	1,1-dichloroethylene	1.0	3B	anthracene *	1.0
17V	1,2-dichloropropane	1.0	4B	benzidine	4.0
18V	1,3-dichloropropylene	1.0	5B	benzo(a)anthracene *	2.0
19V	ethylbenzene	1.0	6B	benzo(a)pyrene *	2.0
20V	methyl bromide	1.0	7B	3,4-benzofluoranthene *	1.0
21V	methyl chloride	1.0	8B	benzo(ghi)perylene *	2.0
22V	methylene chloride	1.0	9B	benzo(k)fluoranthene *	2.0
23V	1,1,2,2-tetrachloroethane	1.0	10B	bis(2-chloroethoxy)methane	2.0
24V	tetrachloroethylene	1.0	11B	bis(2-chloroethyl)ether	1.0
25V	toluene	1.0	12B	bis(2-chloroisopropyl)ether	1.0
26V	1,2-trans-dichloroethylene	1.0	13B	bis(2-ethylhexyl)phthalate	1.0
27V	1,1,1-trichloroethane	1.0	14B	4-bromophenyl phenyl ether	1.0
28V	1,1,2-trichloroethane	1.0	15B	butylbenzyl phthalate	1.0
29V	trichloroethylene	1.0	16B	2-chloronaphthalene	1.0
31V	vinyl chloride	1.0	17B	4-chlorophenyl phenyl ether	1.0
			18B	chrysene *	1.0
			19B	dibenzo (a,h)anthracene *	2.0
Acid Compounds - EPA Method 625	MDL ug/l (ppb)		20B	1,2-dichlorobenzene	1.0
1A	2-chlorophenol	1.0	21B	1,3-dichlorobenzene	1.0
2A	2,4-dichlorophenol	1.0	22B	1,4-dichlorobenzene	1.0
3A	2,4-dimethylphenol	1.0	23B	3,3'-dichlorobenzidine	2.0
4A	4,6-dinitro-o-cresol	1.0	24B	diethyl phthalate	1.0
5A	2,4-dinitrophenol	2.0	25B	dimethyl phthalate	1.0
6A	2-nitrophenol	1.0	26B	di-n-butyl phthalate	1.0
7A	4-nitrophenol	1.0	27B	2,4-dinitrotoluene	2.0
8A	p-chloro-m-cresol	2.0	28B	2,6-dinitrotoluene	2.0
9A	pentachlorophenol	1.0	29B	di-n-octyl phthalate	1.0
10A	phenol	1.0	30B	1,2-diphenylhydrazine (as azobenzene)	1.0
11A	2,4,6-trichlorophenol	1.0	31B	fluoranthene *	1.0
Pesticides - EPA Method 608	MDL ug/l (ppb)		32B	fluorene *	1.0
1P	aldrin	0.059	33B	hexachlorobenzene	1.0
2P	alpha-BHC	0.058	34B	hexachlorobutadiene	1.0
3P	beta-BHC	0.043	35B	hexachlorocyclopentadiene	2.0
4P	gamma-BHC	0.048	36B	hexachloroethane	1.0
5P	delta-BHC	0.034	37B	indeno(1,2,3-cd)pyrene *	2.0
6P	chlordan	0.211	38B	isophorone	1.0
7P	4,4'-DDT	0.251	39B	naphthalene *	1.0
8P	4,4'-DDE	0.049	40B	nitrobenzene	1.0
9P	4,4'-DDD	0.139	41B	N-nitrosodimethylamine	1.0
10P	dieldrin	0.082	42B	N-nitrosodi-n-propylamine	1.0
11P	alpha-endosulfan	0.031	43B	N-nitrosodiphenylamine	1.0
12P	beta-endosulfan	0.036	44B	phenanthrene *	1.0
13P	endosulfan sulfate	0.109	45B	pyrene *	1.0
14P	endrin	0.050	46B	1,2,4-trichlorobenzene	1.0
15P	endrin aldehyde	0.062			
16P	heptachlor	0.029			
17P	heptachlor epoxide	0.040			

OTHER TOXIC POLLUTANTS

	MDL ug/l (ppb)
Antimony, Total	3.0
Arsenic, Total	1.0
Beryllium, Total	0.2
Cadmium, Total	0.1
Chromium, Total	1.0
Chromium, Hexavalent***	20.0
Copper, Total	1.0
Lead, Total	1.0
Mercury, Total	0.001
Nickel, Total	1.0
Selenium, Total	2.0
Silver, Total	0.5
Thallium, Total	1.0
Zinc, Total	5.0
Asbestos	**
Cyanide, Total	10.0
Phenols, Total***	50.0
Aluminum, Total	5.0
TCDD	**
MTBE (Methyl Tert Butyl Ether)	1.0

* Polynuclear Aromatic Hydrocarbons

** No Rhode Island Department of Environmental Management (DEM) MDL

*** Not a priority pollutant as designated in the 1997 Water Quality Regulations (Table 5)

NOTE:

The MDL for a given analyte may vary with the type of sample. MDLs which are determined in reagent water may be lower than those determined in wastewater due to fewer matrix interferences. Wastewater is variable in composition and may therefore contain substances (interferents) that could affect MDLs for some analytes of interest. Variability in instrument performance can also lead to inconsistencies in determinations of MDLs.

To help verify the absence of matrix or chemical interference the analyst is required to complete specific quality control procedures. For the metals analyses listed above the analyst must withdraw from the sample two equal aliquots; to one aliquot add a known amount of analyte, and then dilute both to the same volume and analyze. The unspiked aliquot multiplied by the dilution factor should be compared to the original. Agreement of the results within 10% indicates the absence of interference. Comparison of the actual signal from the spiked aliquot to the expected response from the analyte in an aqueous standard should help confirm the finding from the dilution analysis. (Methods for Chemical Analysis of Water and Wastes EPA-600/4-79/020).

For Methods 624 and 625 the laboratory must on an ongoing basis, spike at least 5% of the samples from each sample site being monitored. For laboratories analyzing 1 to 20 samples per month, at least one spiked sample per month is required. The spike should be at the discharge permit limit or 1 to 5 times higher than the background concentration determined in Section 8.3.2, whichever concentration would be larger. (40 CFR Part 136 Appendix B Method 624 and 625 subparts 8.3.1 and 8.3.11).

H. MONITORING AND REPORTING

1. Monitoring

All monitoring required by this permit shall be done in accordance with sampling and analytical testing procedures specified in Federal Regulations (40 CFR Part 136).

2. Reporting

Unless otherwise specified in this permit, the permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

a. Submittal of DMRs Using NetDMR

The permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to DEM no later than the 15th day of the month electronically using NetDMR. When the permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to DEM.

b. Submittal of Reports as NetDMR Attachments

Unless otherwise specified in this permit, the permittee must submit electronic copies of documents in NetDMR that are directly related to the DMR. These include the following:

- DMR Cover Letters
- Below Detection Limit summary tables
- Wet Weather Event Summary Reports
- Monthly Operating Reports

All other reports (i.e. I/I reports, Bioassays, P/T reports, etc.) should be submitted to DEM hard copy via regular US mail (see Part I.F.4 below).

c. Submittal of Requests and Reports to DEM

The following requests, reports, and information described in this permit shall be submitted to the DEM.

- i. Transfer of Permit notice
- ii. Request for changes in sampling location
- iii. Request for reduction in testing frequency
- iv. Request for reduction in WET testing requirement
- v. Report on unacceptable dilution water / request for alternative dilution water for WET testing

These reports, information, and requests shall be submitted to DEM by hard copy mail to the following address:

Rhode Island Department of Environmental Management
RIPDES Program
235 Promenade Street
Providence, RI 02908

d. Submittal of Reports in Hard Copy Form

The following notifications and reports shall be submitted as hard copy with a cover letter describing the submission. These reports shall be signed and dated originals submitted to DEM.

- i. Written notifications required under Part II
- ii. Notice of unauthorized discharges, including Sanitary Sewer Overflow (SSO) reporting
- iii. Priority Pollutant Scan results
- iv. Toxicity Monitoring Reports
- v. Infiltration/Inflow Reports

This information shall be submitted to DEM at the following address:

Rhode Island Department of Environmental Management
RIPDES Program
235 Promenade Street
Providence, Rhode Island 02908

e. Verbal Reports and Verbal Notifications

Any verbal reports or verbal notifications, if required in Parts I and/or II of this permit, shall be made to the DEM. This includes verbal reports and notifications which require reporting within 24 hours. (See Part II(1)(5) General Requirements for 24-hour reporting) Verbal reports and verbal notifications shall be made to DEM at (401) 222-4700 or (401) 222-3070 at night.

3. Fixed Site Monitoring and Reporting

The permittee shall continue as a partner in the Narragansett Bay Fixed Site Monitoring Network (NBFSMN) by continuing to seasonally operate and maintain instruments capable of collecting near surface and near bottom measurements of temperature, salinity, chlorophyll and dissolved oxygen on a continuous basis (usually every fifteen minutes, except when down for maintenance/repair) at Bullocks Point Reach and Seekonk River/Phillipsdale and by collecting and reporting data in accordance with the NBFSMN Seasonal Monitoring Quality Assurance Project Plan 2014, as amended.

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
235 PROMENADE STREET
PROVIDENCE, RHODE ISLAND 02908-5767

FACT SHEET

RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM (RIPDES) PERMIT TO DISCHARGE TO WATERS OF THE STATE

RIPDES PERMIT NO. **RI0100315**

NAME AND ADDRESS OF APPLICANT:

The Narragansett Bay Commission
One Service Road
Providence, RI 02905

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Field's Point Wastewater Treatment Facility
2 Ernest Street
Providence, RI 02905
and
associated Combined Sewer Overflows (CSOs)

RECEIVING WATERS: **Providence River, Water Body ID# RI0007020E-01B (Field's Point WWTF)**
Seekonk River, Water Body ID# RI0007019E-01 (CSO Outfalls)
Moshassuck River, Water Body ID# RI0003008R-01 (CSO Outfalls)
West River, Water Body ID# RI0003008R-03C (CSO Outfalls) and
Woonasquatucket River, Water Body ID#RI0002007R-10D (CSO Outfalls)

CLASSIFICATION: **SB1 {a} (Providence and Seekonk Rivers); B1{a} (Woonasquatucket River) & B{a} (Moshassuck and West Rivers)**

I. Proposed Action, Type of Facility, and Discharge Location

The above-named applicant has applied to the Rhode Island Department of Environmental Management (DEM) for reissuance of a RIPDES Permit to discharge into the designated receiving water. The facility is engaged in the treatment of domestic and industrial sewage. The discharge is from the Field's Point Wastewater Treatment Facility and the Combined Sewer Overflows associated with the wastewater treatment facility's collection system. Site layout and process diagrams of the facility are shown in Figs. 1a and 1b.

II. Description of Discharge

A quantitative description of the discharge in terms of significant effluent parameters based on DMR data from July 2009 through June 2014 is shown on Attachment A-2.

III. Permit Limitations and Conditions

The final effluent limitations and monitoring requirements may be found in the draft permit. The NBC is currently subject to Consent Agreement RIA-330, which establishes a compliance schedule for the facility to complete construction of its combined sewer overflow Long Term Control Plan (LTCP) and to comply with its final permit limits for Total Copper and Cyanide.

The DEM anticipates continuing this consent agreement in order to maintain the compliance schedule for the NBC to comply with its CSO requirements. In addition, the DEM anticipates including a schedule for the NBC to implement the web-based CSO public notification process from Part I.D.4 of the permit. In terms of toxic pollutants, DEM does not anticipate continuing interim limits for Total Copper and Cyanide. However, the DEM is willing to enter into a new consent agreement schedule for the NBC to evaluate its ability to comply with its new Enterococci and TRC limits for outfall 002. The NBC was also previously subject to Consent Agreement RIA-371 which established a Total Nitrogen compliance schedule. However, the NBC has completed construction of the upgrades necessary to meet and has been complying with its final Total Nitrogen limits. Therefore, a Consent Agreement for the Total Nitrogen limits will not be required.

IV. **Permit Basis and Explanation of Effluent Limitation Derivation**

Facility Description

The Narragansett Bay Commission (NBC) owns and operates the Field's Point Wastewater Treatment Facility (WWTF) located on Ernest Street in Providence, Rhode Island and several associated Combined Sewer Overflows (CSOs). The Field's Point facility services the communities of Johnston, Providence, North Providence, and portions of Lincoln and Cranston. As of March 2016, the date of the facility's most recent annual report, there were thirty-nine (39) Significant Industrial Users contributing wastewater to the Field's Point WWTF. The discharge from the WWTF to the Providence River consists of treated sanitary sewage and treated commercial and industrial wastewater. Treatment consists of Screening, Grit Removal, Pre-aeration, Primary Settling, Advanced Activated Sludge Treatment, Secondary Settling, Chlorination, and Dechlorination.

From the effective date of this permit, the permittee is authorized to discharge from the CSOs associated with the Field's Point WWTF, as listed in this permit, provided that the discharge complies with the EPA CSO Policy and that discharges receive treatment at a level providing Best Practicable Control Technology Currently Available (BPT), Best Conventional Pollutant Control Technology (BCT) to control and abate conventional pollutants, and Best Available Technology Economically Achievable (BAT) to control and abate non-conventional and toxic pollutants.

NBC Field's Point's most recent RIPDES permit, authorizing discharges from the above-mentioned facilities, was issued on December 31, 2001. This permit became effective on February 1, 2002, and expired on February 1, 2007. The facility submitted an application for permit reissuance to the DEM on August 2, 2006. On August 7, 2006, the DEM issued an application complete letter to the facility. In accordance with Rule 13(a) of the Regulations for the Rhode Island Pollutant Discharge Elimination System, the facility's December 31, 2001 RIPDES permit remains in effect since the DEM has determined that a timely and complete permit application was submitted. Once this permit is reissued, it will supersede the December 31, 2001 permit.

Receiving Water Description

The water bodies that receive the discharge from the Field's Point WWTF and its associated CSOs are the Providence, Seekonk, Moshassuck, West, and Woonasquatucket Rivers.

The water body segment for the Providence River is RI0007020E-01B and is located in East Providence, Providence, Warwick, and Cranston. This segment is delineated by the Providence River from its confluence with the Moshassuck and Woonasquatucket Rivers in Providence and south of a line from India Point to Bold Point (across the mouth of the Seekonk River), to a line extending from a point on shore due east of Naushon Avenue in Warwick to the western terminus of beach Road in East Providence, including Watchemoket Cove. This segment of the Providence River is listed on DEM's 2012 303(d) List of Impaired Water Bodies as being impaired for Fish and Wildlife Habitat due to Nitrogen and Dissolved Oxygen, and it is impaired for Primary

and Secondary Contact Recreation for Fecal Coliform. The waterbody segment for the Seekonk River is RI0007019E-01 and is located in Pawtucket, Providence, and East Providence. This water body segment is delineated by Slater Mill Dam at Main Street in Pawtucket and India Point in Providence. This segment of the Seekonk River is listed on DEM's 2012 303(d) List of Impaired Water Bodies as being impaired for Fish and Wildlife habitat due to Nitrogen and Dissolved Oxygen, and it is impaired for Primary and Secondary Contact Recreation for Fecal Coliform. The water body segments for the Providence and Seekonk Rivers are classified as SB1{a} water bodies according to the Rhode Island Water Quality Regulations. Class SB1{a} waters are designated for primary and secondary contact recreational activities and fish and wildlife habitat. They shall be suitable for aquacultural uses, navigation, and industrial cooling. Class SB1{a} waters shall have good aesthetic value. Primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges. However, all Class SB criteria must be met. These waters will likely be impacted by combined sewer overflows in accordance with approved CSO Facilities Plans and in compliance with rule 19.E.1 of the Rhode Island Water Quality Regulations and the Rhode Island CSO Policy. Therefore, primary contact recreational activities; shellfishing uses; and fish and wildlife habitat will likely be restricted.

The water body segment for the Moshassuck River is RI0003008R-01C, and is located in Central Falls, Pawtucket, and Providence. This water body segment is delineated by the first CSO discharge point at Weeden Street Bridge and the confluence of the Moshassuck River with the Woonasquatucket River. This segment of the Moshassuck River is listed on DEM's 2012 303(d) List of Impaired Water Bodies as being impaired for Fish and Wildlife habitat for Benthic-Macroinvertebrate Bioassessments, and it is also impaired for primary and secondary contact recreation for Enterococcus. The water body segment for the West River is RI0003008R-03C, and is located in Providence. This water body segment is delineated by the first CSO discharge point located south of the Branch Avenue crossing, off of Vandewater Street and the confluence with the Moshassuck River. This segment of the West River is listed on DEM's 2012 303(d) List of Impaired Water Bodies as being impaired for Fish and Wildlife habitat for Benthic-Macroinvertebrate Bioassessments, and it is also impaired for primary and secondary contact recreation for Enterococcus. The water body segments for the Moshassuck River and West River are classified as class B{a} water bodies according to the Rhode Island Water Quality Regulations. Class B{a} waters are designated for fish and wildlife habitat and primary and secondary contact recreational activities. Class B{a} waters shall be suitable for compatible industrial processes and cooling, hydropower, aquacultural uses, navigation, and irrigation and other agricultural uses. Class B{a} waters shall have good aesthetic value. These waters will likely be impacted by combined sewer overflows in accordance with approved CSO Facilities Plans and in compliance with rule 19.E.1 of the Rhode Island Water Quality Regulations and the Rhode Island CSO Policy. Therefore, primary contact recreational activities; shellfishing uses; and fish and wildlife habitat will likely be restricted.

The water body segment for the Woonasquatucket River is RI0002007R-10D, and is located in Providence. This water body segment is delineated by the CSO outfall at Glenbridge Avenue to the confluence with the Moshassuck River. This segment of the Woonasquatucket River is listed on DEM's 2012 303(d) List of Impaired Water Bodies as being impaired fish and wildlife habitat due to Copper, Dioxin, Lead, Mercury, Non-Native Aquatic Plants, Dissolved Oxygen, Polychlorinated biphenyls, Zinc, and Benthic-Macroinvertebrate Bioassessments. This is also impaired for fish consumption due to Dioxin, and due to Mercury and PCB in Fish Tissue. This segment is also impaired for primary contact recreation due to Enterococcus. This segment of the Woonasquatucket River is classified as B1{a} according to the Rhode Island Water Quality Regulations. Class B1{a} waters are designated for primary and secondary contact recreational activities and fish and wildlife habitat. They shall be suitable for compatible industrial processes and cooling, hydropower, aquacultural uses, navigation, and irrigation and other agricultural uses. These waters shall have good aesthetic value. Primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges. These waters will likely be impacted by combined sewer overflows in accordance with approved CSO Facilities Plans and in compliance with rule 19.E.1 of the Rhode Island Water Quality Regulations and the Rhode Island

CSO Policy. Therefore, primary contact recreational activities; shellfishing uses; and fish and wildlife habitat will likely be restricted.

Permit Limit Development

The requirements set forth in this permit are from the State's Water Quality Regulations and the State's Regulations for the Rhode Island Pollutant Discharge Elimination System, both filed pursuant to RIGL Chapter 46-12, as amended. DEM's primary authority over the permit comes from EPA's delegation of the program in September 1984 under the Clean Water Act (CWA).

Development of RIPDES permit limitations is a multi-step process consisting of: determining if Federal effluent guidelines apply; calculation of allowable water quality-based discharge levels based on background data and available dilution; assigning appropriate Best Professional Judgment (BPJ) limits; comparing existing and proposed limits; comparing discharge data to proposed limits; performing an antidegradation/antibacksliding analysis to determine the final permit limits; and developing interim limits as appropriate.

Water quality criteria are comprised of numeric and narrative criteria. Numeric criteria are scientifically derived ambient concentrations developed by EPA or State for various pollutants of concern to protect human health and aquatic life. Narrative criteria are statements that describe the desired water quality goal. A technology-based limit is a numeric limit, which is determined by examining the capability of a treatment process to reduce or eliminate pollutants.

WWTF Conventional Pollutant Permit Limitations

CBOD₅, TSS, and pH

The November-April "Average Monthly" and "Average Weekly" Carbonaceous Biochemical Oxygen Demand (CBOD₅) and Total Suspended Solids (TSS) concentration-based limitations plus the year-round pH limitations are based upon the secondary treatment requirements of Section 301 (b)(1)(B) of the CWA as defined in 40 CFR 133.102 (a) - (c). The November-April "Maximum Daily" CBOD₅ and TSS concentration-based limits are based on Rhode Island requirements for Publicly Owned Treatment Works (POTW's) under Section 401 (a)(1) of the CWA and in 40 CFR 124.53 and 124.56.

The May-October "Average Monthly", "Average Weekly", and "Daily Maximum" CBOD₅ and TSS limits are set at levels more stringent than those called out in 40 CFR 133.102 (a)-(c) due to increased pollutant removals that will be achieved from the operation of nutrient removal equipment. These limits are more stringent than those from the previous permit. However, based upon a review of the NBC's historic data since the nutrient removal upgrades were placed on-line it has been determined that the NBC can meet these new limits.

The mass-based (i.e. lb/day) CBOD₅ and TSS limits were calculated using the above-mentioned concentration-based limits in mg/L, the WWTF's monthly average design flow in MGD, and the appropriate conversion factor of 8.34 lbs/gallon. All of the mass-based limits were at least as stringent as those from the previous permit. Based upon a review of the NBC's historic data since the nutrient removal upgrades were placed on-line it has been determined that the NBC can meet these new limits.

Oil and Grease

Oil and Grease limits have been included to ensure that the WWTF's collection system will not experience blockages due to excessive levels of grease and to ensure that the WWTF will not experience inhibition. Monitoring data will serve as an indicator of excessive levels of Oil and Grease in the collection system that is typically attributed to restaurants and other sources of Oil and Grease loading which discharge to the sewer collection system. NBC and DEM will be able

to use this data to track and potentially initiate corrective action if necessary to prevent backups and blockages within the sewer collection system.

Settleable Solids

Settleable Solids monitoring has been included as a process-control parameter that can aid in the assessment of the operation of the plant but need not have an effluent limit.

CBOD₅ and TSS % Removal

The "Percent Removal" requirements for CBOD₅ and TSS are in accordance with 40 CFR 133.102(a) and (b) respectively.

Bacteria

Table 2.8.D(3) of the Rhode Island Water Quality Regulations includes Enterococci criteria for primary contact/swimming of a geometric mean of 35 colonies/100 ml and a single sample maximum of 104 colonies/100 ml. However, the "single sample maximum" value is only used by the Rhode Island Department of Health to evaluate swimming advisories at public beaches and is not applied to the receiving water in the area of the Field's Point WWTF outfall. EPA's November 12, 2008 memorandum regarding "Initial Zones of Dilution for Bacteria in Rivers and Streams Designated for Primary Contact Recreation" specifies that it is not appropriate to use dilution for bacteria criteria in receiving waters that are designated for primary contact recreation. Therefore, because the receiving water is designated for primary contact recreation, the DEM has assigned a monthly average Enterococci limit of 35 colonies/100 ml for outfall 001A. This limit is consistent with the water quality criteria from Table 2.8.D(3) of the Rhode Island Water Quality Regulations. The daily maximum Enterococci limit has been set at the 90% upper confidence level value for "lightly used full body contact recreation" of 276 colonies/100 ml. The DEM has also assigned Fecal Coliform monitoring to ensure that the discharge from the WWTF will not have an impact on any areas designated for shellfish harvesting outside of the immediate vicinity of the outfall.

WWTF Toxic Pollutant Limits

Water Quality-Based Limit Calculations

The allowable effluent limitations were established on the basis of acute and chronic aquatic life criteria and human health criteria using the following: available instream dilution; an allocation factor; and background concentrations when available and/or appropriate. The aquatic life and human health criteria are specified in the Rhode Island Water Quality Regulations. Aquatic life criteria have been established to ensure the protection and propagation of aquatic life while human health criteria represent the pollutant levels that would not result in a significant risk to public health from ingestion of aquatic organisms. The more stringent of the two criteria was then used in establishing allowable effluent limitations. Details concerning the calculation of potential permit limitations, selection of factors, which influence their calculation, and the selection of final permit limitations are included below or in the attached documents. The NBC Field's Point 2001 permit also contained water quality-based limits.

Mixing Zones and Dilution Factors

The basis for the mixing zones and corresponding dilution factors for the Field's Point Wastewater Treatment Facility is presented in the 1992 permit's Fact Sheet, dated May 1, 1992 which established a chronic dilution factor of 20 and an acute dilution factor of 5. These dilution factors are based on a dye study from August of 1989. The WWTF's effluent is discharged through a 7' x 7' pipe. The acute mixing zone is a semi-circle with a radius of 450 feet, while the chronic mixing zone is 550 feet wide and extends from a point 550 feet upstream of the outfall to the eastern most location on Field's Point to the US Coast Guard Green Can Buoy number 43 to the southern most tip of Field's point. Additional information regarding the Field's Point mixing

zones can be found in the May 1992 Fact Sheet, which is on file at the DEM. Provided in Figure 2 are maps detailing the location of the outfall and the acute and chronic mixing zones.

Using the above dilution factors, the allowable discharge limits were calculated as follows:

- a) Background concentration unknown or available data is impacted by sources that have not yet achieved water quality based limits.

$$Limit_1 = (DF) * (Criteria) * (80\%)$$

Where: DF = acute or chronic dilution factor, as appropriate

Note: The right side of the above-referenced formula is divided by the appropriate metals translator when this formula is used to calculate limits for metals.

- b) Using available background concentration data¹

$$Limit_1 = (DF) * (Criteria) * 90\% - (Background) * (DF - 1)$$

Where: DF = acute or chronic dilution factor, as appropriate

Note: The right side of the above-referenced formula is divided by the appropriate metals translator when this formula is used to calculate limits for metals.

Since background concentrations were available for Arsenic, Cadmium, Chromium VI, Copper, Lead, Mercury, Nickel, Selenium, Silver, and Zinc, 90% of criteria was allocated for these pollutants. All other limits were calculated using 80% allocation, due to a lack of background data.

The formulas and data noted above were applied with the following exceptions:

- A) Pollutants that based on the acute and chronic dilution factors have a higher allowable chronic limit than allowable acute limit. For this situation, both the "Monthly Average" and "Daily Maximum" limits were set at the allowable acute limit.
- B) Total residual chlorine. The limits for total residual chlorine (TRC) were established in accordance with the DEM Effluent Disinfection Policy. The "Monthly Average" and "Daily Maximum" were based on a 100% allocation, a zero background concentration, and the appropriate dilution factor(s). The 100% allocation factor for TRC was used due to the non-conservative nature of chlorine and the improbability of the receiving water having a detectable background TRC concentration.
- C) Pollutants with water quality based monthly average limits in the previous RIPDES permit. The relaxation of monthly average limits from the previous permit was restricted in accordance with the antibacksliding provisions of the Clean Water Act and the Policy on the Implementation of the Antidegradation Provisions of the Rhode Island Water Quality Regulations.

The potential ammonia limitations were derived from acute and chronic water quality criteria for saltwater from the Rhode Island Water Quality Regulations, which are based upon salinity, pH, and temperature. A salinity equal to 20 ppt., pH equal to 7.8 standard units, and average temperatures equal to 25°C and 5°C during Summer and Winter seasons, respectively, were used to calculate the allowable water quality-based discharge levels for ammonia.

¹Source of background data for Arsenic, Cadmium, Chromium VI, Copper, Lead, Mercury, Nickel, Selenium, Silver, and Zinc is Table 3-10 from the Army Corps of Engineers' and EPA's "Draft Environmental Impact Statement for the Rhode Island Region Long-Term Dredged Material Disposal Site" 2004 OCLC # 71790716 with corrections made to the average concentrations to account for arithmetic errors as noted in file correspondence between the NBC and RIDEM.

Metals Translators

On September 30, 2004, the NBC submitted a Final Metals Compliance Evaluation Report to the DEM as required under consent agreement RIA-330. This Final Metals Compliance Evaluation Report included the results of the NBC's metals translator study. Water quality criteria for metals are applicable to the dissolved form. A translator study is performed to evaluate the degree to which particulate metals will become dissolved (i.e. translate into dissolved) once discharged into the environment. Several factors, can affect this process and DEM reviewed the metals translator study to determine if the data had any seasonal, tidal, and/or spatial (transects) variability.

Based on this analysis, the DEM determined that the most appropriate metals translator data set to use is the data from the October 2001 surveys. This data set was selected since more of the particulate metals became dissolved than it did during the other surveys (i.e. the translators calculated from this survey were consistently higher). Therefore, it was determined that translators from this survey will ensure that the dissolved metals criteria are met during all seasons. Further after evaluation of the translators at various transects and tides, it was determined that there is not significant variability caused by tides and transects. As a result, the DEM determined that the appropriate translators to use are the ones calculated from the October 2001 survey. The following table is a summary of the final metals translator values for the Providence and Seekonk Rivers after including a 5% margin of safety. Note: After incorporating a 5% margin of safety into the Providence River's nickel translator the value was greater than 1.0, therefore, this translator was set equal to 1.0.

Table 1: Final Metals Translators for Each River (ug/L)

River	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
	Cadmium	Copper	Lead	Nickel	Silver
Providence	0.935	0.818	0.217	1.000	0.420
Seekonk	0.952	0.670	0.138	0.947	0.489

Since the discharge from the Fields Point facility does not enter the Seekonk River, the DEM has determined that it is appropriate to assign the translators calculated for the Providence River to the Fields Point facility. The following table includes the final translators that were assigned in the permit:

Table 2: Final Metals Translators for the Wastewater Treatment Facility (WWTF)

WWTF	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
	Cadmium	Copper	Lead	Nickel	Silver
Fields Point	0.935	0.818	0.217	1.000	0.420

A report on the DEM's review of the NBC's metals translator study can be found in Attachment A-3.

Reference Attachment A-4 for calculations of allowable limits based on the Aquatic Life and Human Health Criteria from the Rhode Island Water Quality Regulations.

Antibacksliding

Antibacksliding restricts the level of relaxation of water quality based limits from the previous permit. Section 303(d)(4) of the Clean Water Act addresses antibacksliding as the following:

Section 303(d)(4)

- A) Standards not attained - For receiving waters that have not attained the applicable water quality standards, limits based on a TMDL or WLA can only be revised if the water quality standards will be met. This may be done by (i) determining that the cumulative effect of all such revised limits would assure the attainment of such water quality standards; or (ii) removing the designated use which is not being attained in accordance with regulations under Section 303.
- B) Standards attained - For receiving waters achieving or exceeding applicable water quality standards, limits can be relaxed if the revision is consistent with the State's Antidegradation Policy.

Therefore, in order to determine whether the relaxation of a permit limit is permissible, the first question that must be answered is whether or not the receiving water is attaining the water quality standard for that particular pollutant. The DEM has determined that the most appropriate method of evaluating existing water quality is to calculate the pollutant levels, which would result after consideration of all currently valid RIPDES permit limits or historic discharge data (whichever is greater), background data (when available), and any new information (i.e.: dilution factors).

Antidegradation

The DEM document entitled "Policy on the Implementation of the Antidegradation Provisions of the Rhode Island Water Quality Regulations" (the Policy) from Appendix C of the Rhode Island Water Quality Regulations establishes four tiers of water quality protection:

In terms of a RIPDES permit, an increased discharge is defined as an increase in any limitation, which would result in an increased mass loading to a receiving water. The baseline for this comparison would be the monthly average mass loading established by the previous permit. It would be inappropriate to use the daily maximum mass loading since the Policy is not applicable to short-term changes in water quality.

For the purposes of ensuring that the revised limit is consistent with the requirements of antidegradation, existing water quality must be defined. As explained earlier, DEM evaluates existing water quality by determining the pollutant levels which would result under the design conditions appropriate for the particular criteria (i.e., background water quality, when available and/or appropriate; non-point source inputs; and existing RIPDES permit limitations or recent historical discharge data, whichever is higher). In general, available data would be used to make this determination.

Using the above-mentioned criteria, the present instream water quality C_p is defined as:

$$C_p = \frac{(DF - 1) * C_b + (1 * C_d)}{DF}$$

where: C_b = background concentration²
 C_d = discharge data³

²Source of background data for Arsenic, Cadmium, Chromium VI, Copper, Lead, Mercury, Nickel, Selenium, Silver, and Zinc is Table 3-10 from the Army Corps of Engineers' and EPA's "Draft Environmental Impact Statement for the Rhode Island Region Long-Term Dredged Material Disposal Site" 2004 OCLC # 71790716

³Discharge data refers to the maximum of the permit limit or the historic discharge level. The historic discharge level is determined by calculating the upper 95th percent confidence interval for the monthly average reported data for the past five (5) years. For specific cases, changes in treatment efficiency or pretreatment limitations may support the use of an

DF = dilution factor

If the waterbody is a high quality water for the pollutant in question ($C_p < C_{criteria}$), then the discharge requires an evaluation under Tier 2 protection. If the waterbody is not determined to be high quality for that parameter, then antibacksliding will allow an increased permit limit only if it can be assured that water quality standards would be attained. Therefore, the permit limit would be calculated to comply with Tier 1 protection, using the procedures noted previously (i.e., Limit₁).

Assuming the receiving water has been designated as a high quality waterbody for the parameter under investigation, the next step is to determine whether the new or increased discharge is permissible and if so whether an important benefits demonstration is required. For existing discharges DEM shall follow the general rule of allocating no more than 20% of the remaining assimilative capacity without the need to complete an important benefits demonstration (assuming the receiving water is not an SRPW or ONRW). On a case-by-case basis, the DEM may limit the allocation or determine that any incremental loss or impact to the receiving water is significant enough to require a detailed important benefits demonstration.

Water Quality Based Limits - Considering Antibacksliding and Antidegradation

The receiving stream was determined to be a high quality water for Copper, Nickel, Mercury, and Zinc. As a result, DEM used the following four (4) steps to establish permit limitations for these parameters to be consistent with Tier 2 protection of antidegradation. Antidegradation analysis was not necessary for Silver, due to the fact that Rhode Island does not have chronic saltwater criteria for Silver.

- 1) Determine the remaining assimilative capacity of the receiving water C_{rac} . The remaining assimilative capacity (or buffer) is equivalent to the difference between the criteria and the calculated present instream water quality concentrations:

$$C_{rac} = C_{criteria} - C_p$$

where: $C_{criteria}$ = applicable standard for the most sensitive use; and
 C_p = the calculated present water quality concentration.

- 2) Establish the percentage of the remaining assimilative capacity that will be allocated to the permittee.

DEM allocated 20% of the remaining assimilative capacity for Copper. The decision to allocate 20% of the remaining assimilative capacity included but was not limited to the following factors: the Operation and Maintenance (O&M) of the facility being consistently rated highly, evolution of the facilities industrial pretreatment program and a review of historic discharge data. DEM allocated 0% of the remaining assimilative capacity for Nickel, Mercury, and Zinc. The decision to allocate 0% of the remaining assimilative capacity was based on the fact that the historical discharge concentration was well below the previous permit limit. Therefore, there was no reason to allocate any additional assimilative capacity of the receiving water.

- 3) Calculate an increased permit limit that would meet the Antidegradation Implementation Policy.

The next step is to calculate a permit limit based on the available concentration. Basically, the available concentration is a percentage of the remaining assimilative capacity of the receiving water, which can be allocated to the permittee, plus the present

water quality. This concentration is then used to calculate a permit limit. The limit is calculated by subtracting background data (if available or appropriate) from the criteria and using the appropriate dilution factors and allocation factors in a mass balanced relationship.

The limit is determined by:

$$Limit_2 = (C_p + \% * C_{rac}) * DF - (DF - 1) * C_b$$

- 4) Finally, compare Limit₁ to Limit₂.

The final limit is the minimum of Limit₁ and Limit₂.

Provided in Attachments A-5 and A-6 are calculations determining the historic discharge level and illustrating the antibracksliding/antidegradation evaluation, respectively.

Reasonable Potential

In accordance with 40 CFR 122.4(d)(1)(i), it is only necessary to establish permit limits for those pollutants in the discharge which have the reasonable potential to cause or contribute to the exceedance of instream criteria. In order to evaluate the need for permit limits, the most stringent calculated acute and chronic limits are compared to the Discharge Monitoring Report (DMR) and the State User Fee Program data. A complete listing of any pollutants detected from State User Fee Program data for the period July 2007 through November 2011 and a summary of the DMR data for the period July 2009 through June 2014 are provided in Attachments A-7 and A-8 respectively. Note: The User Fee Program sampling was discontinued after the 2011 sampling event. Attachment A-9 is a summary comparison of the allowable water quality-based limits vs. the DMR and State User Fee Program data. An assessment was made to determine if limits were necessary for any pollutants that had water quality criteria using the data collected during the previous five years. Based on these comparisons, water quality limitations for outfall 001 have been deemed necessary for Chlorine, Total Copper, Total Nickel, and Cyanide. In addition, since NBC recently began accepting flows from an industrial user that has elevated levels of arsenic, it was determined that water quality limits are necessary for Total Arsenic. Although these pollutants did not have "reasonable potential", monthly monitoring for Total Ammonia, Total Zinc, Total Cadmium, Total Aluminum, Chromium (VI), and Total Lead have been included in the permit since these pollutants are part of the standard list of pollutants monitored as part of the quarterly bioassay testing.

WWTF Nonconventional Pollutant Limits

BPJ-Based Permit Limits for Nutrients

The Providence and Seekonk Rivers are impacted by low Dissolved Oxygen (DO) levels and high phytoplankton concentrations that are related to excessive nitrogen loadings. Significant areas of the Providence and Seekonk Rivers suffer from hypoxic (low DO) and anoxic (lack of DO) conditions and violate water quality standards. Available data shows that nitrogen loads are dominated by wastewater treatment facility inputs.

DEM hired a consultant and has been working with a technical advisory committee (TAC), consisting primarily of scientists and engineers representing, academic, municipal, state and federal organizations, to calibrate a model and develop a water quality restoration plan, or TMDL. It was concluded that the hydrodynamic model formulation could not adequately simulate conditions due to the relatively severe changes in the bathymetry in the Providence River. Therefore, the DEM has concluded that the best method available for evaluating impacts and

setting nitrogen load reduction targets for the Providence River is to use the set of empirical relations developed from the Marine Ecosystems Research Laboratory (MERL) enrichment gradient studies at the University of Rhode Island.

In February 2004, DEM developed an analysis titled "Evaluation of Nitrogen Targets and WWTF Load Reductions for the Providence and Seekonk Rivers". This analysis indicated that wastewater treatment facility (WWTF) discharges are required to be reduced to the limit of technology (total nitrogen of 3 mg/l), but that the Seekonk River and portions of the Providence River may not fully comply with existing water quality standards for dissolved oxygen. DEM has evaluated the implementation costs, the performance of available technology, and estimates of water quality improvement to develop a phased plan for implementation of WWTF improvements at MA and RI WWTFs which maximizes the DO levels relative to implementation cost. Estimates of capital costs to modify existing facilities to achieve the target levels on a seasonal basis were developed. These costs included allowances for planning, design, construction and administration and must be considered Order-of-Magnitude estimates, since specific facility characteristics were not evaluated.

DEM issued permit modification to the appropriate WWTFs in June of 2005 that established seasonal (May – October) limits for total nitrogen. These limits, in combination with the reductions being assigned to the other WWTFs, will achieve a 50% reduction from the 1995-1996 Rhode Island WWTF loading, consistent with the recommendations from The Governor's Narragansett Bay and Watershed Planning Commission. In particular, on June 27, 2005, DEM issued the NBC a permit modification which added a seasonal Total Nitrogen limit of 5.0 mg/l, and required that the permittee operate the treatment facility to reduce the discharge of total nitrogen, during the months of November through April, to the maximum extent possible using all available treatment equipment in place at the facility. Assigning seasonal total nitrogen limits and requiring that the WWTF be operated year round in a manner to reduce the discharge of nitrogen to the maximum extent possible will result in substantial progress towards the mitigation of hypoxic/anoxic events and meeting water quality standards. The analysis contained in "Evaluation of Nitrogen Targets and WWTF Load Reductions for the Providence and Seekonk Rivers", indicates that the contribution of Massachusetts WWTFs is significant and, therefore, the DEM is also working with the Massachusetts Department of Environmental Protection and the EPA to pursue appropriate nitrogen reductions for these WWTFs. An integral component of the phased plan is a water quality reassessment that will evaluate the water quality improvements achieved after the WWTF upgrades have been completed and will determine the need for further reductions. In addition, several researchers are currently developing water quality models that DEM will evaluate to determine their utility towards evaluating the need for further reductions.

The permit maintains the Total Nitrogen permit limits and the nutrient monitoring frequencies first implemented in the 2005 permit modification. The DEM will continue to evaluate water quality improvements that result from the implementation of these nutrient limits.

Bioassay Testing

DEM's toxicity permitting policy is based on past toxicity data and the level of available dilution. Evaluation of the data collected for the past five years for biotoxicity revealed that the effluent samples demonstrated acceptable toxicity values for the Mysid (shrimp) tests and for the Arbacia (Sea Urchin) tests. Based upon the past toxicity results and available dilution, the draft permit requires an $LC_{50} \geq 100\%$ effluent limit for quarterly acute tests conducted on Mysids. At this point in time a chronic toxicity effluent limit has not been established. However, chronic toxicity testing for Arbacia is required for monitoring and performance purposes. DEM's toxicity permitting policy requires that acute toxicity be evaluated for effluents with dilutions between 20:1 and 100:1. Therefore, the permit requires that an acute toxicity test be conducted once per quarter on Mysids. The permit contains an acute $LC_{50} \geq 100\%$ effluent limit that shall assure control of the toxicity in the effluent. If recurrent toxicity is demonstrated, then toxicity identification and reduction will be required.

Wet Weather Limits

As indicated above, NBC's sewer collection system consists of combined sewers that convey both sanitary sewage and stormwater runoff during rain events. During wet weather, the combined flow may exceed the capacity of the WWTF and the interceptor sewers, and a portion of the combined flow is discharged to the receiving waters through the CSO facilities.

CSOs are point sources subject to RIPDES permit requirements for both water-quality based and technology-based requirements but are not subject to the secondary treatment regulations applicable to publicly owned treatment works in accordance with 40 CFR §133.103(a). Section 301(b)(1)(C) of the Clean Water Act mandated compliance with water quality standards by July 1, 1977. Technology-based permit limits must be established for best conventional pollutant control technology (BCT) and best available technology economically achievable (BAT) based on best professional judgment (BPJ) in accordance with Section 301(b) and Section 402(a) of the Clean Water Act.

The framework for compliance with Clean Water Act requirements for CSOs is set forth in EPA's National CSO Control Policy, 59 Fed. Reg. 18688 (1994). It sets the following objectives:

- 1) To ensure that if the CSO discharges occur, they are only as a result of wet weather;
- 2) To bring all wet weather CSO discharge points into compliance with the technology based requirements of the CWA and applicable federal and state water quality standards; and
- 3) To minimize water quality, aquatic biota, and human health impacts from wet weather flows.

The CSO Control Policy also established as a matter of national policy the minimum BCT/BAT controls that represent the BPJ of the agency on a consistent, national basis. These are the "nine minimum controls" defined in the CSO Control Policy and set forth in the Part I.B of the Permit. The nine minimum controls include: (1) proper operation and maintenance of the sewer system and the CSOs, (2) maximum use of the collection system for storage, (3) review pretreatment programs to assure that CSO impacts are minimized, (4) maximization of flow to the POTW for treatment, (5) prohibition of dry weather overflows, (6) control of solid and floatable materials in CSOs, (7) pollution prevention programs, (8) public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts, and (9) monitoring to effectively characterize CSO impacts and the efficacy of CSO controls. In accordance with the National CSO Control Policy and consistent with the conditions in the previous permit, the draft permit contains conditions that ensure that NBC complies with the nine minimum controls.

In addition, on July 12, 1999 DEM approved the NBC's three phase CSO long-term control plan, also known as the NBC's Concept Design Report Amendment (CDRA). The CDRA evaluated a range of CSO control alternatives and the approved alternative reduces CSO discharges primarily by the construction of deep rock tunnels to store CSO flow for treatment at the Fields and Bucklin Point WWTFs. Flows receive full advanced secondary treatment until the capacity of the tunnel is exceeded at which point wet weather flows beyond the capacity of the WWTF will be directed to the tunnel for storage. Since the WWTFs had excess primary treatment capacity, the approved CDRA also includes primary treatment and disinfection of wet weather flows when the storage capacity of the tunnel is exceeded or when necessary to create capacity in the tunnel to store an imminent storm in an effort to reduce or eliminate untreated CSOs.

Similar to the December 31, 2001 permit, this permit establishes limits regarding CSOs through the use of: a limit on the maximum flow that will receive full advanced treatment; implementation of an approved plan that limits the use of the wet weather treatment facility at interim technology

based limits (both narrative and numeric) for the CSOs; limits on the wet weather treatment discharge (i.e. Outfall 002); and a narrative requirement that NBC implement a long-term control plan that complies with the requirements of the EPA's CSO Policy (which includes compliance with water quality standards).

The NBC's CSOs and wet weather treatment discharges authorized by the permit are not currently in compliance with the EPA CSO policy. Therefore, on January 12, 2004 RIDEM and NBC entered Consent Agreement RIA-330 (most current amendment dated February 27, 2007) that established a three phased schedule for implementation of the approved CDRA. The Consent Agreement requires that NBC amend the plan as necessary to ensure compliance with the Federal Clean Water Act, the EPA CSO control policy, and the Rhode Island Water Quality Regulations. As indicated above, upon issuance of this permit, the DEM anticipates continuing this consent agreement with possible modifications in order to maintain the compliance schedule for the NBC to comply with its CSO requirements

The permit limits (narrative and numeric) included in this permit are consistent with EPA guidance document entitled: "Combined Sewer Overflow: Guidance for Permit Writers" September 1995, which states that: "The CSO Control Policy outlines a process for CSO-related bypass whereby, under certain circumstances the permit writer may allow wet weather flows to receive primary clarification at the POTW treatment plant and then be discharged, without these flows being subject to secondary treatment requirements." The key considerations when allowing primary treatment include: excess primary capacity at the WWTF; advanced treatment is properly operated and maintained; advanced treatment capacity is available for peak dry weather plus an appropriate amount of wet weather flow; and that the cost and performance of alternatives to the bypass have been evaluated in the long-term control. As noted above, NBC is not currently in compliance with the narrative permit limit that requires compliance with the CSO policy and is working on a three-phased approach under consent agreement RIA-330 to come into compliance with this condition. A determination of the NBC's compliance with the Federal Clean Water Act, the EPA CSO control policy, and the Rhode Island Water Quality Regulations will be made upon full implementation of the CDRA.

In accordance with the EPA's guidance document, DEM has assigned "interim" authorization to have a CSO-related bypass around advanced treatment (e.g., outfall 002A). This outfall was previously assigned limits that are "equivalent to primary treatment", which was defined as the use of technologies such that the treated effluent results in removal rates of 50% of TSS and 35% of BOD₅ loadings under the Rhode Island CSO Policy. However, since the time that the last permit was issued the NBC has placed Phases 1 and 2 of its CDRA on-line, which resulted in the full use of the Fields Point CSO Tunnel. Since implementing full use of the Fields Point CSO Tunnel, in late 2014, CSO discharges from outfall 002 have been drastically reduced (e.g., 1 event in 2015 and 2 events for the first 8 months of 2016) and the characteristics of the influent to the wet weather treatment facility have changed significantly (i.e., influent BOD₅ and TSS concentrations have decreased significantly). These changes constitute a material and substantial alteration to the permitted facility and, in accordance with section 402(o)(2) of the Clean Water Act, allows for the relaxation of the previous BPJ-based limit for BOD₅ and TSS percent removal at outfall 002. Therefore, the DEM has changed these percent removal limits to monitor only.

Outfall 002A is subject to additional technology-based effluent limitations. These effluent limitations are:

Enterococci: 276 cfu/100 ml maximum daily
Total Residual Chlorine: 20 ug/L maximum daily

In making the determination to assign these additional limits, DEM considered the factors identified in 40 C.F.R § 125.3(d), including the cost and benefits of the facility, the age of the facility, and the demonstrated ability of treatment technologies to meet the limitations. The permit also requires that the permittee conduct concurrent monitoring for Fecal Coliform to evaluate potential impacts to shellfishing. Since the Enterococci and Total Residual Chlorine limits for

outfall 002 are new limits, which may require significant upgrades to meet, the DEM intends on including interim limits and a compliance schedule in a consent agreement. This compliance schedule will allow NBC to evaluate compliance alternatives for these limits as part of the NBC's development of its revised Long-Term Control Plan.

For the purposes of monitoring requirements at outfall 002, an overflow shall be defined as any event which causes effluent to enter the receiving water for a time greater than or equal to fifteen (15) minutes. All discharges from outfall 002 created by storm events that are greater than the one year six hour storm are not subject to the limitations and should not be included in DMR reporting calculations. However, any discharge from outfall 002, regardless of the size of the storm event, must be reported to the DEM's Operations and Maintenance Program. Overflow occurrences shall be considered to be separate overflows if six (6) or more hours separate two (2) overflow events.

Dry weather overflows from the CSO facilities are not permitted. A regular maintenance/inspection program, a plan to maximize flow to the Treatment Plant and storage within the collection system are also required.

Other Limits and Conditions

The effluent monitoring requirements have been specified in accordance with RIPDES regulations as well as 40 CFR 122.41(j)(1), 122.44(i), and 122.48 to yield data representative of the discharge.

Permits must contain sludge conditions requiring compliance with limits, State laws, and applicable regulations as per Section 405(d) of the CWA and 40 CFR 503. The DEM Sludge Order of Approval sets forth the conditions to ensure this compliance. The permit contains requirements for the permittee to comply with the State's Sludge Regulations and the permittee's DEM Order of Approval for sludge disposal in accordance with the requirements of Section 405(d) of the CWA.

The permit contains a reporting requirement for a local program to regulate industrial discharges to the sewer system (referred to as pretreatment program). This program is being required under authority of Section 402(b)(8) of the CWA and 40 CFR 122.44(j)(2) and 403.8 because NBC Field's Point receives significant discharges of industrial wastewater. Attachment A-1 is the EPA Region 1 Annual Pretreatment Report Summary Sheet.

The Office has determined that all permit limitations are consistent with the Rhode Island Antidegradation policy.

The remaining general and specific conditions of the permit are based on the RIPDES regulations as well as 40 CFR Parts 122 through 125 and consist primarily of management requirements common to all permits.

Final Permit Limits

Presented in the following Tables is a summary of the permit limitations set forth in the Final Permit for all Outfalls.

Table #3: Outfall 001A – WWTF Effluent

Parameter	Monthly Average	Weekly Average	Daily Maximum
Flow ¹	--- MGD		--- MGD ¹
Flow	65 MGD		--- MGD ¹

CBOD ₅ ⁴ November 1 – April 30	25 mg/L	40 mg/L	45 mg/L
CBOD ₅ Mass Limits November 1 – April 30	13,553 lbs/day		24,395 lbs/day
CBOD ₅ ⁴ May 1 – October 31	10 mg/L	10 mg/L	15 mg/L
CBOD ₅ Mass Limits May 1 – October 31	5,421 lbs/day		8,132 lbs/day
CBOD ₅ % Removal	85 %		
TSS ⁴ November 1 – April 30	30 mg/L	45 mg/L	50 mg/L
TSS Mass Limits November 1 – April 30	16,263 lbs/day		27,105 lbs/day
TSS ⁴ May 1 – October 31	20 mg/L	20 mg/L	30 mg/L
TSS Mass Limits May 1 – October 31	10,842 lbs/day		16,263 lbs/day
TSS % Removal	85 %		
Settleable Solids		--- ml/L	--- ml/L
Enterococci	<u>35 cfu</u> 100 mL		<u>276 cfu</u> 100 mL
Fecal Coliform	<u>--- MPN</u> 100 mL	<u>--- MPN</u> 100 mL	<u>--- MPN</u> 100 mL
Total Residual Chlorine	65.0 µg/L		65.0 µg/L
pH	6.0 SU (min.)		9.0 SU (max.)
Oil & Grease	--- mg/L		--- mg/L
Total Phosphorus	--- mg/L		--- mg/L
TKN (as N)	--- mg/L		--- mg/L
Total Nitrate (as N)	--- mg/L		--- mg/L
Total Nitrite (as N)	--- mg/L		--- mg/L
Total Nitrogen (as N) May 1 – October 31	5.0 mg/L		--- mg/L
Total Nitrogen (as N) Mass Limits May 1 – October 31	2,711 lb/d		
Total Nitrogen (as N) November 1 – April 30	--- mg/L ²		--- mg/L
Total Nitrogen (as N) Mass Limits November 1 – April 30	--- lb/d ²		
Copper, Total ⁴	24.3 ug/L		24.5 ug/L

Available Cyanide ⁴	4 ug/L ³		4 ug/L ³
Nickel, Total ⁴	127 ug/L		331 ug/L
Ammonia, Total	--- mg/L		--- mg/L
Zinc, Total ⁴	--- ug/L		--- ug/L
Cadmium, Total ⁴	--- ug/L		--- ug/L
Hexavalent Chromium ⁴	--- ug/L		--- ug/L
Lead, Total ⁴	--- ug/L		--- ug/L
Aluminum, Total ⁴	--- ug/L		--- ug/L
Arsenic ⁴	5.4 ug/L		306.3 ug/L
LC ₅₀ - <i>Mysidopsis bahia</i>			≥ 100%
C-NOEC - <i>Arbacia punctulata</i>			%

Note: --- signifies a parameter that must be monitored and data reported; no limit has been established at this time.

¹Flow to the WWTF's headworks shall be reported. All flows received at the headworks shall receive at least primary treatment and disinfection. Up to 77 MGD must receive advanced treatment. Flows greater than 77 MGD shall be diverted to the wet weather treatment facility – Outfall 002A

²The permittee shall operate the treatment facility to reduce the discharge of Total Nitrogen, during the months of November through April, to the maximum extent possible using all available treatment equipment in place at the facility, except methanol addition.

³The limit at which compliance/noncompliance determinations will be based is the Quantitation Limit, which is defined as 10 ug/l for Cyanide.

⁴Samples shall be taken on the influent and effluent.

Table #4: Outfall 002A – Treated Wet Weather Outfall – South Channel

Parameter	Monthly Average	Weekly Average	Daily Maximum
Flow (Volume)	--- MGD		123 MGD
CBOD ₅	--- mg/L		--- mg/L
CBOD ₅ % Removal	---%		
TSS	--- mg/L		--- mg/L
TSS % Removal	---%		
Fecal Coliform	--- MPN 100 mL		--- MPN 100 mL
Enterococci	--- cfu 100 mL		276 cfu 100 mL
Total Residual Chlorine	--- ug/L (min)	--- ug/L (ave)	20 ug/L (max)

Note: --- signifies a parameter that must be monitored and data reported; no limit has been established at this time.

* For monitoring purposes, an overflow is defined as any occurrence of a discharge from a CSO to the receiving water with a minimum duration of 15 minutes. Overflows shall be considered to be separate if they are separated by six (6) or more hours. During months of no overflow DMRs shall be marked as "no discharge." Dry weather overflows of any duration are prohibited. Any discharge from a CSO to the receiving water, regardless of the duration, must be reported as a CSO to the DEM's Operations and Maintenance Program.

V. **Comment Period, Hearing Requests, and Procedures for Final Decisions**

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the Rhode Island Department of Environmental Management, Office of Water Resources, 235 Promenade Street, Providence, Rhode Island, 02908-5767. In accordance with Chapter 46-17.4 of Rhode Island General Laws, a public hearing will be held prior to the close of the public comment period. In reaching a final decision on the draft permit the Director will respond to all significant comments and make these responses available to the public at DEM's Providence Office.

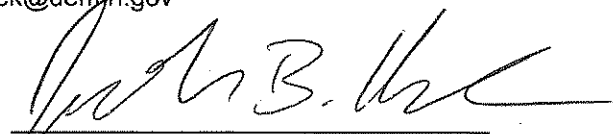
Following the close of the comment period, and after a public hearing, the Director will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments, provided oral testimony, or requested notice. Within thirty (30) days following the notice of the final permit decision any interested person may submit a request for a formal hearing to reconsider or contest the final decision. Requests for formal hearings must satisfy the requirements of Rule 49 of the Regulations for the Rhode Island Pollutant Discharge Elimination System.

VI. **DEM Contact**

Additional information concerning the permit may be obtained between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday, excluding holidays from:

Joseph B. Haberek, P.E.
Department of Environmental Management
Office of Water Resources
235 Promenade Street
Providence, Rhode Island 02908
Telephone: (401) 222-4700, Ext.: 7715
e-mail: joseph.haberek@dem.ri.gov

11/23/16
Date



Joseph B. Haberek, P.E.
Principal Sanitary Engineer
Office of Water Resources
Department of Environmental Management

Attachment A-1: Annual Pretreatment Report Summary Sheet

POTW Name:

NPDES Permit #:

Pretreatment Report Period Start Date:

Pretreatment Report Period End Date:

of Significant Industrial Users (SIUs):

of SIUs Without Control Mechanisms:

of SIUs not Inspected:

of SIUs not Sampled:

of SIUs in Significant Noncompliance (SNC) with Pretreatment Standards:

of SIUs in SNC with Reporting Requirements:

of SIUs in SNC with Pretreatment Compliance Schedule:

of SIUs in SNC Published in Newspaper:

of SIUs with Compliance Schedules:

of Violation Notices Issued to SIUs:

of Administrative Orders Issued to SIUs:

of Civil Suits Filed Against SIUs:

of Criminal Suits Filed Against SIUs:

of Categorical Industrial Users (CIUs):

of CIUs in SNC:

Penalties

Total Dollar Amount of Penalties Collected \$

of IUs from which Penalties have been collected:

Local Limits

Date of Most Recent Technical Evaluation of Local Limits:

Date of Most Recent Adoption of Technically Based Local Limits:

Pollutant

Limit (mg/l)

MAHL (lb/day)

Pollutant	Limit (mg/l)	MAHL (lb/day)

ATTACHMENT A-2

DESCRIPTION OF DISCHARGE: Secondary treated domestic and industrial wastewater.
DISCHARGE: 001A - Advanced Treatment Discharge

AVERAGE EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE OF SELECTED POLLUTANTS:

PARAMETER	DAILY MAXIMUM¹	WKLY AVERAGE²	MONTHLY AVERAGE³
FLOW (MGD)	65.05		44.76
BOD ₅ (PPM)	17.81	12.23	10.59
BOD ₅ (LBS/DAY)	8359.70		4052.64
BOD ₅ (% REMOVAL)			90.87
TSS (PPM)	17.98	11.19	9.46
TSS (LBS/DAY)	8254.87		3605.13
TSS (% REMOVAL)			89.07
Fecal Coliform	85.91 MPN/100 ml	26.18 MPN/100 ml	13.62 MPN/100 ml
pH	6.29 S.U. (Minimum) ⁴		7.20 S.U. (Maximum) ⁵
Chlorine Residual	15.74		4.35
Cyanide (PPB)	4.19		1.53
Total Copper (PPB)	9.21		6.31
Total Mercury (PPB)	0.0076		0.0043
Total Nickel	24.552		16.32
Total Silver	0.25		0.12
Total Zinc	31.04		23.84
Ammonia (PPM) May-Oct	8.45		5.97
Total Kjeldahl Nitrogen (PPM)	11.02		7.91
Nitrogen, Nitrate (PPM)	3.26		1.85
Nitrogen, Nitrite (PPM)	0.86		5.67
Nitrogen, Total (PPM) May-Oct	13.40		9.76
Nov-Apr	13.57		10.55
Nitrogen, Total (LBS/DAY) May-Oct			3420
Nov-Apr			4087
Phosphorus (PPM)	2.05		1.35
Oil and Grease (PPM)	1.16		1.15
Solids, Settleable (ML/L)	0.257	0.071	

¹Data represents the mean of the daily maximum data from July 2009 – June 2014

²Data represents the mean of the weekly average data from July 2009 – June 2014

³Data represents the mean of the monthly average data from July 2009 – June 2014

⁴Data represents the mean of the minimum monthly average data from July 2009 – June 2014

⁵Data represents the mean of the maximum monthly average data from July 2009 – June 2014

Biotoxicity Data LC₅₀ Values (in percent effluent)

Mysid

2012 2 nd qtr >100	3 rd qtr. >100	4 th qtr. >100	2013 1 st qtr. >100	2 nd qtr >100	3 rd qtr. >100	4 th qtr. >100	2014 1 st qtr. >100	2 nd qtr >100
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ATTACHMENT A-2 CONTINUED

DESCRIPTION OF DISCHARGE: Secondary treated domestic and industrial wastewater.
DISCHARGE: 002A - Wet Weather Discharge

AVERAGE EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE OF SELECTED POLLUTANTS²:

PARAMETER	DAILY MAXIMUM ¹	WKLY AVERAGE ²	MONTHLY AVERAGE ³
FLOW (MGD)	18.07		10.99
BOD ₅ (PPM)	52.04		32.61
BOD ₅ (% REMOVAL)			64.93
TSS (PPM)	69.56		57.97
TSS (% REMOVAL)			56.58
Fecal Coliform	35.40 MPN/100 ml ⁴		6.72 MPN/100 ml ⁴
pH	6.78 S.U. (Minimum) ⁵		7.04 S.U. (Maximum) ⁶
Chlorine Residual (PPB)			2070

¹Data represents the mean of the daily maximum data from July 2009 – June 2014

²Data represents the mean of the weekly average data from July 2009 – June 2014

³Data represents the mean of the monthly average data from July 2009 – June 2014

⁴Data represents the geometric mean of the data from July 2009-June 2014

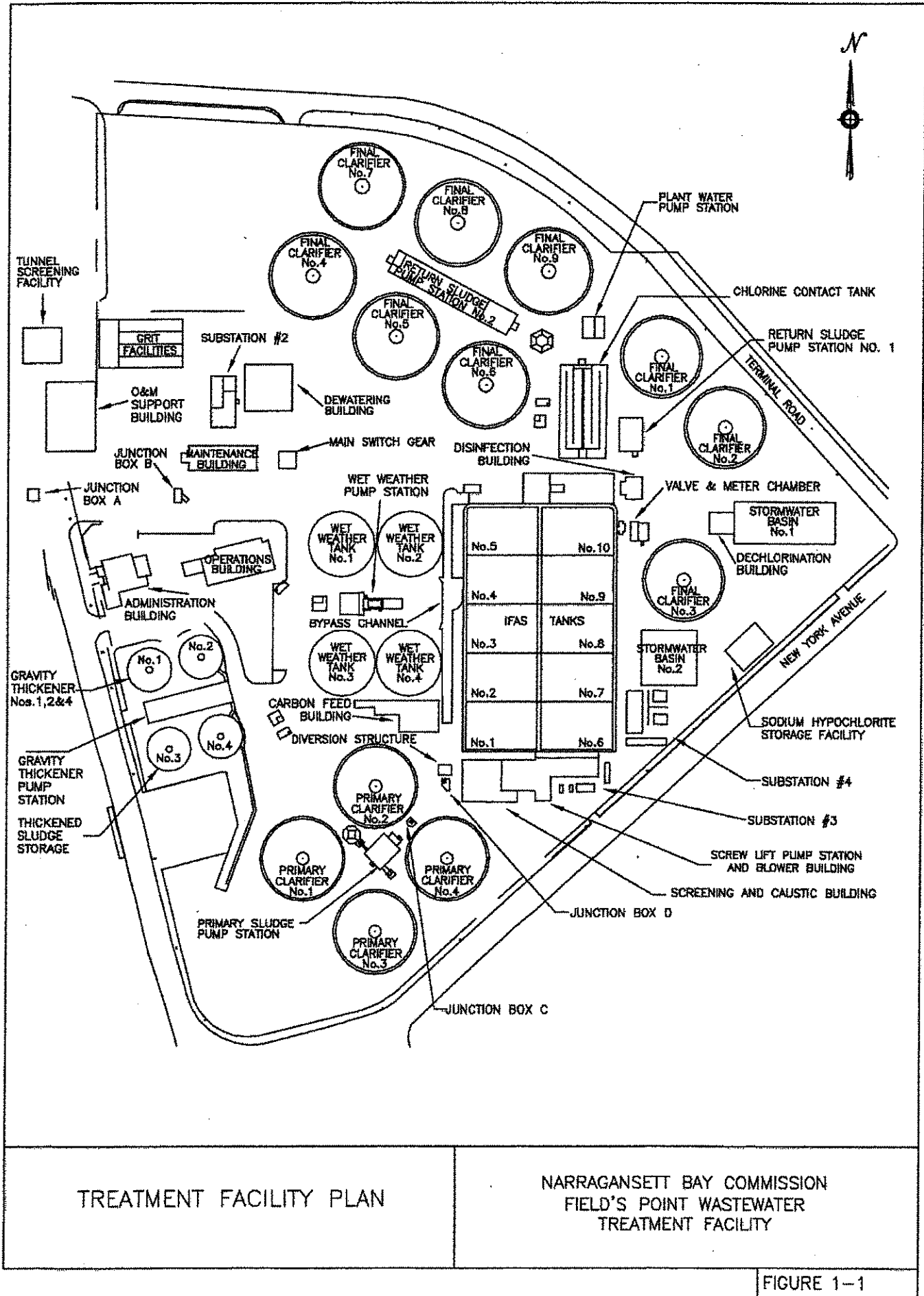
⁵Data represents the mean of the minimum data from July 2009 – June 2014

⁶Data represents the mean of the maximum data from July 2009 – June 2014

Figures #1a & 1b

Site Layout (Fig. 1a) and Process Diagram (Fig. 1b) of the Field's Point Wastewater Treatment Facility

Fig. 1a - site plan

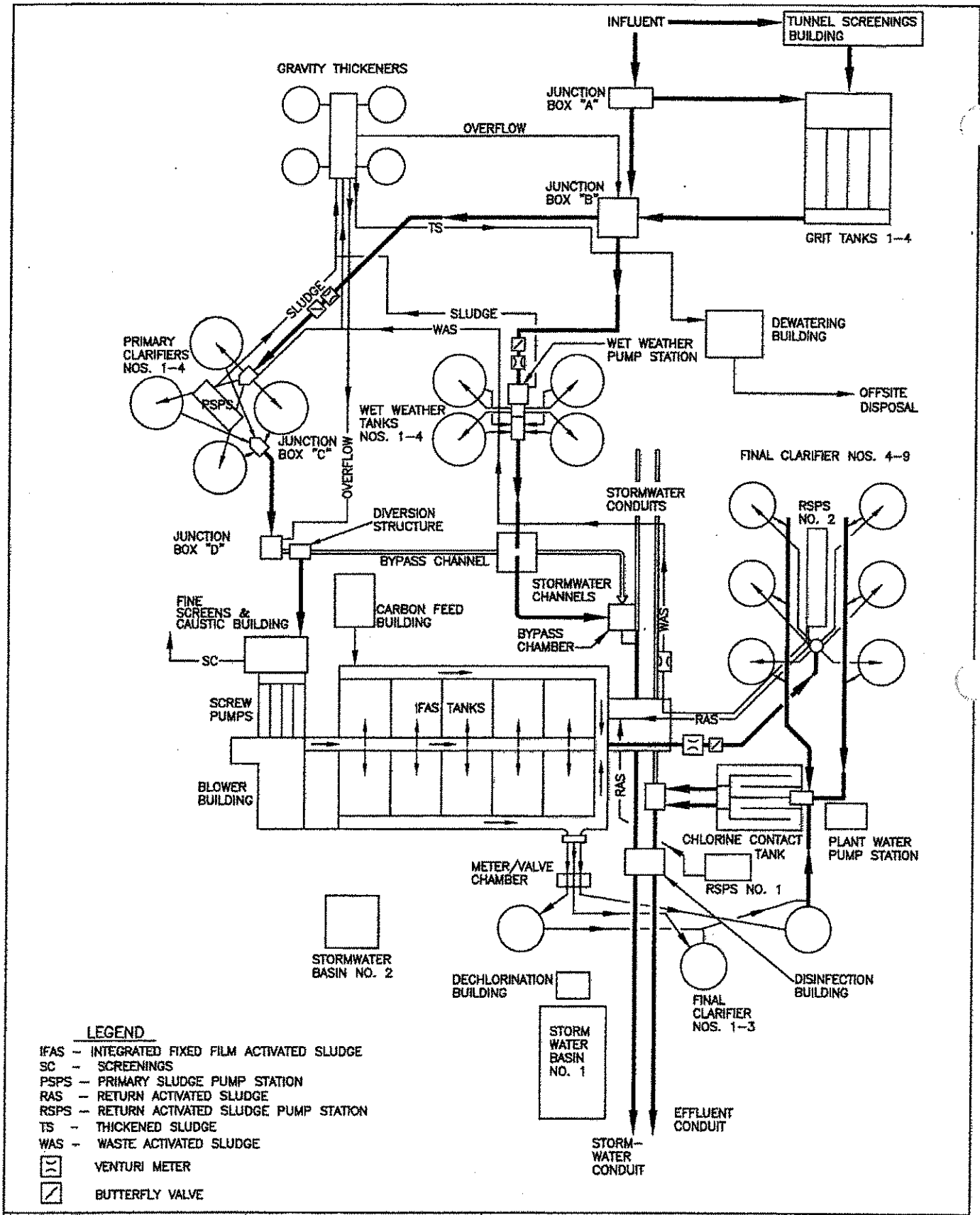


TREATMENT FACILITY PLAN

NARRAGANSETT BAY COMMISSION
FIELD'S POINT WASTEWATER
TREATMENT FACILITY

FIGURE 1-1

Fig. 1b - process flow diagram



PROCESS OVERVIEW DIAGRAM

NARRAGANSETT BAY COMMISSION
FIELD'S POINT WASTEWATER
TREATMENT FACILITY

Figure #2

**Location of the Field's Point Wastewater Treatment Facility
Outfall and the Associated Chronic and Acute Mixing Zones**

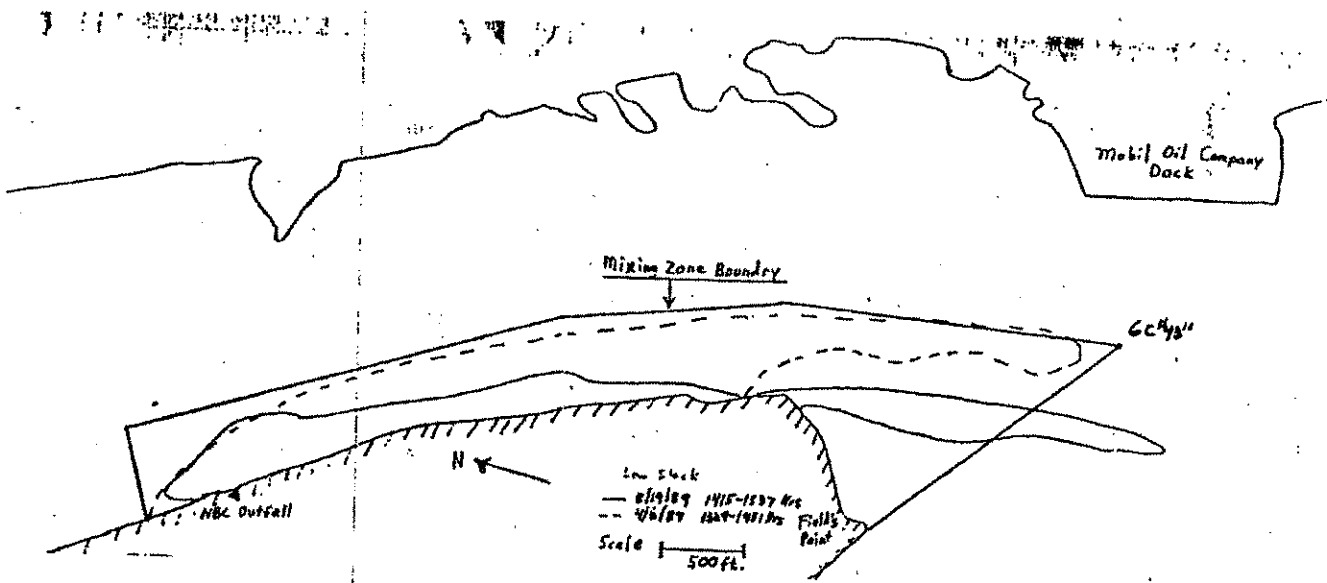


FIGURE 4 - NBC low slack dye dilution contours (from OSI 1989) Dilution Factor = 20

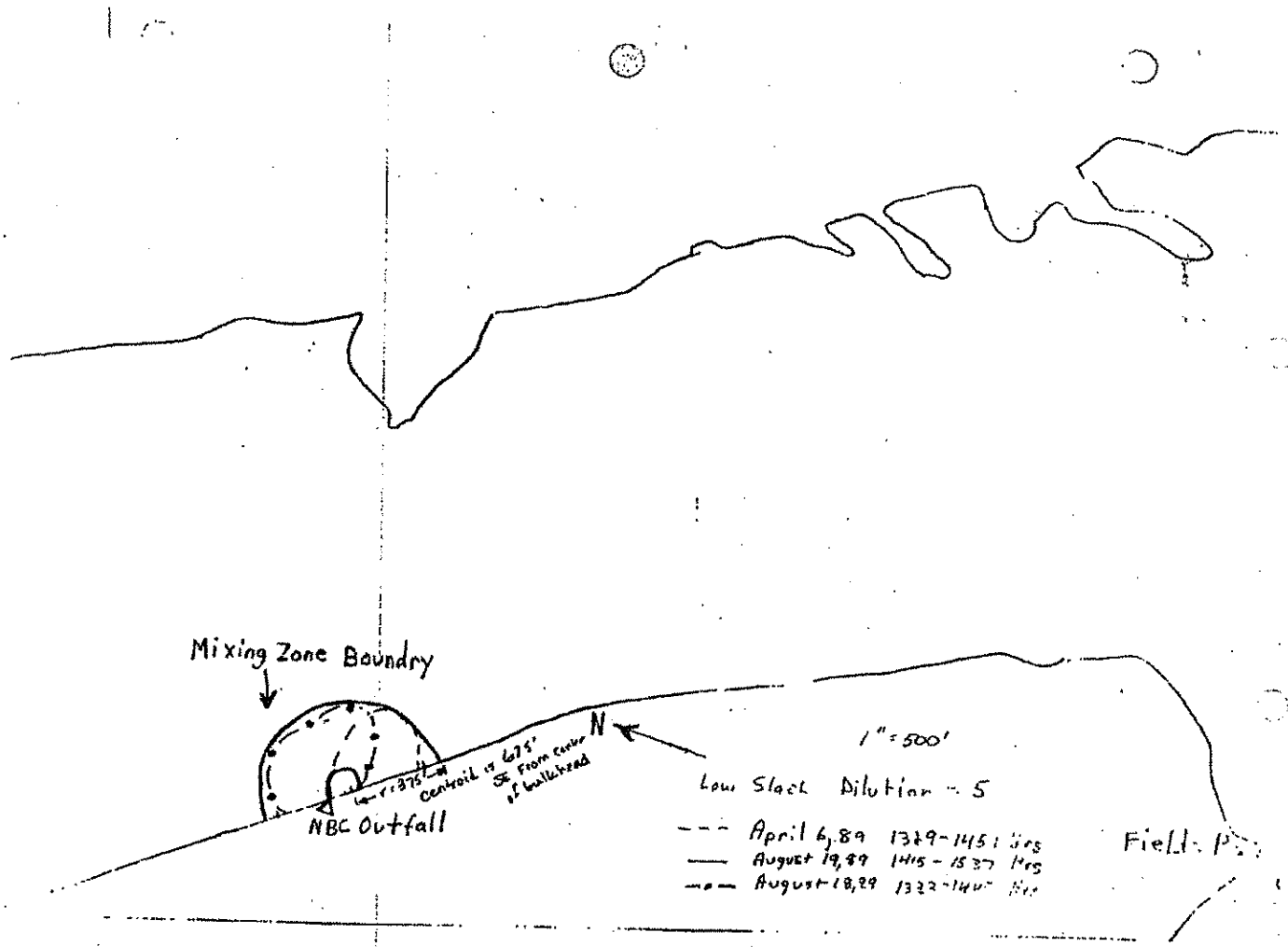


FIGURE 5 - NBC low slack tide dilution contours (from OSI 1999) Dilution Factor = 5

ATTACHMENT A-3

September 20, 2016 DEM Translator Study Review Memo

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

INTER-OFFICE MEMO

TO: Eric A. Beck, P.E. DATE: September 20, 2016
Supervising Sanitary Engineer
DEPT: Environmental Management

FROM: Joseph B. Haberek, P.E.
Principal Sanitary Engineer
DEPT: Environmental Management

CC: Samuel Kaplan, P.E. and Angelo Liberti, P.E.

SUBJECT: Review of NBC's Final Metals Compliance Report

This memo is being written in response to the Department of Environmental Management's (DEM's) review of the Narragansett Bay Commission's (NBC's) Final Metals Compliance Evaluation Report that was dated September 30, 2004 (the Report). This report was submitted to the DEM as required under paragraph 14(a) of consent agreement RIA-330. Specifically, paragraph 14(a) required that the NBC submit a Final Metals Compliance Evaluation Report that included the following elements: 1) a summary of the results of the NBC's metals translator sampling including all data from field metals translator studies and the seasonal surveys of the Providence and Seekonk Rivers and a recommendation on the appropriate metals translator to be used in calculating Rhode Island Pollutant Discharge Elimination System (RIPDES) limits, 2) any additional data collected since the submission of the Interim Metals Compliance Report, including potable water supply sampling, river monitoring, and domestic wastewater characterization sampling, 3) revised RIPDES permit limits calculated using the recommended metals translator and the new background receiving water concentrations, 4) a new local limits evaluation using the updated domestic wastewater characterization and the revised RIPDES limits, and 5) an evaluation of the NBC's ability to comply with the revised RIPDES limits.

Based upon a review of the September 30, 2004 Report, it has been determined that it includes all of the elements required under paragraph 14(a) of the NBC's consent agreement. However, since the recently revised Rhode Island Water Quality Regulations includes several changes to water quality criteria, a detailed review of items 3 (revised RIPDES limit calculations), 4 (updated local limits), or 5 (NBC's compliance evaluation) were not conducted. As we previously agreed, since the changes to the Rhode Island Water Quality Regulations will impact the RIPDES limits that the NBC would have calculated, we decided not to perform a detailed review of items 3,4, and 5. Instead, we agreed that we would review the metals translators and, once we came to an agreement on these translators, use them to calculate revised RIPDES limits that would be included in a draft RIPDES permit. We would then have the NBC update their local limits evaluation using these new RIPDES limits and perform a new compliance evaluation as part of the permit reissuance process. Therefore, this memo focuses on my review of the results of the NBC's metals translator study.

The following table summarizes the Environmental Protection Agency's (EPA's) requirements for a metals translator study, from the EPA's June 1996 document "The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion". The table also includes columns that identify how the NBC proposed to address the EPA requirements in their metals translator scope of work that was submitted with the May 16, 2001 Interim Metals Compliance Report and what activities they actually undertook as part of their metals translator study.

Final Metals Compliance Evaluation Report Review Memo

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<i>EPA Metals Translator Guidance Requirement</i>	<i>Scope of Work Specification</i>	<i>Actually Achieved</i>
3.1.1 – sample during critical (i.e., low flow) conditions	Surveys will be planned to coincide with critical conditions for pH and flow	Surveys were conducted during 4 seasons at a variety of sites and depths over a full tidal cycle and under different environmental and wastewater effluent conditions
3.1.2 – field study should extend over several months	4 seasonal receiving water surveys over the course of a year	4 seasonal surveys were conducted over the course of a 10 month period
3.2.1 – collect samples at or beyond the edge of the mixing zone from a point where complete mixing has occurred	4 seasonal surveys of the Providence and Seekonk Rivers will be conducted	4 seasonal surveys conducted for both the Providence and Seekonk Rivers on 7/23/01, 10/28/01, 12/16/01, and 5/8/02
3.2.2 – collect samples from the far field to ensure that the translator will be protective of the characteristics of the receiving water not just the effluent	The study area will include the entire length of the Providence and Seekonk Rivers	The study area for the Providence River included 1 transect upstream of the Fields Point WWTF and 3 transects downstream. The study area for the Seekonk River included 1 transect above the Bucklin Point WWTF, 1 transect at the outfall, and 4 transects downstream.
3.2.3 – collect samples from effluent and the upstream ambient water and combine in the laboratory at the design dilution factor to ensure that the translator is protective at design conditions (i.e., 7Q10 and design flow)	Ambient samples will be collected from GSO dock and Fields Point effluent samples will be mixed at a 10:1 ratio and analyzed	Ambient and WWTF effluent samples were collected, but were not analyzed at the 10:1 dilution ratio.
3.3 – at least 10 sets of total and dissolved metals samples should be collected during low flow conditions or 20 pairs over all flow conditions	4 surveys will be conducted and a total of 60 sample sets will be collected during each survey (40 in the Providence River and 20 in the Seekonk River)	A total of 106 sample sets were taken from the Providence River and a total of 103 sample sets were taken from the Seekonk River
3.4 – sample for total, dissolved, and particulate metals fractions as well as TSS, Particulate Organic Carbon (POC), pH, hardness and flow	Samples will be analyzed for total and dissolved metals	Samples were analyzed for total and dissolved metals, TSS, POC, pH, salinity, chlorophyll, silicate, phosphate, ammonia, nitrate, nitrite, total nitrogen, total phosphorus, Dissolved Organic Carbon (DOC), and particulate nitrogen
3.5 – use trace metals sampling (i.e., clean sampling) techniques	EPA Method 1669 trace metals sampling methods will be used	Trace metals methods were used

Final Metals Compliance Evaluation Report Review Memo

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September 20, 2016

As can be seen from the table above, the NBC's metals translator study that was submitted as part of the September 30, 2004 Report generally concurs with the EPA's guidance and with the scope of work from the Interim Metal Compliance Report. The only exception is that the NBC did not mix ambient samples and Fields Point effluent samples at a 10:1 ratio and analyze the combined sample. However, due to the number of in-stream samples (209 total sets of samples) and the seasonal and flow variability that they obtained from the four (4) surveys, it does not appear that this is a major issue due to the fact that they were able to get such a large data set at various dilutions. Therefore, it has been determined that, although the NBC did not analyze a mixture of the receiving water and effluent at the 10:1 dilution factor specified in the permit, the metals translator data collected by the NBC is adequate to determine a site-specific metals translator provided that a conservative evaluation is used.

When analyzing the metals translator data, the EPA's guidance document recommends using the geometric mean of the calculated translators if the data is log-normally distributed plus an appropriate margin of safety. The NBC indicated that the data is lognormal. Therefore, the use of the geometric mean metals translator values is appropriate.

Based upon a review of the seasonal metals translator data for each river, the DEM has determined that there is a significant difference in the translators measured between the seasons. Specifically, the DEM has determined that the geometric means of the translators for each river for the October 2001 survey were significantly higher than the other three surveys. Therefore, since the higher metals translators results in lower total metals permit limits, the DEM has determined that it is appropriate to focus on the October 2001 survey as the most conservative survey. The following table demonstrates that the translators calculated from the October 2001 survey were either the maximum or very close to the maximum of the translators calculated during all four surveys for both rivers.

Table 1: Seasonal Variability Analysis (Maximum Values are in Bold)

Date	River	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
		Cadmium	Copper	Lead	Nickel	Silver
July 2001	Providence	0.830	0.631	0.077	0.907	0.281
	Seekonk	0.361	0.272	0.022	0.790	0.161
October 2001	Providence	0.890	0.779	0.207	0.975	0.400
	Seekonk	0.907	0.638	0.131	0.902	0.466
December 2001	Providence	0.918	0.651	0.054	0.974	0.404
	Seekonk	0.749	0.475	0.070	0.853	0.480
May 2002	Providence	0.791	0.754	0.097	0.918	0.414
	Seekonk	0.721	0.455	0.084	0.908	0.239

In addition to analyzing the translator data for seasonal variability, the DEM also evaluated the data for tidal variability. After comparing the geometric means of the translators for the Providence and Seekonk Rivers during the incoming and outgoing tides against each other, it was determined that there is not a significant correlation between the translators and the tides. Therefore, it is appropriate to use both tides when determining the translators for the October 2001 survey. The following table illustrates this point for the October 2001 data. Note: Other surveys had similar correlations.

Final Metals Compliance Evaluation Report Review Memo
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 September 20, 2016

Table 2: Tidal Variability Analysis

River	Tide	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
		Cadmium	Copper	Lead	Nickel	Silver
Providence	In	0.894	0.765	0.236	0.954	0.460
	Out	0.887	0.793	0.182	0.996	0.348
Seekonk	In	0.935	0.613	0.131	0.929	0.479
	Out	0.880	0.665	0.132	0.876	0.454

The DEM also evaluated the data for spatial variability (i.e., variability from transect to transect). After comparing the geometric means of the translators for each of the Providence and Seekonk Rivers' transects against each other, it was determined that there is not a significant correlation between the translators for each transect (e.g., no transect consistently had the highest translators). Therefore, it is appropriate to use data from all transects when calculating the translators for the October 2001 survey. The following table illustrates this point for the October 2001 data. Note: Data from the Providence River's transect 5 was not used since it only consisted of one data point.

Table 3: Transect Variability Analysis

River	Transect	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
		Cadmium	Copper	Lead	Nickel	Silver
Providence	1	0.916	0.732	0.169	0.991	0.341
	2	0.871	0.770	0.180	0.962	0.380
	3	0.886	0.806	0.229	0.984	0.457
	4	0.861	0.751	0.267	0.959	0.364
	All Data	0.890	0.779	0.207	0.975	0.400
Seekonk	1	0.859	0.672	0.107	0.861	0.621
	2	0.930	0.650	0.139	0.950	0.452
	3	0.910	0.583	0.091	0.922	0.487
	4	0.849	0.668	0.139	0.894	0.461
	All Data	0.907	0.638	0.131	0.902	0.466

Based on the analysis above, the DEM has determined that the most appropriate metals translator data set to use is the data from the October 2001 surveys. This data set was selected since the translators calculated from this survey were consistently higher than the translators calculated from the other surveys. Therefore, it was determined that this survey is representative of the most conservative season. Further after evaluation of the translators at various transects and tides, it was determined that there is not significant variability caused by tides and transects. As a result, the DEM determined that the appropriate translators to use are the ones calculated from the October 2001 survey. The following table is a summary of the final metals translator values for the Providence and Seekonk Rivers after including a 5% margin of safety. Note: After incorporating a 5% margin of safety into the Providence River's nickel translator the value was greater than 1.0, therefore, this translator was set equal to 1.0.

Table 4: Final Metals Translators for Each River

River	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
	Cadmium	Copper	Lead	Nickel	Silver
Providence	0.935	0.818	0.217	1.000	0.420
Seekonk	0.952	0.670	0.138	0.947	0.489

Final Metals Compliance Evaluation Report Review Memo

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Although the Bucklin Point facility discharges into the Seekonk River, which subsequently flows into the Providence River, a review of the September 1991 dye study for the Bucklin Point WWTF indicates that the dilution by the time that Bucklin Point's effluent reaches the Providence River is at least 30:1. Therefore, since there will be significantly more dilution at the point where Bucklin Point's effluent eventually enters the Providence River vs. the near-field dilution of (1:1 acute and 2:1 chronic), using the translators for the Seekonk and the near-field dilution factors to assign metals limits for the Bucklin Point facility will be protective of both rivers. As a result, the following table includes the final translators that will be assigned:

Table 5: Final Metals Translators for Each Wastewater Treatment Facility (WWTF)

WWTF	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
	Cadmium	Copper	Lead	Nickel	Silver
Fields Point	0.935	0.818	0.217	1.000	0.420
Bucklin Point	0.952	0.670	0.138	0.947	0.489

Prior to making a final decision regarding the metals translators to be applied to the NBC's facilities, it was decided that we should look at the dissolved/total metals ratios in the upstream water and the NBC's outfalls.

To evaluate the dissolved and total metals concentrations in the upstream water, I contacted Connie Carey and Elizabeth Scott and requested that they provide me with any data that they have which includes both total and dissolved metals for the Blackstone River. The only data that we found, which included both dissolved and total metals for the same sample sets, was from the Blackstone River Initiative (BRI). The BRI included dissolved and total metals data for Cadmium, Copper, Lead, and Nickel from three surveys conducted in July 1991, August 1991, and October 1991. The following data is a summary of this data for the last two stations in the Blackstone River (Lonsdale Avenue – Station #: BLK20 and Slater Mill Dam – Station #: BLK 21). All other stations in the BRI were significantly upstream of the Slater Mill Dam.

Table 6: Metals Translators Calculated from the BRI Report

River	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)			
	Cadmium	Copper	Lead	Nickel
BLK20	0.545	0.610	0.337	0.831
BLK21	0.363	0.613	0.276	0.743

To evaluate the dissolved and total metals concentrations in the outfalls, I used the data presented in attachment 2J of the NBC's 2004 Final Metals Compliance Report. The following table is a summary of this data from attachment 2J.

Table 7: Metals Translators Calculated at the Outfalls

River	Translator (Geometric Mean w/ Fd>1.0 set at 1.0)				
	Cadmium	Copper	Lead	Nickel	Silver
FP Outfall	0.916	0.763	0.093	0.963	0.334
BP Outfall	0.844	0.667	0.175	0.871	0.408

Final Metals Compliance Evaluation Report Review Memo

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As can be seen from the data in tables 6 and 7, there is a significant increase in the percent of dissolved metals in the Rivers in the immediate vicinity of the treatment facilities. This is a result of the discharges from the WWTF's having high levels of treatment and, therefore, predominantly dissolved metals. The only metal that does not follow this trend is Lead. This may be a result of lead in the WWTF's primarily consisting of particulate lead.

Table 5 is a summary of the metals translator values recommended for each facility. Based upon a review of Table 5 against Table 6, it would appear that the final recommended metals translators are conservative when compared to the translators obtained from the BRI (i.e., the recommended translators are significantly higher than the BRI translators). This is true for all metals except Lead. In addition, the translators in Table 5 are also conservative relative to the translators calculated at the outfalls (i.e., the translators in Table 5 are greater than the translators in Table 7). This holds true for all metals, including Lead. Therefore, it appears that the translators included in Table 5 will be protective of water quality and they will be used as the final metals translators for the NBC's WWTFs.

The metals translators in table 5 will be used to calculate permit limits in the NBC's RIPDES permits. When calculating RIPDES permit limits, the DEM will also use the following background metals concentrations from the Army Corps of Engineers and EPA's "Draft Environmental Impact Statement for the Rhode Island Region Long-Term Dredged Material Disposal Site" (see Table 3-10 of the Draft Environmental Impact Statement Report) with corrections made to account for arithmetic errors as noted in file correspondence between the NBC and DEM..

Table 8: Background Concentrations

Pollutant	Background Conc. (ug/l)
As	1.04
Cd	0.035
Cr (VI)	0.272
Cu	0.385
Pb	0.079
Hg	0.000636
Ni	0.475
Se	0.07
Ag	0.023
Zn	1.33

ATTACHMENT A-4

**Calculation of Allowable Acute and Chronic Discharge Limitations
Based on Saltwater Aquatic Life Criteria and Human Health Criteria**

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS FACILITY SPECIFIC DATA INPUT SHEET

NOTE: LIMITS BASED ON RI WATER QUALITY CRITERIA DATED JULY 2006

FACILITY NAME: **NBC - Fields Point WWTF**

RIPDES PERMIT #: **RI0100315**

	DISSOLVED BACKGROUND DATA (ug/L)	ACUTE METAL TRANSLATOR	CHRONIC METAL TRANSLATOR
ALUMINUM	NA	NA	NA
ARSENIC	1.04	1	1
CADMIUM	0.035	0.935	0.935
CHROMIUM III	NA	NA	NA
CHROMIUM VI	0.272	0.993	0.993
COPPER	0.385	0.818	0.818
LEAD	0.079	0.217	0.217
MERCURY	0.000636	0.85	NA
NICKEL	0.475	1.000	1.000
SELENIUM	0.07	0.998	0.998
SILVER	0.023	0.420	0.420
ZINC	1.33	0.946	0.946

USE NA WHEN NO DATA IS AVAILABLE

NOTE 1: BACKGROUND DATA BASED ON CONCENTRATIONS OBTAINED FROM THE ARMY CORPS OF ENGINEERS AND EPA'S 2004 "DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE RHODE ISLAND REGION LONG-TERM DREDGED MATERIAL DISPOSAL SITE" WITH CORRECTIONS MADE BY DEM/NBC (SEE FILE)

NOTE 2: METALS TRANSLATORS FOR CADMIUM, COPPER, LEAD, NICKEL, AND SILVER ARE CALCULATED FROM NBC SAMPLING OF PROVIDENCE AND SEEKONK RIVERS, OCTOBER 2001 SURVEY. ALL OTHER METALS TRANSLATORS ARE FROM THE RHODE ISLAND WATER QUALITY REGULATIONS

DILUTION FACTORS	
ACUTE =	5 x
CHRONIC =	20 x
HUMAN HEALTH =	20 x

NOTE: WWTF'S DILUTION FACTORS OBTAINED FROM MAY 1, 1992 PERMIT FACT SHEET

TOTAL AMMONIA CRITERIA (ug/L)	
WINTER ACUTE =	31000
CHRONIC =	4700
SUMMER ACUTE =	7500
CHRONIC =	1100

NOTE 1: LIMITS ARE FROM TABLE 3 IN THE RI WATER QUALITY REGS. USING:

SALINITY = 20 g/Kg; pH = 7.8 s.u.
WINTER (DEC-APRIL) TEMP=5.0 C;
SUMMER (MAY-NOV) TEMP=25.0 C.
AS INDICATED IN AUGUST 11, 2000 LETTER

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: NBC - Fields Point WWTF RIPDES PERMIT #: RI0100315

NOTE: METALS CRITERIA ARE DISSOLVED, METALS LIMITS ARE TOTAL; AMMONIA CRITERIA AND LIMITS HAVE BEEN CONVERTED TO ug/l N.

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
PRIORITY POLLUTANTS							
TOXIC METALS AND CYANIDE							
ANTIMONY	7440360			No Criteria		640	10240
ARSENIC (limits are total recoverable)	7440382	1.04	69	306.34	36	1.4	5.44
ASBESTOS	1332214			No Criteria			No Criteria
BERYLLIUM	7440417			No Criteria			No Criteria
CADMIUM (limits are total recoverable)	7440439	0.035	40	192.3636364	8.8		168.7005348
CHROMIUM III (limits are total recoverable)	16065831	NA		No Criteria			No Criteria
CHROMIUM VI (limits are total recoverable)	18540299	0.272	1100	4983.79859	50		901.1399799
COPPER (limits are total recoverable)	7440508	0.385	4.8	24.52322738	3.1		59.27261614
CYANIDE	57125		1	4.00	1	140	16
LEAD (limits are total recoverable)	7439921	0.079	210	4353.382488	8.1		664.9723502
MERCURY (limits are total recoverable)	7439976	0.000636	1.8	9.526418824	0.94	0.15	2.687916
NICKEL (limits are total recoverable)	7440020	0.475	74	331.1	8.2	4600	138.575
SELENIUM (limits are total recoverable)	7782492	0.07	290	1307.334669	71	4200	1279.228457
SILVER (limits are total recoverable)	7440224	0.023	1.9	20.13809524			No Criteria
THALLIUM	7440280			No Criteria		0.47	7.52
ZINC (limits are total recoverable)	7440666	1.33	90	422.4947146	81	26000	1514.513742
VOLATILE ORGANIC COMPOUNDS							
ACROLEIN	107028			No Criteria		290	4640
ACRYLONITRILE	107131			No Criteria		2.5	40
BENZENE	71432			No Criteria		510	8160
BROMOFORM	75252			No Criteria		1400	22400
CARBON TETRACHLORIDE	56235			No Criteria		16	256
CHLOROBENZENE	108907			No Criteria		1600	25600
CHLORODIBROMOMETHANE	124481			No Criteria		130	2080
CHLOROFORM	67663			No Criteria		4700	75200
DICHLOROBROMOMETHANE	75274			No Criteria		170	2720
1,2DICHLOROETHANE	107062			No Criteria		370	5920
1,1DICHLOROETHYLENE	75354			No Criteria		7100	113600
1,2DICHLOROPROPANE	78875			No Criteria		150	2400
1,3DICHLOROPROPYLENE	542756			No Criteria		21	336
ETHYLBENZENE	100414			No Criteria		2100	33600
BROMOMETHANE (methyl bromide)	74839			No Criteria		1500	24000
CHLOROMETHANE (methyl chloride)	74873			No Criteria			No Criteria
METHYLENE CHLORIDE	75092			No Criteria		5900	94400

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: NBC - Fields Point WWTF RIPDES PERMIT #: R10100315

NOTE: METALS CRITERIA ARE DISSOLVED, METALS LIMITS ARE TOTAL; AMMONIA CRITERIA AND LIMITS HAVE BEEN CONVERTED TO ug/l N.

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
1,1,2,2-TETRACHLOROETHANE	79345			No Criteria		40	640
TETRACHLOROETHYLENE	127184			No Criteria		33	528
TOLUENE	108883			No Criteria		15000	240000
1,2-TRANS-DICHLOROETHYLENE	156605			No Criteria		10000	160000
1,1,1-TRICHLOROETHANE	71556			No Criteria		160	No Criteria
1,1,2-TRICHLOROETHANE	79005			No Criteria		300	2560
TRICHLOROETHYLENE	79016			No Criteria		300	4800
VINYL CHLORIDE	75014			No Criteria		2.4	38.4
ACID ORGANIC COMPOUNDS							
2-CHLOROPHENOL	95578			No Criteria		150	2400
2,4-DICHLOROPHENOL	120832			No Criteria		290	4640
2,4-DIMETHYLPHENOL	105679			No Criteria		850	13600
4,6-DINITRO-2-METHYL PHENOL	534521			No Criteria		280	4480
2,4-DINITROPHENOL	51285			No Criteria		5300	84800
4-NITROPHENOL	88755			No Criteria			No Criteria
PENTACHLOROPHENOL	87865			52	7.9	30	126.4
PHENOL	108952		13	No Criteria		1700000	27200000
2,4,6-TRICHLOROPHENOL	88062			No Criteria		24	384
BASE NEUTRAL COMPOUNDS							
ACENAPHTHENE	83329			No Criteria		990	15840
ANTHRACENE	120127			No Criteria		40000	640000
BENZIDINE	92875			No Criteria		0.002	0.032
POLYCYCLIC AROMATIC HYDROCARBONS				No Criteria		0.18	2.88
BIS(2-CHLOROETHYL)ETHER	111444			No Criteria		5.3	84.8
BIS(2-CHLOROISOPROPYL)ETHER	108601			No Criteria		65000	1040000
BIS(2-ETHYLHEXYL)PHTHALATE	117817			No Criteria		22	352
BUTYL BENZYL PHTHALATE	85687			No Criteria		1900	30400
2-CHLORONAPHTHALENE	91587			No Criteria		1600	25600
1,2-DICHLOROBENZENE	95501			No Criteria		1300	20800
1,3-DICHLOROBENZENE	541731			No Criteria		960	15360
1,4-DICHLOROBENZENE	106467			No Criteria		190	3040
3,3-DICHLOROBENZIDENE	91941			No Criteria		0.28	4.48
DIETHYL PHTHALATE	84662			No Criteria		44000	704000
DIMETHYL PHTHALATE	131113			No Criteria		1100000	17600000
Di-n-BUTYL PHTHALATE	84742			No Criteria		4500	72000
2,4-DINITROTOLUENE	121142			No Criteria		34	544

CALCULATION OF WATER QUALITY BASED SALT WATER DISCHARGE LIMITS

FACILITY NAME: NBC - Fields Point WWTF RIPDES PERMIT #: RI0100315

NOTE: METALS CRITERIA ARE DISSOLVED, METALS LIMITS ARE TOTAL; AMMONIA CRITERIA AND LIMITS HAVE BEEN CONVERTED TO ug/l N.

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
1,2-DIPHENYLDRAZINE	122667			No Criteria		2	32
FLUORANTHENE	206440			No Criteria		140	2240
FLUORENE	86737			No Criteria		5300	84800
HEXACHLOROBENZENE	118741			No Criteria		0.0029	0.0464
HEXACHLOROBUTADIENE	87683			No Criteria		180	2880
HEXACHLOROCYCLOPENTADIENE	77474			No Criteria		1100	17600
HEXACHLOROETHANE	67721			No Criteria		33	528
ISOPHORONE	78591			No Criteria		9600	153600
NAPHTHALENE	91203			No Criteria			No Criteria
NITROBENZENE	98953			No Criteria		690	11040
NNITROSODIMETHYLAMINE	62759			No Criteria		30	480
NNITROSODINPROPYLAMINE	621647			No Criteria		5.1	81.6
NNITROSODIPHENYLAMINE	86306			No Criteria		60	960
PYRENE	129000			No Criteria		4000	64000
1,2,4-trichlorobenzene	120821			No Criteria		70	1120
PESTICIDES/PCBs							
ALDRIN	309002		1.3	5.2		0.0005	0.008
Alpha BHC	319846			No Criteria		0.049	0.784
Beta BHC	319857			No Criteria		0.17	2.72
Gamma BHC (Lindane)	58899		0.16	0.64		1.8	28.8
CHLORDANE	57749		0.09	0.36	0.004	0.0081	0.064
4,4DDT	50293		0.13	0.52	0.001	0.0022	0.016
4,4DDE	72559			No Criteria		0.0022	0.0352
4,4DDD	72548			No Criteria		0.0031	0.0496
DIELDRIN	60571		0.71	2.84	0.0019	0.00054	0.00864
ENDOSULFAN (alpha)	959988		0.034	0.136	0.0087	89	0.1392
ENDOSULFAN (beta)	33213659		0.034	0.136	0.0087	89	0.1392
ENDOSULFAN (sulfate)	1031078			No Criteria		89	1424
ENDRIN	72208		0.037	0.148	0.0023	0.06	0.0368
ENDRIN ALDEHYDE	7421934			No Criteria		0.3	4.8
HEPTACHLOR	76448		0.053	0.212	0.0036	0.00079	0.01264
HEPTACHLOR EPOXIDE	1024573		0.053	0.212	0.0036	0.00039	0.00624
POLYCHLORINATED BIPHENYLS3	1336363			No Criteria	0.03	0.00064	0.01024
2,3,7,8TCDD (Dioxin)	1746016		0.21	No Criteria	0.0002	0.000000051	0.000000816
TOXAPHENE	8001352		0.42	No Criteria	0.0074	0.0028	0.0032
TRIBUTYL TIN				1.68			0.1184

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: NBC - Fields Point WWTF RIPDES PERMIT #: RI0100315

NOTE: METALS CRITERIA ARE DISSOLVED. METALS LIMITS ARE TOTAL; AMMONIA CRITERIA AND LIMITS HAVE BEEN CONVERTED TO ug/l N.

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
NON PRIORITY POLLUTANTS:							
OTHER SUBSTANCES							
ALUMINUM (limits are total recoverable)	7429905	NA		No Criteria			No Criteria
AMMONIA as N (winter/summer)	7664417		25482	101928	3863		61814.4 14467.2
4BROMOPHENYL PHENYL ETHER				No Criteria			No Criteria
CHLORIDE	16887006			No Criteria			No Criteria
CHLORINE	7782505		13	65	7.5		150
4CHLORO2METHYLPHENOL				No Criteria			No Criteria
1CHLORONAPHTHALENE				No Criteria			No Criteria
4CHLOROPHENOL	106489			No Criteria			No Criteria
2,4DICHLORO6METHYLPHENOL				No Criteria			No Criteria
1,1DICHLOROPROPANE				No Criteria			No Criteria
1,3DICHLOROPROPANE	142289			No Criteria			No Criteria
2,3DINITROTOLUENE				No Criteria			No Criteria
2,4DINITRO6METHYL PHENOL				No Criteria			No Criteria
IRON	7439896			No Criteria			No Criteria
pentachlorobenzene	608935			No Criteria			No Criteria
PENTACHLOROETHANE				No Criteria			No Criteria
1,2,3,5tetrachlorobenzene				No Criteria			No Criteria
1,1,1,2TETRACHLOROETHANE	630206			No Criteria			No Criteria
2,3,4,6TETRACHLOROPHENOL	58902			No Criteria			No Criteria
2,3,5,6TETRACHLOROPHENOL				No Criteria			No Criteria
2,4,5TRICHLOROPHENOL	95954			No Criteria			No Criteria
2,4,6TRINITROPHENOL	88062			No Criteria			No Criteria
XYLENE	1330207			No Criteria			No Criteria

CALCULATION OF WATER QUALITY BASED SALT WATER DISCHARGE LIMITS

FACILITY NAME: NBC - Fields Point WWTF

RIPDES PERMIT #: RI0100315

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
PRIORITY POLLUTANTS			
TOXIC METALS AND CYANIDE			
ANTIMONY	7440360	No Criteria	10240.00
ARSENIC, TOTAL	7440382	306.34	5.44
ASBESTOS	1332214	No Criteria	No Criteria
BERYLLIUM	7440417	No Criteria	No Criteria
CADMIUM, TOTAL	7440439	192.36	168.70
CHROMIUM III, TOTAL	16065831	No Criteria	No Criteria
CHROMIUM VI, TOTAL	18540299	4983.80	901.14
COPPER, TOTAL	7440508	24.52	24.52
CYANIDE	57125	4.00	4.00
LEAD, TOTAL	7439921	4353.38	664.97
MERCURY, TOTAL	7439976	9.53	2.69
NICKEL, TOTAL	7440020	331.10	138.58
SELENIUM, TOTAL	7782492	1307.33	1279.23
SILVER, TOTAL	7440224	20.14	No Criteria
THALLIUM	7440280	No Criteria	7.52
ZINC, TOTAL	7440666	422.49	422.49
VOLATILE ORGANIC COMPOUNDS			
ACROLEIN	107028	No Criteria	4640.00
ACRYLONITRILE	107131	No Criteria	40.00
BENZENE	71432	No Criteria	8160.00
BROMOFORM	75252	No Criteria	22400.00
CARBON TETRACHLORIDE	56235	No Criteria	256.00
CHLOROBENZENE	108907	No Criteria	25600.00
CHLORODIBROMOMETHANE	124481	No Criteria	2080.00
CHLOROFORM	67663	No Criteria	75200.00
DICHLOROBROMOMETHANE	75274	No Criteria	2720.00
1,2DICHLOROETHANE	107062	No Criteria	5920.00
1,1DICHLOROETHYLENE	75354	No Criteria	113600.00
1,2DICHLOROPROPANE	78875	No Criteria	2400.00
1,3DICHLOROPROPYLENE	542756	No Criteria	336.00
ETHYLBENZENE	100414	No Criteria	33600.00
BROMOMETHANE (methyl bromide)	74839	No Criteria	24000.00
CHLOROMETHANE (methyl chloride)	74873	No Criteria	No Criteria
METHYLENE CHLORIDE	75092	No Criteria	94400.00
1,1,2,2TETRACHLOROETHANE	79345	No Criteria	640.00

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
TETRACHLOROETHYLENE	127184	No Criteria	528.00
TOLUENE	108883	No Criteria	240000.00
1,2TRANSDICHLOROETHYLENE	156605	No Criteria	160000.00
1,1,1TRICHLOROETHANE	71556	No Criteria	No Criteria
1,1,2TRICHLOROETHANE	79005	No Criteria	2560.00
TRICHLOROETHYLENE	79016	No Criteria	4800.00
VINYL CHLORIDE	75014	No Criteria	38.40
ACID ORGANIC COMPOUNDS			
2CHLOROPHENOL	95578	No Criteria	2400.00
2,4DICHLOROPHENOL	120832	No Criteria	4640.00
2,4DIMETHYLPHENOL	105679	No Criteria	13600.00
4,6DINITRO2METHYL PHENOL	534521	No Criteria	4480.00
2,4DINITROPHENOL	51285	No Criteria	84800.00
4NITROPHENOL	88755	No Criteria	No Criteria
PENTACHLOROPHENOL	87865	52.00	52.00
PHENOL	108952	No Criteria	27200000.00
2,4,6TRICHLOROPHENOL	88062	No Criteria	384.00
BASE NEUTRAL COMPOUNDS			
ACENAPHTHENE	83329	No Criteria	15840.00
ANTHRACENE	120127	No Criteria	640000.00
BENZIDINE	92875	No Criteria	0.03
PAHs		No Criteria	2.88
BIS(2CHLOROETHYL)ETHER	111444	No Criteria	84.80
BIS(2CHLOROISOPROPYL)ETHER	108601	No Criteria	1040000.00
BIS(2ETHYLHEXYL)PHTHALATE	117817	No Criteria	352.00
BUTYL BENZYL PHTHALATE	85687	No Criteria	30400.00
2CHLORONAPHTHALENE	91587	No Criteria	25600.00
1,2DICHLOROBENZENE	95501	No Criteria	20800.00
1,3DICHLOROBENZENE	541731	No Criteria	15360.00
1,4DICHLOROBENZENE	106467	No Criteria	3040.00
3,3DICHLOROBENZIDENE	91941	No Criteria	4.48
DIETHYL PHTHALATE	84662	No Criteria	704000.00
DIMETHYL PHTHALATE	131113	No Criteria	17600000.00
DI-n-BUTYL PHTHALATE	84742	No Criteria	72000.00
2,4DINITROTOLUENE	121142	No Criteria	544.00
1,2DIPHENYLHYDRAZINE	122667	No Criteria	32.00
FLUORANTHENE	206440	No Criteria	2240.00

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS
RIPDES PERMIT #: RI0100315

FACILITY NAME: NBC - Fields Point WWTF

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
FLUORENE	86737	No Criteria	84800.00
HEXACHLOROBENZENE	118741	No Criteria	0.05
HEXACHLOROBUTADIENE	87683	No Criteria	2880.00
HEXACHLOROCYCLOPENTADIENE	77474	No Criteria	17600.00
HEXACHLOROETHANE	67721	No Criteria	528.00
ISOPHORONE	78591	No Criteria	153600.00
NAPHTHALENE	91203	No Criteria	No Criteria
NITROBENZENE	98953	No Criteria	11040.00
N-NITROSODIMETHYLAMINE	62759	No Criteria	480.00
N-NITROSODI-N-PROPYLAMINE	621647	No Criteria	81.60
N-NITROSODIPHENYLAMINE	86306	No Criteria	960.00
PYRENE	129000	No Criteria	64000.00
1,2,4trichlorobenzene	120821	No Criteria	1120.00
PESTICIDES/PCBs			
ALDRIN	309002	5.20	0.01
Alpha BHC	319846	No Criteria	0.78
Beta BHC	319857	No Criteria	2.72
Gamma BHC (Lindane)	58899	0.64	0.64
CHLORDANE	57749	0.36	0.06
4,4DDT	50293	0.52	0.02
4,4DDE	72559	No Criteria	0.04
4,4DDD	72548	No Criteria	0.05
DIELDRIN	60571	2.84	0.01
ENDOSULFAN (alpha)	959988	0.14	0.14
ENDOSULFAN (beta)	33213659	0.14	0.14
ENDOSULFAN (sulfate)	1031078	No Criteria	1424.00
ENDRIN	72208	0.15	0.04
ENDRIN ALDEHYDE	7421934	No Criteria	4.80
HEPTACHLOR	76448	0.21	0.01
HEPTACHLOR EPOXIDE	1024573	0.21	0.01
POLYCHLORINATED BIPHENYLS3	1336363	No Criteria	0.01
2,3,7,8TCDD (Dioxin)	1746016	No Criteria	0.00
TOXAPHENE	8001352	0.84	0.00
TRIBUTYL TIN		1.68	0.12

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
NON PRIORITY POLLUTANTS			
OTHER SUBSTANCES			
ALUMINUM, TOTAL	7429905	No Criteria	No Criteria
AMMONIA (as N), WINTER (NOV-APR)	7664417	101928.00	61814.40
AMMONIA (as N), SUMMER (MAY-OC)	7664417	24660.00	14467.20
4BROMOPHENYL PHENYL ETHER		No Criteria	No Criteria
CHLORIDE	16887006	No Criteria	No Criteria
CHLORINE	7782505	65.00	65.00
4CHLORO2METHYLPHENOL		No Criteria	No Criteria
1CHLORONAPHTHALENE		No Criteria	No Criteria
4CHLOROPHENOL	106489	No Criteria	No Criteria
2,4DICHLORO6METHYLPHENOL		No Criteria	No Criteria
1,1DICHLOROPROPANE		No Criteria	No Criteria
1,3DICHLOROPROPANE	142289	No Criteria	No Criteria
2,3DINITROTOLUENE		No Criteria	No Criteria
2,4DINITRO6METHYL PHENOL		No Criteria	No Criteria
IRON		No Criteria	No Criteria
pentachlorobenzene	7439896	No Criteria	No Criteria
PENTACHLOROETHANE	608935	No Criteria	No Criteria
1,2,3,5tetrachlorobenzene		No Criteria	No Criteria
1,1,1,2TETRACHLOROETHANE	630206	No Criteria	No Criteria
2,3,4,6TETRACHLOROPHENOL	58902	No Criteria	No Criteria
2,3,5,6TETRACHLOROPHENOL		No Criteria	No Criteria
2,4,5TRICHLOROPHENOL	95954	No Criteria	No Criteria
2,4,6TRINITROPHENOL	88062	No Criteria	No Criteria
XYLENE	1330207	No Criteria	No Criteria

ATTACHMENT A-5
Calculation of Historic Discharge Levels

MONTHLY AVERAGE AND DAILY MAXIMUM PERMIT LIMIT CALCULATIONS
 FOR LESS THAN TEN SAMPLES TSD pgE-18 and pg E-16

WITH SOME MEASUREMENTS < DETECTION LIMIT (based on a delta-lognormal distribution)

n := 8 Number of times the permittee will sample per month
 k := 50 Sample size of the data set
 NA D := 0 Detection Limit l := 0, 1 .. 1 Counter
 r := 0 Number of nondetects i := 1, 2 .. k - r Counter
 $\delta := \frac{r}{k}$

$Area_{95} := \frac{.95 - \delta}{1 - \delta}$ $Area_{95} = 0.95$ $Area_{99} := \frac{.99 - \delta}{1 - \delta}$ $Area_{99} = 0.99$

$z_{99} := 2.33$ $z_{95} := 1.65$ Find from Table A-4 and insert Areas from the table

$x_i :=$ Daily data is best, use monthly averages if necessary

11.6
12.1
9.2
10.2
10.5
9.9
13.3
11.2
13.3
11.6
10.6
7.4
8.4
7.9
7.5
6.5
5.2
8.1
5
4.4
4.95
4.8
4.1
3.68
6.17
3.7
2.77
2.47
3.19
2.75
2.7
3.89
2.97
4.27
2.8
2.3

$y_i := \ln(x_i)$

$\mu_y := \sum_i \frac{y_i}{k - r}$

$\sigma_y := \sqrt{\sum_i \frac{(y_i - \mu_y)^2}{k - r - 1}}$

$E(x) := \delta \cdot D + (1 - \delta) \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2)$

$V(x) := (1 - \delta) \cdot \exp(2 \cdot \mu_y + \sigma_y^2) \cdot \left[\exp(\sigma_y^2) - (1 - \delta) \right] + \delta \cdot (1 - \delta) \cdot D \cdot (D - 2 \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2))$

$A := \frac{V(x)}{[n \cdot (E(x) - \delta^n \cdot D)]^2}$ $B := \frac{(\delta^n \cdot D^2) \cdot (1 - \delta^n) - 1}{(E(x) - \delta^n \cdot D)^2}$ $C := \frac{2 \cdot \delta^n \cdot D}{(E(x) - \delta^n \cdot D)}$

$\sigma_n := \sqrt{\ln[(1 - \delta^n) \cdot (1 + A + B + C)]}$ $\mu_n := \ln \left[\frac{E(x) - \delta^n \cdot D}{(1 - \delta^n)} \right] - 0.5 \cdot \sigma_n^2$

Compare₁ :=

$\exp(\mu_n + z_{95} \cdot \sigma_n)$
D

$X_{95} := \max(\text{Compare}_1)$

Compare₂ :=

$\exp(\mu_y + z_{99} \cdot \sigma_y)$
D

$X_{99} := \max(\text{Compare}_2)$

$X_{95} = 8.4$ monthly average interim limit $X_{99} = 22.2$ daily maximum interim limit

interim limits Field's Point Copper 012215.mcd

1.99
1.9
1.47
1.44
1.54
1.42
1.71
1.8
4.62
2.9
2.38
2.12
1.78
1.47

interim limits Field's Point Copper 012215.mcd

MONTHLY AVERAGE AND DAILY MAXIMUM PERMIT LIMIT CALCULATIONS FOR LESS THAN TEN SAMPLES TSD pg E-18 and pg E-16

WITH SOME MEASUREMENTS < DETECTION LIMIT (based on a delta-lognormal distribution)

n := 1 Number of times the permittee will sample per month
 k := 60 Sample size of the data set
 ASSUMED D := 0.01 Detection Limit l := 0, 1 .. l Counter
 r := 40 Number of nondetects i := 1, 2 .. k - r Counter
 $\delta := \frac{r}{k}$

$Area_{95} := \frac{.95 - \delta}{1 - \delta}$ $Area_{95} = 0.85$ $Area_{99} := \frac{.99 - \delta}{1 - \delta}$ $Area_{99} = 0.97$

$z_{99} := 1.89$ $z_{95} := 1.04$ Find from Table A-4 and insert Areas from the table

$x_i :=$ Daily data is best, use monthly averages if necessary

0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01
0.01

$y_i := \ln(x_i)$

$\mu_y := \sum_i \frac{y_i}{k - r}$

$\sigma_y := \sqrt{\sum_i \frac{(y_i - \mu_y)^2}{k - r - 1}}$

$E(x) := \delta \cdot D + (1 - \delta) \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2)$

$V(x) := (1 - \delta) \cdot \exp(2 \cdot \mu_y + \sigma_y^2) \cdot [\exp(\sigma_y^2) - (1 - \delta)] \dots$
 $+ \delta \cdot (1 - \delta) \cdot D \cdot (D - 2 \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2))$

$A := \frac{V(x)}{[n \cdot (E(x) - \delta^n \cdot D)^2]}$ $B := \frac{(\delta^n \cdot D^2) \cdot (1 - \delta^n) - 1}{(E(x) - \delta^n \cdot D)^2}$ $C := \frac{2 \cdot \delta^n \cdot D}{(E(x) - \delta^n \cdot D)}$

$\sigma_n := \sqrt{\ln[(1 - \delta^n) \cdot (1 + A + B + C)]}$ $\mu_n := \ln\left[\frac{E(x) - \delta^n \cdot D}{(1 - \delta^n)}\right] - 0.5 \cdot \sigma_n^2$

Compare₁ :=

$\exp(\mu_n + z_{95} \cdot \sigma_n)$
D

$X_{95} := \max(\text{Compare})$

Compare₂ :=

$\exp(\mu_y + z_{99} \cdot \sigma_y)$
D

$X_{99} := \max(\text{Compare2})$

$X_{95} = 0.01$ monthly average interim limit $X_{99} = 0.01$ daily maximum interim limit

MONTHLY AVERAGE AND DAILY MAXIMUM PERMIT LIMIT CALCULATIONS
FOR LESS THAN TEN SAMPLES TSD pg E-18 and pg E-16

WITH SOME MEASUREMENTS < DETECTION LIMIT (based on a delta-lognormal distribution)

n := 8 Number of times the permittee will sample per month
 k := 50 Sample size of the data set
 NA D := 0 Detection Limit l := 0, 1 .. 1 Counter
 r := 0 Number of nondetects i := 1, 2 .. k - r Counter
 $\delta := \frac{r}{k}$

$Area_{95} := \frac{.95 - \delta}{1 - \delta}$ $Area_{95} = 0.95$ $Area_{99} := \frac{.99 - \delta}{1 - \delta}$ $Area_{99} = 0.99$

$z_{99} := 2.33$ $z_{95} := 1.65$ Find from Table A-4 and insert Areas from the table

$x_i :=$ Daily data is best, use monthly averages if necessary

15.2
14.9
13.7
16.8
30.1
17.2
16.5
20.1
39.1
22.9
22.5
17.3
22.4
20.4
27.6
18.4
12.4
13
12.9
12
13.4
17
26.9
17
12.9
15.2
11.4
15.5
20.2
12.4
13.6
12.36
11.16
12.63
15
11.2

$y_i := \ln(x_i)$

$\mu_y := \sum_i \frac{y_i}{k - r}$

$\sigma_y := \sqrt{\sum_i \frac{(y_i - \mu_y)^2}{k - r - 1}}$

$E(x) := \delta \cdot D + (1 - \delta) \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2)$

$V(x) := (1 - \delta) \cdot \exp(2 \cdot \mu_y + \sigma_y^2) \cdot \left[\exp(\sigma_y^2) - (1 - \delta) \right] + \delta \cdot (1 - \delta) \cdot D \cdot (D - 2 \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2))$

$A := \frac{V(x)}{[n \cdot (E(x) - \delta^n \cdot D)^2]}$ $B := \frac{(\delta^n \cdot D^2) \cdot (1 - \delta^n) - 1}{(E(x) - \delta^n \cdot D)^2}$ $C := \frac{2 \cdot \delta^n \cdot D}{(E(x) - \delta^n \cdot D)}$

$\sigma_n := \sqrt{\ln[(1 - \delta^n) \cdot (1 + A + B + C)]}$

$\mu_n := \ln\left[\frac{E(x) - \delta^n \cdot D}{(1 - \delta^n)}\right] - 0.5 \cdot \sigma_n^2$

Compare₁ :=

$\exp(\mu_n + z_{95} \cdot \sigma_n)$
D

$X_{95} := \max(\text{Compare})$

Compare2₁ :=

$\exp(\mu_y + z_{99} \cdot \sigma_y)$
D

$X_{99} := \max(\text{Compare2})$

$X_{95} = 18.9$ monthly average interim limit $X_{99} = 32$ daily maximum interim limit

interim limits Field's Point nickel 012215.mcd

12.2
9.3
8.5
8.5
10.68
10.16
11.63
13.96
17.51
13.68
12.51
10.41
9.78
9.32

interim limits Field's Point nickel 012215.mcd

MONTHLY AVERAGE AND DAILY MAXIMUM PERMIT LIMIT CALCULATIONS
 FOR LESS THAN TEN SAMPLES TSD pg E-18 and pg E-16

WITH SOME MEASUREMENTS < DETECTION LIMIT (based on a delta-lognormal distribution)

n := 1 Number of times the permittee will sample per month
 k := 50 Sample size of the data set
 NA D := 0 Detection Limit l := 0, 1 .. 1 Counter
 r := 0 Number of nondetects i := 1, 2 .. k - r Counter
 $\delta := \frac{r}{k}$

$Area_{95} := \frac{.95 - \delta}{1 - \delta}$ $Area_{95} = 0.95$ $Area_{99} := \frac{.99 - \delta}{1 - \delta}$ $Area_{99} = 0.99$

$z_{99} := 2.33$ $z_{95} := 1.65$ Find from Table A-4 and insert Areas from the table

$x_i :=$ Daily data is best, use monthly averages if necessary

24
27.2
33.1
40
25.7
23.5
31.4
33.7
30.6
40.3
34.6
32.9
30
23.1
25.2
27.2
22.4
22
21
19.3
22.4
24.9
30.1
24.2
22.4
17.6
11.83
15.06
13.2
17.7
19.6
21.04
20.67
25.98
21.4
19.5

$y_i := \ln(x_i)$

$\mu_y := \sum_i \frac{y_i}{k - r}$

$\sigma_y := \sqrt{\sum_i \frac{(y_i - \mu_y)^2}{k - r - 1}}$

$E(x) := \delta \cdot D + (1 - \delta) \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2)$

$V(x) := (1 - \delta) \cdot \exp(2 \cdot \mu_y + \sigma_y^2) \cdot [\exp(\sigma_y^2) - (1 - \delta)] + \delta \cdot (1 - \delta) \cdot D \cdot (D - 2 \cdot \exp(\mu_y + 0.5 \cdot \sigma_y^2))$

$A := \frac{V(x)}{[n \cdot (E(x) - \delta^n \cdot D)]^2}$ $B := \frac{(\delta^n \cdot D^2) \cdot (1 - \delta^n) - 1}{(E(x) - \delta^n \cdot D)^2}$ $C := \frac{2 \cdot \delta^n \cdot D}{(E(x) - \delta^n \cdot D)}$

$\sigma_n := \sqrt{\ln[(1 - \delta^n) \cdot (1 + A + B + C)]}$ $\mu_n := \ln\left[\frac{E(x) - \delta^n \cdot D}{(1 - \delta^n)}\right] - 0.5 \cdot \sigma_n^2$

Compare₁ :=

$\exp(\mu_n + z_{95} \cdot \sigma_n)$
D

$X_{95} := \max(\text{Compare})$

Compare2₁ :=

$\exp(\mu_y + z_{99} \cdot \sigma_y)$
D

$X_{99} := \max(\text{Compare2})$

$X_{95} = 35.8$ monthly average interim limit $X_{99} = 43.3$ daily maximum interim limit

interim limits Field's Point zinc 012215.mcd

19.8
16.3
14.3
14.93
16.64
20.23
23.04
23.99
24.09
26.4
24.87
22.89
16.48
14.71

interim limits Field's Point zinc 012215.mcd

ATTACHMENT A-6

**Calculation of Allowable Chronic Discharge Limitations
Based on an Analysis Considering Antidegradation and Antibacksliding**

Facility : NBC Field's Point WWTF
 Parameter : Copper

Input required data (use N/A when data is not available):

Chronic Metals Translator :	0.818
Previous monthly average limit (Total) :	23 ug/L
Historical discharge concentration (Total) :	8.4 ug/L
Waterbody background concentration (Dissolved) :	0.385 ug/L
Facility chronic dilution factor :	20 x
Chronic criteria (Dissolved) :	3.1 ug/L
Remaining Assimilative Capacity to be Allocated :	20 %

Note: 20 % of the remaining assimilative capacity was allocated because NBC Field's Point has a well running approved pretreatment program and the facility has been given an excellent rating by the Department

Determine existing water quality:

$$C_p = \frac{(DF - 1) \cdot C_b + 1 \cdot (C_d \cdot MT)}{DF} = 1.30645 \text{ ug/L}$$

DF = Chronic Dilution Factor Cb = Background Data (Dissolved)
 Cd = Maximum of Historical Data or Previous Monthly Limit
 MT = Metals Translator (Use RI Conversion Factor if Site-Specific is Unavailable)

Since the resulting instream concentration is less than the chronic criteria, the water body is attaining and pursuant to 303(d)(4)(b) backsliding is only possible if the requirements of antidegradation can be met.

Calculation of the new chronic permit limit:

Crac = Ccriteria - Cp	=	1.79355 ug/L	
Proposed Limit = (Cp + %*Crac)*DF - (DF-1)*Cb =		25.9882 ug/L	Dissolved
Proposed Limit = (Proposed Dissolved Limit/MT) =		31.77041565 ug/L	Total
Traditional Limit =		24.52 ug/L	

The antidegradation permit limit is greater than the limit which would result from using traditional procedures. Therefore, use the traditional chronic permit limit.

Chronic limit = 24.52 ug/L

Calculation of the new acute permit limit:

Acute Limit = 24.52 ug/L

Final Limits:

MONTHLY AVERAGE PERMIT LIMIT :	24.52 ug/L
DAILY MAXIMUM PERMIT LIMIT :	24.52 ug/L

Facility : NBC Field's Point WWTF
 Parameter : Nickel

Input required data (use N/A when data is not available):

Chronic Metals Translator	:	1
Previous monthly average limit (Total)	:	127 ug/L
Historical discharge concentration (Total)	:	18.9 ug/L
Waterbody background concentration (Dissolved)	:	0.475 ug/L
Facility chronic dilution factor	:	20 x
Chronic criteria (Dissolved)	:	8.2 ug/L
Remaining Assimilative Capacity to be Allocated	:	0 %

Note: 0 % of the remaining assimilative capacity was allocated at NBC Field's Point because historic levels were well below the previous limit.

Determine existing water quality:

$$C_p = \frac{(DF - 1) * C_b + 1 * (C_d * MT)}{DF} = 6.80125 \text{ ug/L}$$

DF = Chronic Dilution Factor
 Cb = Background Data (Dissolved)
 Cd = Maximum of Historical Data or Previous Monthly Limit
 MT = Metals Translator (Use RI Conversion Factor if Site-Specific is Unavailable)

Since the resulting instream concentration is less than the chronic criteria, the water body is attaining and pursuant to 303(d)(4)(b) backsliding is only possible if the requirements of antidegradation can be met.

Calculation of the new chronic permit limit:

Crac = Ccriteria - Cp	=	1.39875 ug/L
Proposed Limit = (Cp + %*Crac)*DF - (DF-1)*Cb =		127 ug/L
Proposed Limit = (Proposed Dissolved Limit/MT) =		127 ug/L
		Dissolved
Traditional Limit =		138.58 ug/L
		Total

The antidegradation permit limit is less than the limit which would result from using traditional procedures. Therefore, use the antidegradation permit limit.

Chronic limit = 127 ug/L

Calculation of the new acute permit limit:

Acute Limit = 331.10 ug/L

Final Limits:

MONTHLY AVERAGE PERMIT LIMIT	:	127 ug/L
DAILY MAXIMUM PERMIT LIMIT	:	331.10 ug/L

Facility : NBC Field's Point WWTF
 Parameter : Zinc

Input required data (use N/A when data is not available):

Chronic Metals Translator :	0.946	
Previous monthly average limit (Total) :	380 ug/L	
Historical discharge concentration (Total) :	35.8 ug/L	
Waterbody background concentration (Dissolved) :	1.33 ug/L	
Facility chronic dilution factor :	20 x	
Chronic criteria (Dissolved) :	81 ug/L	
Remaining Assimilative Capacity to be Allocated :	0 %	

Note: 0 % of the remaining assimilative capacity was allocated at NBC Field's Point because historic levels were well below the previous limit.

Determine existing water quality:

$$C_p = \frac{(DF - 1) \cdot C_b + 1 \cdot (C_d \cdot MT)}{DF} = 19.2375 \text{ ug/L}$$

DF = Chronic Dilution Factor

Cb = Background Data (Dissolved)

Cd = Maximum of Historical Data or Previous Monthly Limit

MT = Metals Translator (Use RI Conversion Factor if Site-Specific is Unavailable)

Since the resulting instream concentration is less than the chronic criteria, the water body is attaining and pursuant to 303(d)(4)(b) backsliding is only possible if the requirements of antidegradation can be met.

Calculation of the new chronic permit limit:

$$C_{rac} = C_{criteria} - C_p = 61.7625 \text{ ug/L}$$

Proposed Limit = $(C_p + \% \cdot C_{rac}) \cdot DF - (DF - 1) \cdot C_b =$	359.48 ug/L	Dissolved
Proposed Limit = (Proposed Dissolved Limit/MT) =	380 ug/L	Total

$$\text{Traditional Limit} = 422.49 \text{ ug/L}$$

The antidegradation permit limit is less than the limit which would result from using traditional procedures. Therefore, use the antidegradation permit limit.

$$\text{Chronic limit} = 380 \text{ ug/L}$$

Calculation of the new acute permit limit:

$$\text{Acute Limit} = 422.49 \text{ ug/L}$$

Final Limits:

MONTHLY AVERAGE PERMIT LIMIT :	380 ug/L
DAILY MAXIMUM PERMIT LIMIT :	422.49 ug/L

ATTACHMENT A-7

**Summary of Detected State User Fee Data*
July 2007 to November 2011**

Item #	Cycle	Date	Parameter	Conc., ug/L	min/max	n	tot	ave
1	20	6/3/2008	Antimony, Total	2	max	1	2	2.0
2	19	7/25/2007	Arsenic	1	min	1	1	
3	21	4/14/2010	Arsenic	1		2	2	
4	22	5/20/2010	Arsenic	1		3	3	
5	22	5/5/2010	Arsenic	1		4	4	
6	24	7/19/2011	Arsenic	1		5	5	
7	20	10/16/2007	Arsenic	2		6	7	
8	21	10/28/2009	Arsenic	2		7	9	
9	23	9/14/2010	Arsenic	2	max	8	11	1.4
10	21	4/14/2010	BOD	4000	min	1	4000	
11	24	11/28/2011	BOD	5000		2	9000	
12	24	7/19/2011	BOD	6000		3	15000	
13	20	10/16/2007	BOD	7000		4	22000	
14	21	10/28/2009	BOD	7000		5	29000	
15	19	7/25/2007	BOD	9000		6	38000	
16	23	9/14/2010	BOD	9000		7	47000	
17	20	6/3/2008	BOD	11000		8	58000	
18	22	5/5/2010	BOD	15000		9	73000	
19	22	5/20/2010	BOD	17000		10	90000	
20	23	11/4/2010	BOD	29000	max	11	119000	10818.2
21	20	10/16/2007	Dibromochloromethane	1.4	min	1	1.4	
22	20	10/16/2007	Bromodichloromethane	1.7	max	2	3.1	1.6
23	24	11/28/2011	Chloroform	1.3	min	1	1.3	
24	23	9/14/2010	Chloroform	1.9		2	3.2	
25	22	5/20/2010	Chloroform	2		3	5.2	
26	24	7/19/2011	Chloroform	2		4	7.2	
27	20	10/16/2007	Chloroform	2.1		5	9.3	
28	21	4/14/2010	Chloroform	2.1		6	11.4	
29	21	10/28/2009	Chloroform	2.3		7	13.7	
30	19	7/25/2007	Chloroform	2.4		8	16.1	
31	22	5/5/2010	Chloroform	2.5		9	18.6	
32	20	6/3/2008	Chloroform	2.8		10	21.4	
33	23	11/4/2010	Chloroform	2.9	max	11	24.3	2.2
34	21	10/28/2009	Chromium, Total	1	min	1	1	
35	24	11/28/2011	Chromium, Total	1		2	2	
36	19	7/25/2007	Chromium, Total	2		3	4	
37	20	10/16/2007	Chromium, Total	2		4	6	
38	22	5/20/2010	Chromium, Total	2		5	8	
39	23	9/14/2010	Chromium, Total	2		6	10	
40	23	11/4/2010	Chromium, Total	2		7	12	
41	24	7/19/2011	Chromium, Total	2		8	14	
42	22	5/5/2010	Chromium, Total	4		9	18	
43	20	6/3/2008	Chromium, Total	18	max	10	36	3.6
44	24	11/28/2011	Copper, Total	6	min	1	6	
45	21	4/14/2010	Copper, Total	8		2	14	
46	23	9/14/2010	Copper, Total	9		3	23	
47	24	7/19/2011	Copper, Total	9		4	32	
48	21	10/28/2009	Copper, Total	10		5	42	

Item #	Cycle	Date	Parameter	Conc., ug/L	min/max	n	tot	ave
49	22	5/20/2010	Copper, Total	10		6	52	
50	22	5/5/2010	Copper, Total	12		7	64	
51	19	7/25/2007	Copper, Total	13		8	77	
52	20	10/16/2007	Copper, Total	13		9	90	
53	23	11/4/2010	Copper, Total	17		10	107	
54	20	6/3/2008	Copper, Total	24	max	11	131	11.9
55	24	11/28/2011	Cyanide	5.6	min	1	5.6	
56	19	7/25/2007	Cyanide	10		2	15.6	
57	20	6/3/2008	Cyanide	20		3	35.6	
58	20	10/16/2007	Cyanide	40		4	75.6	
59	21	10/28/2009	Cyanide	50	max	5	125.6	25.1
22	21	4/14/2010	Diethyl Phthalate	11.5	max	1	11.5	11.5
23	20	10/16/2007	Lead, Total	1	min	1	1	
24	23	9/14/2010	Lead, Total	1		2	2	
25	21	10/28/2009	Lead, Total	2		3	4	
26	22	5/5/2010	Lead, Total	2		4	6	
27	22	5/20/2010	Lead, Total	2		5	8	
28	20	6/3/2008	Lead, Total	3	max	6	11	1.8
29	22	5/20/2010	Nickel, Total	14	min	1	14	
30	24	11/28/2011	Nickel, Total	14		2	28	
31	23	11/4/2010	Nickel, Total	17		3	45	
32	20	10/16/2007	Nickel, Total	18		4	63	
33	20	6/3/2008	Nickel, Total	21		5	84	
34	21	4/14/2010	Nickel, Total	21		6	105	
35	23	9/14/2010	Nickel, Total	21		7	126	
36	22	5/5/2010	Nickel, Total	22		8	148	
37	24	7/19/2011	Nickel, Total	24		9	172	
38	19	7/25/2007	Nickel, Total	26		10	198	
39	21	10/28/2009	Nickel, Total	162	max	11	360	32.7
40	24	11/28/2011	Selenium, Total	2	min	1	2	
41	21	4/14/2010	Selenium, Total	3		2	5	
42	21	10/28/2009	Selenium, Total	3		3	8	
43	24	7/19/2011	Selenium, Total	3		4	11	
44	22	5/5/2010	Selenium, Total	3		5	14	
45	19	7/25/2007	Selenium, Total	4		6	18	
46	22	5/20/2010	Selenium, Total	4		7	22	
47	23	9/14/2010	Selenium, Total	4		8	26	
48	23	11/4/2010	Selenium, Total	4		9	30	
49	20	10/16/2007	Selenium, Total	7	max	10	37	3.7
50	22	5/20/2010	Settleable Solids	0.2	max	1	0.2	0.2
51	22	5/20/2010	Tetrachloroethene	1	min	1	1	
52	21	4/14/2010	Tetrachloroethene	1.5	max	2	2.5	1.3
53	22	5/5/2010	Toluene	1	min	1	1	
54	24	7/19/2011	Toluene	1.5	max	2	2.5	1.3
55	21	4/14/2010	TSS	3200	min	1	3200	
56	21	10/28/2009	TSS	10000		2	13200	
57	24	11/28/2011	TSS	11000		3	24200	
58	19	7/25/2007	TSS	12000		4	36200	

Item #	Cycle	Date	Parameter	Conc., ug/L	min/max	n	tot	ave
59	24	7/19/2011	TSS	12000		5	48200	
60	20	6/3/2008	TSS	13000		6	61200	
61	23	9/14/2010	TSS	16000		7	77200	
62	20	10/16/2007	TSS	19000		8	96200	
63	22	5/20/2010	TSS	21000		9	117200	
64	23	11/4/2010	TSS	21000		10	138200	
65	22	5/5/2010	TSS	24000	max	11	162200	14745.5
66	24	11/28/2011	Zinc, Total	20	min	1	20	
67	24	7/19/2011	Zinc, Total	21		2	41	
68	19	7/25/2007	Zinc, Total	25		3	66	
69	23	9/14/2010	Zinc, Total	25		4	91	
70	22	5/20/2010	Zinc, Total	26		5	117	
71	22	5/5/2010	Zinc, Total	27		6	144	
72	21	10/28/2009	Zinc, Total	30		7	174	
73	20	10/16/2007	Zinc, Total	37		8	211	
74	23	11/4/2010	Zinc, Total	41		9	252	
75	20	6/3/2008	Zinc, Total	42	max	10	294	29.4

y

ATTACHMENT A-8

**Summary of Discharge Monitoring Report Data
July 2009 – June 2014**

No Associated Facility Interest
DMR Data Summary 10/27/14

***** NOT ICIS CERTIFIED*****

001A

BOD, 5-day, 20 deg. C Location= 1

	MO AVG lb/d	DAILY MX lb/d
Mean	4052.6335	8359.702
Minimum	663.04	903.44
Maximum	9749.	20944.
Data Count	60	60

	MO AVG mg/L	WKLY AVG mg/L	DAILY MX mg/L
Mean	10.5885	12.2338	17.805
Minimum	2.44	2.54	3.17
Maximum	21.	25.	38.
Data Count	60	60	60

Chlorine, total residual Location= 1

	MO AVG ug/L	DAILY MX ug/L	
Mean	4.3532	15.7368	
Minimum	.	2.8	<i>note: Minimum = MDL=0</i>
Maximum	12.7	55.74	
Data Count	60	60	

Coliform, fecal general Location= 1

	MO GEO MPN/100mL	WKLY GEO MPN/100mL	DAILY MX MPN/100mL
Mean	13.6217	26.1817	85.9083
Minimum	2.	2.1	2.5
Maximum	68.	176.	541.
Data Count	60	60	60

Copper, total [as Cu] Location= 1

	MO AVG ug/L	DAILY MX ug/L
Mean	6.3125	9.2085
Minimum	1.42	1.6
Maximum	14.6	30.7
Data Count	60	60

Cyanide, total [as CN] Location= 1

	MO AVG ug/L	DAILY MX ug/L	
Mean	1.5328	4.1858	
Minimum	.	.	<i>note: Minimums = MDL=0</i>
Maximum	5.8	18.4	
Data Count	60	60	

Flow, in conduit or thru treatment plant

	30DA AVG MGD	DAILY MX MGD
Mean	44.7578	65.046
Minimum	31.15	34.22
Maximum	66.4	77.28
Data Count	60	60

Mercury, total [as Hg] Location= 1

	MO AVG ug/L	DAILY MX ug/L
Mean	.0043	.0076
Minimum	.0007	.0022
Maximum	.0144	.0263
Data Count	60	60

Nickel, total [as Ni] Location= 1

	MO AVG ug/L	DAILY MX ug/L
Mean	16.3282	24.552
Minimum	8.5	10.1
Maximum	39.1	116.
Data Count	60	60

Nitrogen, ammonia total [as N] Locatio

	MO AVG mg/L	DAILY MX mg/L
Mean	5.9706	8.4485
Minimum	.009	.104
Maximum	15.04	18.9
Data Count	30	30

Nitrogen, Kjeldahl, total [as N] Locatio

	MO AVG mg/L	DAILY MX mg/L
Mean	7.9136	11.0238
Minimum	.82	1.05
Maximum	19.8	35.3
Data Count	60	60

Nitrogen, nitrate total [as N] Location=

	MO AVG mg/L	DAILY MX mg/L
Mean	1.8452	3.2596
Minimum	.038	.15
Maximum	5.96	11.63
Data Count	60	60

Nitrogen, nitrite total [as N] Location=

	MO AVG mg/L	DAILY MX mg/L
Mean	5.6771	.8555
Minimum	.	.
Maximum	314.	3.56
Data Count	60	60

note: Minimums = MDL=0

Nitrogen, total [as N] Location= 1

	MO AVG lb/d
Mean	3753.6983
Minimum	959.1
Maximum	6501.

Data Count 60

	MO AVG mg/L	DAILY MX mg/L
Mean	10.1558	13.487
Minimum	3.18	4.04
Maximum	18.3	37.
Data Count	60	60

Oil & Grease Location= 1

	MO AVG mg/L	DAILY MX mg/L
Mean	1.1488	1.155
Minimum	.	.
Maximum	5.93	6.3
Data Count	60	60

note: Minimums = MDL=0

pH Location= 1

	MINIMUM SU	MAXIMUM SU
Mean	6.2945	7.2027
Minimum	5.87	6.89
Maximum	6.7	7.8
Data Count	60	60

Phosphorus, total [as P] Location= 1

	MO AVG mg/L	DAILY MX mg/L
Mean	1.3477	2.0535
Minimum	.59	.94
Maximum	1.998	3.49
Data Count	60	60

Silver, total [as Ag] Location= 1

	MO AVG ug/L	DAILY MX ug/L
Mean	.1172	.2529
Minimum	.	.03
Maximum	.705	2.83
Data Count	60	60

note: Minimum = MDL=0

Solids, settleable Location= 1

	WKLY AVG mL/L	DAILY MX mL/L
Mean	.0712	.2567
Minimum	.	.
Maximum	1.4	5.
Data Count	60	60

note: Minimums = MDL=0

Solids, total suspended Location= 1

	MO AVG lb/d	DAILY MX lb/d
Mean	3605.1278	8254.8708
Minimum	836.1	3139.
Maximum	7157.	19919.
Data Count	60	60

	MO AVG mg/L	WKLY AVG mg/L	DAILY MX mg/L
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Mean	9.46	11.1905	17.9848
Minimum	2.5	4.6	7.7
Maximum	19.	21.	35.
Data Count	60	60	60

Zinc, total [as Zn] Location= 1

	MO AVG ug/L	DAILY MX ug/L
Mean	23.8408	31.0355
Minimum	11.83	15.16
Maximum	40.3	110.
Data Count	60	60

BOD, 5-day, 20 deg. C Location= G

	MO AVG lb/d	DAILY MX lb/d
Mean	64752.8052	79261.3382
Minimum	50161.	63296.
Maximum	515651.1	118415.
Data Count	60	60

	MO AVG mg/L	WKLY AVG mg/L	DAILY MX mg/L
Mean	159.1388	178.2705	215.1018
Minimum	99.	126.	149.
Maximum	216.95	223.08	308.
Data Count	60	60	60

Copper, total [as Cu] Location= G

	MO AVG ug/L	DAILY MX ug/L
Mean	39.6042	55.7698
Minimum	23.1	27.6
Maximum	56.99	115.
Data Count	60	60

Cyanide, total [as CN] Location= G

	MO AVG ug/L	DAILY MX ug/L
Mean	7.8176	28.3633
Minimum	.	.
Maximum	46.25	294.6
Data Count	60	60

note: Minimums = MDL=0

Flow, in conduit or thru treatment plant

	30DA AVG MGD	DAILY MX MGD
Mean	45.3097	71.0893
Minimum	31.16	34.22
Maximum	77.08	147.81
Data Count	60	60

Mercury, total [as Hg] Location= G

	MO AVG ug/L	DAILY MX ug/L
Mean	.0515	.1071
Minimum	.0139	.0392
Maximum	.2333	.437
Data Count	60	60

Nickel, total [as Ni] Location= G

	MO AVG ug/L	DAILY MX ug/L
Mean	22.7398	38.8398
Minimum	14.59	18.1
Maximum	49.8	154.
Data Count	60	60

Silver, total [as Ag] Location= G

	MO AVG ug/L	DAILY MX ug/L
Mean	1.1392	1.8368
Minimum	.	.
Maximum	5.06	13.5
Data Count	60	60

note: Minimums = MDL=0

Solids, total suspended Location= G

	MO AVG lb/d	DAILY MX lb/d
Mean	45244.4778	83803.1302
Minimum	39406.	56068.
Maximum	58256.3	144622.6
Data Count	60	60

	MO AVG mg/L	WKLY AVG mg/L	DAILY MX mg/L
Mean	125.1203	141.9528	191.3228
Minimum	77.	99.	123.
Maximum	184.8	207.3	329.
Data Count	60	60	60

Zinc, total [as Zn] Location= G

	MO AVG ug/L	DAILY MX ug/L
Mean	91.2785	135.3472
Minimum	57.7	79.
Maximum	164.	570.
Data Count	60	60

BOD, 5-day, percent removal Location

	MO AV MN %
Mean	93.0133
Minimum	83.
Maximum	98.8
Data Count	60

Solids, suspended percent removal Lo

	MO AV MN %
Mean	92.1017
Minimum	84.
Maximum	98.2
Data Count	60

001T

LC50 Statre 48Hr Acute Mysid. Bahia

	MINIMUM %
Mean	95.

Minimum .
 Maximum 100.
 Data Count 20

Noel Static 1Hr Fert. Chronic Arbacia I

MINIMUM %
 Mean 86.275
 Minimum 12.5
 Maximum 100.
 Data Count 20

002A

BOD, 5-day, 20 deg. C Location= 1

	MO AVG mg/L	DAILY MX mg/L
Mean	32.6137	52.0447
Minimum	12.84	12.84
Maximum	63.32	293.5
Data Count	19	19

Chlorine, total residual Location= 1

	MO AVG ug/L	WKLY AVG ug/L	DAILY MX ug/L
Mean	2070.1138	1863.2157	2393.421
Minimum	3.	1.62	3.37
Maximum	5570.	5570.	5850.
Data Count	21	21	21

Coliform, fecal general Location= 1

	MO GEO MPN/100mL	DAILY MX MPN/100mL
Mean	29.9647	1412544.
Minimum	2.	2.
Maximum	274.	24000000.
Data Count	17	17

Flow, in conduit or thru treatment plant

	30DA AVG MGD	DAILY MX MGD
Mean	10.9943	18.0733
Minimum	2.1	2.1
Maximum	32.79	72.95
Data Count	21	21

pH Location= 1

	MINIMUM SU	MAXIMUM SU
Mean	6.7819	7.0362
Minimum	6.2	6.26
Maximum	7.3	8.11
Data Count	21	21

Solids, total suspended Location= 1

	MO AVG mg/L	DAILY MX mg/L
Mean	57.9674	69.5642
Minimum	29.	35.05
Maximum	102.	150.67
Data Count	19	19

BOD, 5-day, percent removal Location

	MINIMUM %
Mean	64.9333
Minimum	8.
Maximum	96.4
Data Count	15

Solids, suspended percent removal Lo

	MINIMUM %
Mean	56.58
Minimum	12.
Maximum	88.7
Data Count	15

ATTACHMENT A-9

**Comparison of Allowable Limits with Discharge Monitoring Report Data
and State User Fee Data**

Facility Name: Field's Point WWTF
RIPDES Permit #: RI0100315
Outfall #: 001A

NOTE: METALS LIMITS ARE TOTAL METALS

Parameter	CAS #	Concentration Limits (ug/L)		Antideg. Limits (ug/L) Monthly Ave	Ave UFP Data (ug/L) 7/07 - 11/11		Ave. DMR Data (ug/L) 7/09-6/14		Potential Permit Limits (ug/L)		Reasonable Potential?
		Daily Max	Monthly Ave		Max	Ave	Daily Max	Monthly Ave	Daily Max	Monthly Ave	
PRIORITY POLLUTANTS											
TOXIC METALS AND CYANIDE											
ANTIMONY	7440360	No Criteria	10240.00		2	2				10240	N
ARSENIC (limits are total recoverable)	7440382	306.34	5.44		2	1.4			306.34	5.44	Y
ASBESTOS	1332214	No Criteria	No Criteria								NA
BERYLLIUM	7440417	No Criteria	No Criteria								NA
CADMIUM (limits are total recoverable)	7440439	192.36	168.70						192.3636364	168.7005348	N
CHROMIUM III (limits are total recoverable)	16065831	No Criteria	No Criteria								NA
CHROMIUM VI (limits are total recoverable)	18540299	4983.80	901.14		18	3.6			4983.79859	901.1399799	N
COPPER (limits are total recoverable)	7440508	24.52	24.52	24.52	24	11.9	9.21	6.31	24.52322738	24.52	Y
CYANIDE	57125	4.00	4.00		50	25.1	4.1858	1.5328			Y
LEAD (limits are total recoverable)	7439921	4353.38	664.97		3	1.8			4353.382488	664.9723502	N
MERCURY (limits are total recoverable)	7439976	9.53	2.69	0.4			0.0076	0.0043	9.526418824	0.4	N
NICKEL (limits are total recoverable)	7440020	331.10	138.58	127	162	32.7	24.55	16.33	331.1	127	Y
SELENIUM (limits are total recoverable)	7782492	1307.33	1279.23		7	3.7			1307.334669	1279.228457	N
SILVER (limits are total recoverable)	7440224	20.14	No Criteria				0.25	0.12	20.13809524		N
THALLIUM	7440280	No Criteria	7.52							7.52	N
ZINC (limits are total recoverable)	7440666	422.49	422.49	380	42	29.4	31.03	23.84	422.4947146	380	N
VOLATILE ORGANIC COMPOUNDS											
ACROLEIN	107028	No Criteria	4640.00							4640	N
ACRYLONITRILE	107131	No Criteria	40.00							40	N
BENZENE	71432	No Criteria	8160.00							8160	N
BROMOFORM	75252	No Criteria	22400.00							22400	N
CARBON TETRACHLORIDE	56235	No Criteria	256.00							256	N
CHLOROBENZENE	108907	No Criteria	25600.00							25600	N
CHLORODIBROMOMETHANE	124481	No Criteria	2080.00							2080	N
CHLOROFORM	67663	No Criteria	75200.00		2.9	2.2				75200	N
DICHLOROBROMOMETHANE	75274	No Criteria	2720.00		1.7	1.6				2720	N
1,2DICHLOROETHANE	107062	No Criteria	5920.00							5920	N
1,1DICHLOROETHYLENE	75354	No Criteria	113600.00							113600	N
1,2DICHLOROPROPANE	78875	No Criteria	2400.00							2400	N
1,3DICHLOROPROPYLENE	542756	No Criteria	336.00							336	N
ETHYLBENZENE	100414	No Criteria	33600.00							33600	N
BROMOMETHANE (methyl bromide)	74839	No Criteria	24000.00							24000	N
CHLOROMETHANE (methyl chloride)	74873	No Criteria	No Criteria								NA

Chemical Name	Field ID	Criteria	RIPDESSum	Field Value	Field Value	Field Value	Field Value
METHYLENE CHLORIDE	75092	No Criteria	94400.00				94400 N
1,1,2,2-TETRACHLOROETHANE	79345	No Criteria	640.00				640 N
TETRACHLOROETHYLENE	127184	No Criteria	528.00	1.3			528 N
TOLUENE	108883	No Criteria	240000.00	1.3			240000 N
1,2-TRANS-DICHLOROETHYLENE	156605	No Criteria	160000.00				160000 N
1,1,1-TRICHLOROETHANE	71556	No Criteria	No Criteria				N
1,1,2-TRICHLOROETHANE	79005	No Criteria	2560.00				2560 N
TRICHLOROETHYLENE	79016	No Criteria	4800.00				4800 N
VINYL CHLORIDE	75014	No Criteria	38.40				38.4 N
ACID ORGANIC COMPOUNDS							
2-CHLOROPHENOL	95578	No Criteria	2400.00				2400 N
2,4-DICHLOROPHENOL	120832	No Criteria	4640.00				4640 N
2,4-DIMETHYLPHENOL	105679	No Criteria	13600.00				13600 N
4,6-DINITRO-2-METHYL PHENOL	534521	No Criteria	4480.00				4480 N
2,4-DINITROPHENOL	51285	No Criteria	84800.00				84800 N
4-NITROPHENOL	88755	No Criteria	No Criteria				NA
PENTACHLOROPHENOL	87865	52.00	52.00				52 N
PHENOL	108952	No Criteria	2720000.00				2720000 N
2,4,6-TRICHLOROPHENOL	88062	No Criteria	384.00				384 N
BASE NEUTRAL COMPOUNDS							
ACENAPHTHENE	83329	No Criteria	15840.00				15840 N
ANTHRACENE	120127	No Criteria	640000.00				640000 N
BENZIDINE	92875	No Criteria	0.03				0.032 N
POLYCYCLIC AROMATIC HYDROCARBONS		No Criteria	2.88				2.88 N
BIS(2-CHLOROETHYL)ETHER	111444	No Criteria	84.80				84.8 N
BIS(2-CHLOROISOPROPYL)ETHER	108601	No Criteria	1040000.00				1040000 N
BIS(2-ETHYLHEXYL)PHTHALATE	117817	No Criteria	352.00				352 N
BUTYL BENZYL PHTHALATE	85687	No Criteria	30400.00				30400 N
2-CHLORONAPHTHALENE	91587	No Criteria	25600.00				25600 N
1,2-DICHLOROBENZENE	95501	No Criteria	20800.00				20800 N
1,3-DICHLOROBENZENE	541731	No Criteria	15360.00				15360 N
1,4-DICHLOROBENZENE	106467	No Criteria	3040.00				3040 N
3,3-DICHLOROBENZIDENE	91941	No Criteria	4.48				4.48 N
DIETHYL PHTHALATE	84662	No Criteria	704000.00	11.5	11.5		704000 N
DIMETHYL PHTHALATE	131113	No Criteria	17600000.00				17600000 N
Di-n-BUTYL PHTHALATE	84742	No Criteria	72000.00				72000 N
2,4-DINITROTOLUENE	121142	No Criteria	544.00				544 N
1,2-DIPHENYLHYDRAZINE	122667	No Criteria	32.00				32 N
FLUORANTHENE	206440	No Criteria	2240.00				2240 N
FLUORENE	86737	No Criteria	84800.00				84800 N
HEXACHLOROBENZENE	118741	No Criteria	0.05				0.0464 N
HEXACHLOROBUTADIENE	87683	No Criteria	2880.00				2880 N
HEXACHLOROCYCLOPENTADIENE	77474	No Criteria	17600.00				17600 N

