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 City of Cranston

is authorized to discharge from a facility located at

Cranston Water Pollution Control Facility
140 Pettaconsett Avenue
Cranston, Rhode Island

to receiving waters named

Pawtuxet River

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

This permit shall become effective on January 1, 2020.

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

This permit supersedes the permit issued on September 30, 2008.

This permit consists of 26 pages in Part I including effluent limitations, monitoring requirements, etc. and 10 pages in Part II including General Conditions.

Signed this 30th day of September, 2019.

Angelo S. Liberti

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

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number(s) 001A. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs./day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Flow	20.2 MGD	--- MGD				Continuous	Recorder
$CBOD_5$							
(Nov 1-May 31)	4,212 lb/day	7,581 lb/day	25 mg/l	40 mg/l	45 mg/l	1/Day	24-Hr. Comp.
(June 1-June 30 & Oct. 1-Oct. 31)	2,527 lb/day	3,369 lb/day	15 mg/l	15 mg/l	20 mg/l	1/Day	24-Hr. Comp.
(July 1 – Sept. 30)	1,685 lb/day	2,527 lb/day	10 mg/l	10 mg/l	15 mg/l	1/Day	24-Hr. Comp.
$CBOD_5$ - % Removal (June 1 – Oct 31)			85%			1/Month	Calculated
TSS (Nov 1-May 31)	5,054 lb/day	8,423 lb/day	30 mg/l	45 mg/l	50 mg/l	1/Day	24-Hr. Comp.
(June 1-June 30 & Oct. 1-Oct. 31)	4,212 lb/day	5,054 lb/day	25 mg/l	25 mg/l	30 mg/l	1/Day	24-Hr. Comp.
(July 1 – Sept. 30)	3,369 lb/day	5,054 lb/day	20 mg/l	20 mg/l	30 mg/l	1/Day	24-Hr. Comp.
TSS - % Removal			85%			1/Month	Calculated
Settleable Solids				--- ml/l	--- ml/l	1/Day	Grab

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

Influent sampling for TSS and $CBOD_5$ shall be conducted three (3) times/week and coordinated with effluent sampling to provide appropriate allowances for hydraulic detention (flow-through) time.

Sampling for TSS and $CBOD_5$ shall be performed five (5) times/week, Sunday – Saturday. One (1) of the TSS samples shall be collected on either Saturday or Sunday. Sampling for Flow and Settleable Solids shall be performed Sunday-Saturday.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 001A.

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(s) 001A. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs./day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Enterococci			54 cfu[1] / 100 ml		175 cfu[1] / 100 ml	3/Week	Grab
Fecal Coliform			--- MPN[1] / 100 ml	--- MPN[1] / 100 ml	--- MPN[1] / 100 ml	3/Week	Grab
Total Residual Chlorine (TRC)			22.5 ug/l		38.9 ug/l	3/Day[2]	Grab[2]
pH			(6.0 SU)		(9.0 SU)	2/Day	Grab
Dissolved Oxygen (June 1 – Oct. 31)			(6.0 mg/l)			Continuous	Recorder

[1]Two (2) of the three (3) Enterococci and Fecal coliform samples are to be taken Tuesday and Thursday. The Fecal Coliform samples shall be taken at the same time as the Enterococci samples. The Geometric Mean shall be used to obtain the "weekly average" and "monthly average." The facility shall report any fecal coliform sample result that exceeds 400 MPN/100 mL to the RI DEM in accordance with the 24-hour reporting requirements under Part II(I)(5) of the permit.

[2]The use of a continuous TRC recorder after chlorination and prior to dechlorination is required to provide a record that proper disinfection was achieved at all times. Compliance with these limitations shall be determined by taking a minimum of three (3) grab samples over an eight (8) hour shift, with the first sample taken between 8:00 A.M. and 10:00 A.M., Monday - Friday (except holidays), and all subsequent samples equally spaced over the remainder of the shift. On Saturdays, Sundays, and Holidays at least two (2) grab samples are to be taken with a minimum of two (2) 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/Maximum for the reporting period rather than Average Monthly/Maximum Daily.

Sampling for Fecal Coliform shall be conducted three (3) times/week, Sunday – Saturday. Sampling for pH shall be conducted Sunday-Saturday.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 001A.

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(s) 001A. Such discharges shall be monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs. per day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Phosphorus, Total							
(Nov. 1 –March 31)			1.0 mg/l		--- mg/l	1/Week	24-Hr. Comp.
(April 1 – Oct 31)			0.1 mg/l		--- mg/l	1/Week	24-Hr. Comp.
Orthophosphorus							
(Nov. 1 – March 31)			--- mg/l		--- mg/l	1/Week	24-Hr. Comp.
Ammonia, Total (as N)							
(Nov. 1 – April 30)			16.2 mg/l	--- mg/l	72.4 mg/l	1/Week	24-Hr. Comp.
(May 1 – May 31)			6.2 mg/l	--- mg/l	73.2 mg/l	1/Week	24-Hr. Comp.
(June 1 – Oct. 31)			2.0 mg/l	2.0 mg/l	3.0 mg/l	1/Week	24-Hr. Comp.
Nitrogen, Total (TKN + Nitrate + Nitrite, as N)							
(Nov. 1 – April 30)[1]	--- lb/d		--- mg/l		--- mg/l	2/Month	Calculated
(May 1 – Oct. 31)	1348 lb/d		8.0 mg/l		--- mg/l	1/Week	Calculated

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

[1]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 methanol addition.

Samples taken in compliance with the monitoring requirements specified above shall be taken Monday through Friday at the following locations: Outfall 001A.

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(s) 001A. Such discharges shall be monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs. per day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
TKN							
(Nov. 1 – April 30)			--- mg/l		--- mg/l	2/Month	24-Hr. Comp.
(May 1 – Oct. 31)			--- mg/l		--- mg/l	1/Week	24-Hr. Comp.
Nitrate, Total (as N)							
(Nov. 1 – April 30)			--- mg/l		--- mg/l	2/Month	24-Hr. Comp.
(May 1 – Oct. 31)			--- mg/l		--- mg/l	1/Week	24-Hr. Comp.
Nitrite, Total (as N)							
(Nov. 1 – April 30)			--- mg/l		--- mg/l	2/Month	24-Hr. Comp.
(May 1 – Oct. 31)			--- mg/l		--- mg/l	1/Week	24-Hr. Comp.

--- 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 location: Outfall 001A.

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

5. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number(s) 001A. Such discharges shall be monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs. per day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Lead, Total			0.34 µg/l[1]		8.7 µg/l	1/Week	24-Hr. Comp.
Arsenic, Total			4.6 ug/l		558 ug/l	1/Week	24-Hr. Comp.
Cyanide			8.5 µg/l[1]		36.1 µg/l	1/Week	Composite[2]
Selenium, Total			8.2 ug/l		32.8 ug/l	1/Week	24-Hr. Comp.
Iron, Total			1,733 ug/l		--- ug/l	See Footnote 3	24-Hr. Comp.
Aluminum, Total			143 ug/l		1233 ug/l	See Footnote 3	24-Hr. Comp.
Cadmium, Total			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.
Copper, Total			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.
Hexavalent Chromium			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.
Nickel, Total			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.
Zinc, Total			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.

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

[1] The limit at which compliance/noncompliance determinations will be based is the quantitation limit which is defined as 10.0 µg/l for available cyanide and 3.0 µg/l for lead. These values may be reduced by permit modification as EPA and the State approve more sensitive methods.

[2] Compliance with these limitations shall be determined by taking three grab samples per day, equally spaced over one (1) day with a minimum of three hours between grabs, and preserved immediately upon collection. All three (3) samples shall be composited, then analyzed for available cyanide.

[3] Weekly sampling for Total Iron and/or Total Aluminum is only in effect during months in which Iron based and/or Aluminum based chemicals are used in the treatment process. For all other periods sampling is only required for Total Aluminum on a quarterly basis in accordance with Part I.B of this permit.

Samples taken in compliance with the monitoring requirements specified above shall be taken Monday through Friday at the following locations: Outfall 001A.

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) 001A. Such discharges shall be monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs. per day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Ceriodaphnia sp.							
LC50[1]					100% or Greater[2]	1/Quarter	24-Hr. Comp.
C-NOEC[3]					50% or Greater[4]	1/Quarter	24-Hr. Comp.
Pimephales promelas							
LC50[1]					100% or Greater[2]	1/Quarter	24-Hr. Comp.

[1]LC_{50} is defined as the concentration of wastewater that causes mortality to 50% of the test organisms.

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

[3]Chronic – No Observed Effects Concentration (C-NOEC) is the concentration of toxicant or effluent to which organisms are exposed in a life-cycle or partial life-cycle which causes no adverse effect on growth, survival or reproduction (see Section I.B.).

[4]The limit of 50% or greater is defined as a sample which is composed of 50% effluent.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: at Outfall 001A (final treated discharge after disinfection) in accordance with Part I.B. of the permit.

7. 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 biochemical oxygen demand. 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. In accordance with Order of Approval No. 1634 issued by the DEM on July 25, 2013, construction of the Phase II BNR design upgrade must be initiated when the 120-day average influent $CBOD_5$ and/or Total Kjeldahl Nitrogen loads exceed 32,300 lbs/day and 5,900 lbs/day, respectively. The permittee must advertise for bids for the Phase II BNR design upgrade project within three (3) months of exceeding the 120-day average influent $CBOD_5$ and/or Total Kjeldahl Nitrogen trigger loads and construction must be completed within eighteen (18) months of exceeding these trigger loads.

g. The permittee shall analyze its effluent annually for the EPA Priority Pollutants as listed in 40 CFR 122, Appendix D, Tables II and III. Such analysis shall be conducted during the third calendar quarter bioassay sampling event. The effluent sample shall be collected during the same twenty-four (24) hour period as the bioassay sample. The results of these analyses shall be submitted to the Department of Environmental Management by October 15th of each year. 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.

h. 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 eight (8) toxicity tests per year on samples collected from discharge Outfall 001A. 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. Chronic and acute toxicity data shall be reported as outlined in Section B.9. The acute fish and chronic daphnid tests shall be used to calculate the acute LC_{50} at the forty-eight (48) hour exposure interval. Test results will be interpreted by the State. The State may require additional screening, range finding, 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

For four (4) sampling events, (one each calendar quarter) the permittee will conduct a forty-eight (48) hour acute definitive toxicity test on one (1) species and a seven day chronic toxicity tests on one (1) species listed below, for a total of four (4) acute and four (4) chronic toxicity tests per year. This requirement entails performing two-species testing as follows:

Species	Test Type Two Species Test (Four Times Annually)	Frequency
Daphnid (Ceriodaphnia sp.)	Reproduction/Survival Acute Static (LC_{50})	Quarterly
Fathead Minnow (Pimephales promelas)	Survival Acute Static (LC_{50})	Quarterly

A sampling event is defined as three (3) 24-hour composites collected over the seven-day test period (see Section B.4).

3. Testing Methods

Toxicity testing 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 effluent sample shall be collected at a location just prior to the outfall during a dry weather period (no rain 48 hours prior to or during sampling unless approved by DEM). For each sampling event, the effluent samples shall be collected on days 0, 3, and 5 of the 7-day exposure period. The first sample is used for test initiation, Day 1, and for test solution renewal on Day 2. The second sample would be used for test solution renewal on Days 3 and 4. The third sample would be used for test solution renewal on Days 5, 6, and 7.

To eliminate the problem of potential rainfall interference during the five-day sampling period for the chronic tests, DEM suggests collecting enough sample on Day 0 to properly store and use one-third on both Days 3 and 5 if rain has occurred since Day 0. In addition, if no rainfall has occurred since Day 3, enough sample should also be collected on Day 3 to use for Day 5 if necessary. In the laboratory, the initial sample (Day 0) will be split into two (2) subsamples, after thorough mixing, for the following:

A: Chemical Analysis
B: Chronic Toxicity Testing

Day 3 and 5 samples will be held until test completion. If either the Day 3 or 5 renewal sample is of sufficient potency to cause lethality to 50% or more test organisms in any of the dilutions for either species, then a chemical analysis shall be performed on the appropriate samples as well.

All samples held overnight shall be refrigerated at 4°C.

5. Dilution Water

Dilution water used for freshwater chronic toxicity analyses should be of sufficient quality to meet minimum acceptability of test results (see Sections B.6 and B.7). The Cranston WWTF is authorized to use laboratory water of known quality with a hardness and pH similar to that of the receiving water as an alternate dilution water source for the Fathead Minnow test. The DEM reserves the right to revoke this authorization at any time and may immediately require the permittee to use Pawtucket Reservoir water as a diluent as DEM deems necessary. If such a determination is made it will be provided in writing to the permittee. For the Daphnid, natural freshwater shall be used as the dilution water. This water shall be collected from Pawtucket Reservoir. If this natural freshwater diluent is found to be, or suspected to be toxic or unreliable, an alternate or laboratory source of water of known quality with a hardness and pH similar to that of the receiving water may be substituted AFTER RECEIVING WRITTEN APPROVAL FROM DEM.

6. Effluent Toxicity Test Conditions for the Daphnid (Ceriodaphnia dubia sp.) Survival and Reproduction Test

a.	Test Type	Static Renewal
b.	Temperature (C)	$25^{\circ} \pm 1^{\circ}$ C (temperature must not deviate by more than 3° C during test)
c.	Light Quality	Ambient laboratory illumination
d.	Photoperiod	16 hours light, 8 hours dark
e.	Test Chamber Size	30 ml
f.	Test Solution Volume	15 ml
g.	Renewal of Test Solutions	Daily, using most recently collected sample.
h.	Age of Test Organisms	Less than twenty-four (24) hours and all released within an eight (8) hour period of each other
i.	Number of Neonates Per Test Chamber	1
j.	Number of Replicate Test Chambers Per Treatment	10
k.	Number of Neonates Per Test Concentration	10
l.	Feeding Regime	Feed 0.1 ml each of YTC and algal suspension per exposure chamber daily
m.	Aeration	None
n.	Dilution Water	Pawtucket Reservoir, see Section B.5.
o.	Effluent Concentrations	Five (5) dilutions plus a control: 100%, 50%, 25%, 12.5%, 6.25% and 0% effluent
p.	Test Duration	Until 60% of control females have three (3) broods (may require seven (7) days max 8 days)
q.	End Points	Survival and reproduction

r.	Test Acceptability	80% or greater survival of control organisms and an average of fifteen (15) or more neonates per female in the control solutions. At least 60% of surviving females in control should have produced three broods
s.	Sampling Requirements	For off-site tests, a minimum of three (3) samples are collected (i.e., Days 0, 3 & 5) and used for renewal (see Section B.4). Off-site test samples must be first used within thirty-six (36) hrs after the last sample of composite is collected
t.	Sample Volume Required	Minimum 2 liters/day

7. Effluent Toxicity Conditions for the Fathead Minnow (Pimephales promelas) Mortality Test

a.	Test Type	48-hour Static Acute Definitive
b.	Temperature	25° ± 1° C (temperature must not deviate by more than 3° C during test)
c.	Light Quality	Ambient laboratory illumination
d.	Photoperiod	16 hours light, 8 hours dark
e.	Test Chamber Size	250-1000 ml
f.	Test Solution Volume	Minimum 200 ml/replicate
g.	Renewal of Test Solution	After 48 hrs
h.	Age of Test Organisms	1 - 14 Days; less than 24h range in age
i.	No. Organisms Per Test Chamber	10
j.	No. of Replicate Test Chambers Per Concentration	2
k.	Total No. of Organisms Per Test Concentration	20

l.	Feeding Regime	Feed Artemia nauplii prior to the test; add 0.2 mL Artemia nauplii concentrate 2h prior to test solution renewal at 48h
m.	Aeration	None, unless DO concentration falls below 4.0 mg/L at which aeration rate should not exceed 100 bubbles/min
n.	Dilution Water	laboratory water of known quality with a hardness and pH similar to that of the receiving water. see Section B.5
o.	Number of Dilutions	Five dilutions plus a control: 100%, 50%, 25%, 12.5%, 6.25% and 0% effluent
p.	Effect Measured and Test Duration	Mortality - no movement, 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 36 hours after the last sample of the composite is collected
s.	Sample Volume Required	Minimum 2 liters

8. Chemical Analysis

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

Parameter	Effluent	Diluent	Detection Limit (mg/l)
Hardness	X	X	0.5
Alkalinity	X	X	2.0
pH	X	X	---
Specific Conductance	X	X	---
Total Solids and Suspended Solids	X	X	---
Total Ammonia	X	X	0.1
Total Organic Carbon	X		0.5
Cyanide	X		0.010

During each calendar quarter bioassay sampling event the following chemical analyses shall be performed:

Total Metals	Effluent	Diluent	Minimum Detection Limit (ug/l)
Total Aluminum	X	X	5.0
Total Cadmium	X	X	0.1
Total Copper	X	X	1.0
Hexavalent Chromium	X	X	20.0
Total Lead	X	X	1.0
Total Nickel	X	X	1.0
Total Zinc	X	X	5.0

The above metal analyses may be used to fulfill, in part or in whole, monthly 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.

In addition, the following chemical analyses shall be performed as part of each daily renewal procedure on each dilution and the controls.

Parameter	Beginning of 24-Hour Exposure Period	End of 24-Hour Exposure Period
Dissolved Oxygen	X	X
Temperature	X	
pH	X	
Specific Conductance	X	
Alkalinity	X[1]	
Hardness	X[1]	

[1]These are performed on the 100% effluent and control samples only.

9. 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.
- Raw data and laboratory sheets.
- Any other observations or test conditions affecting test outcome.
- Results of required chemical and physical analyses.

Toxicity test data shall include the following:

Chronic

- Daily survival of test organisms in the controls and all replicates in each dilution. Survival data should be analyzed by Fisher's Exact Test prior to analysis of reproduction data.
- Young per female for all replicates in each dilution for Ceriodaphnia and weight for minnow larvae.
- Dissolved oxygen, pH, specific conductance, and temperature for each dilution.

- Results of Dunnett's Procedure and/or other EPA recommended or approved methods for analyzing the data.

- C-NOEC = Chronic No Observed Effect Concentration

- LOEC = Lowest Observed Effect Concentration

- MATC = Maximum Allowable Toxicant Concentration

Acute - (These data points are to be obtained 48 hours into the chronic test).

- Survival for each concentration and replication at time 24 and 48 hours.

- Dissolved oxygen, pH and specific conductance for each concentration.

- LC_{50} and 95% confidence limits using one of the following methods in order of preference: Probit, Trimmed Spearman Karber, Moving Average Angle, or the graphical method; printout or copy of these calculations. 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 (% 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), a LC_{50} may be estimated using the graphical method.

10. Reporting of Bioassay Testing

Bioassay Testing shall be conducted as follows:

Quarter Testing to be Performed	Results Submitted on DMR for
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 DEM.

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 Ordinance, 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 effect disposal options, or adversely effect worker safety and health.

a. The permittee has an approved Local Limits Monitoring Plan (LLMP) that shall continue to be implemented at all times.

b. At the time of renewal of this permit and in accordance with 40 CFR 122.44(j)(2), 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 procedures required by Part I.C.3.a of this permit and current RIPDES permit discharge limits, sludge disposal criteria, secondary treatment inhibition, and worker health and safety criteria.

4. Enforcement Response Plan (ERP)

The permittee has an approved ERP dated March 12, 2008 that meets the requirements of 40 CFR 403.8(f)(5). The permittee shall continue to implement its approved ERP 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 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 superseding 40 CFR 403 streamlining provisions have been adopted, whether each SIU requires a Slug Control Plan. If a Slug Control Plan is required, it shall include the contents specified by 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 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 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 approval by DEM.

Within thirty (30) days of DEM's final approval of the proposed modification(s), the permittee shall implement the modification and submit proof that the local officials have endorse and/or approved the modification(s) to the DEM. Upon final approval by the DEM and adoption by the permittee, this modification(s) 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.

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)(viii), 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 40 CFR 403.3 and the permittee's sewer use ordinance.

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(1) 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 October 1st through September 30th and shall be submitted to the DEM by December 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, including dates, 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 of the Compliance status of each Industrial User (IU), as of the end of last quarter covered by the annual report. The list shall identify all IUs in non-compliance, the pretreatment program requirement which the IU failed to meet, and the type, and date of the enforcement action initiated by the permittee in response to the violation. If applicable, the list shall also contain the date which IUs in non-compliance returned to compliance, a description of corrective actions ordered, and the penalties 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 a copy of an affidavit of publication, from the newspaper, averring that the names of these violators has been published;

e. A summary 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 and dates of analysis

f. A summary of permit issuance/reissuance activities including the name of the industrial user, expiration date of previous permit, issuance date of new permit, and a brief description of any changes to the permit;

g. A list including the report/notification type, due date, and receipt date for each report/notification required by 40 CFR 403.12.

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 SUO, 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 Report Summary Sheet.

8. Interjurisdictional Agreement

Within sixty (60) days of the effective date of the permit, the permittee shall submit to the DEM, an attorney's statement which contains an evaluation, by the City Solicitor or a public official acting in a comparable capacity, of the interjurisdictional agreements between the City of Cranston and Broadrock/RILFG Genco, as well as any other interjurisdictional agreements as may be necessary with the Town of Johnston or individual industrial users located in Johnston. The attorney statement shall evaluate the adequacy of the agreements in terms of, but not limited to, legal authority provided for: the consistency of the Cranston Sewer Use Ordinance and adopted local limits with respect to Broadrock/RILFG Genco and any other interjurisdictional agreements; enforcement actions by Cranston for violations of the Cranston Pretreatment Program by Broadrock/RILFG Genco or any other interjurisdictional agreements; permitting, inspecting, and sampling of Industrial Users for all interjurisdictional agreement(s) in each contributing jurisdiction; Cranston's right to enter facilities located of Broadrock/RILFG Genco and any other interjurisdictional agreements; Cranston's authority to access all records compiled by each interjurisdictional agreement contributor in relation to pretreatment program activities; and remedies for breach of contract. In addition, the attorney statement must evaluate the present status of the implementation of the interjurisdictional agreement by Broadrock/RILFG Genco and any other interjurisdictional agreement contributor.

If any interjurisdictional agreement is determined deficient, the attorney statement shall contain a proposed interjurisdictional agreement which provides adequate legal authority. A proposed compliance schedule shall also be submitted for implementing any requirements of the interjurisdictional agreement which have yet to be fulfilled. Upon approval of the DEM, the proposed interjurisdictional agreement and compliance schedule shall be adopted within 180 days.

9. Sewer Use Ordinance

The permittee has an approved Sewer Use Ordinance which shall continue to be implemented at all times.

D. 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 two (2) years shall be submitted to DEM, Office of Water Resources, by the 15th day of January of every other year. The first report is due January 15, 2019.

3. Operation and Maintenance Plans

The permittee shall submit an addendum to their Operation and Maintenance plans to specifically address steps they have, and the steps they will take, to operate the treatment works as efficiently as possible and reduce effluent nitrogen concentrations as low as possible. The revised Operation and Maintenance plans are due ninety (90) days after the issuance of this permit.

4. Resiliency Planning

Within one year of the effective date of this permit, the permittee shall submit a Resiliency Plan and schedule of short and long term actions that will be taken to maintain operation and protect key collection and treatment system assets. The plan shall be consistent with the DEM's Guidance for the Consideration of Climate Change Impacts in the Planning and Design of Municipal Wastewater Collection and Treatment Infrastructure and include consideration of the findings of the 2017 DEM report Implications of Climate Change for Rhode Island Wastewater Collection and Treatment Infrastructure. The Resiliency Plan shall include, but not be limited to: (i) an assessment of current and projected impacts from natural hazards on critical components within the collection and treatment systems, as well as on the systems themselves; (ii) a plan to adapt and protect vulnerable components and systems; (iii) an analysis that provides justification for selected adaptation methods. The analysis must consider component and system design life and sea-level rise projections. For the purposes of this Resiliency Plan, critical components are considered those necessary to ensure the forward flow and treatment of wastewater in accordance with the limits set forth in this permit. The Resiliency Plan shall also consider impacts on the WWTF from neighboring facilities during high hazard events. This Plan shall be subject to DEM review and approval. If DEM determines that modifications need to be made to the Plan, DEM shall notify the permittee in writing which elements of the Plan need to be modified and the reason for the needed modification. This notification shall include a schedule for making the changes. After such notification from the DEM, the permittee shall make changes to the Plan and submit the revisions to the DEM for their approval.

E. 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 Sewage Sludge Management. The permittee shall comply with its DEM Order of Approval for the disposal of sludge.

F. 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. 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 documented and maintained onsite.

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 maintained onsite. 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)
1V	acrolein	10.0
2V	acrylonitrile	5.0
3V	benzene	1.0
5V	bromoform	1.0
6V	carbon tetrachloride	1.0
7V	chlorobenzene	1.0
8V	chlorodibromomethane	1.0
9V	chloroethane	1.0
10V	2-chloroethylvinyl ether	5.0
11V	chloroform	1.0
12V	dichlorobromomethane	1.0
14V	1,1-dichloroethane	1.0
15V	1,2-dichloroethane	1.0
16V	1,1-dichloroethylene	1.0
17V	1,2-dichloropropane	1.0
18V	1,3-dichloropropylene	1.0
19V	ethylbenzene	1.0
20V	methyl bromide	1.0
21V	methyl chloride	1.0
22V	methylene chloride	1.0
23V	1,1,2,2-tetrachloroethane	1.0
24V	tetrachloroethylene	1.0
25V	toluene	1.0
26V	1,2-trans-dichloroethylene	1.0
27V	1,1,1-trichloroethane	1.0
28V	1,1,2-trichloroethane	1.0
29V	trichloroethylene	1.0
31V	vinyl chloride	1.0

Acid Compounds - EPA Method 625		MDL ug/l (ppb)
1A	2-chlorophenol	1.0
2A	2,4-dichlorophenol	1.0
3A	2,4-dimethylphenol	1.0
4A	4,6-dinitro-o-cresol	1.0
5A	2,4-dinitrophenol	2.0
6A	2-nitrophenol	1.0
7A	4-nitrophenol	1.0
8A	p-chloro-m-cresol	2.0
9A	pentachlorophenol	1.0
10A	phenol	1.0
11A	2,4,6-trichlorophenol	1.0

Pesticides - EPA Method 608		MDL ug/l (ppb)
1P	aldrin	0.059
2P	alpha-BHC	0.058
3P	beta-BHC	0.043
4P	gamma-BHC	0.048
5P	delta-BHC	0.034
6P	chlordane	0.211
7P	4,4 ' -DDT	0.251
8P	4,4 ' -DDE	0.049
9P	4,4 ' -DDD	0.139
10P	dieldrin	0.082
11P	alpha-endosulfan	0.031
12P	beta-endosulfan	0.036
13P	endosulfan sulfate	0.109
14P	endrin	0.050
15P	endrin aldehyde	0.062
16P	heptachlor	0.029
17P	heptachlor epoxide	0.040

Pesticides - EPA Method 608		MDL ug/l (ppb)
18P	PCB-1242	0.289
19P	PCB-1254	0.298
20P	PCB-1221	0.723
21P	PCB-1232	0.387
22P	PCB-1248	0.283
23P	PCB-1260	0.222
24P	PCB-1016	0.494
25P	toxaphene	1.670

Base/Neutral - EPA Method 625		MDL ug/l (ppb)
1B	acenaphthene *	1.0
2B	acenaphthylene *	1.0
3B	anthracene *	1.0
4B	benzidine	4.0
5B	benzo(a)anthracene *	2.0
6B	benzo(a)pyrene *	2.0
7B	3,4-benzofluoranthene *	1.0
8B	benzo(ghi)perylene *	2.0
9B	benzo(k)fluoranthene *	2.0
10B	bis(2-chloroethoxy)methane	2.0
11B	bis(2-chloroethyl)ether	1.0
12B	bis(2-chloroisopropyl)ether	1.0
13B	bis(2-ethylhexyl)phthalate	1.0
14B	4-bromophenyl phenyl ether	1.0
15B	butylbenzyl phthalate	1.0
16B	2-chloronaphthalene	1.0
17B	4-chlorophenyl phenyl ether	1.0
18B	chrysene *	1.0
19B	dibenzo (a,h)anthracene *	2.0
20B	1,2-dichlorobenzene	1.0
21B	1,3-dichlorobenzene	1.0
22B	1,4-dichlorobenzene	1.0
23B	3,3 ' -dichlorobenzidine	2.0
24B	diethyl phthalate	1.0
25B	dimethyl phthalate	1.0
26B	di-n-butyl phthalate	1.0
27B	2,4-dinitrotoluene	2.0
28B	2,6-dinitrotoluene	2.0
29B	di-n-octyl phthalate	1.0
30B	1,2-diphenylhydrazine (as azobenzene)	1.0
31B	fluoranthene *	1.0
32B	fluorene *	1.0
33B	hexachlorobenzene	1.0
34B	hexachlorobutadiene	1.0
35B	hexachlorocyclopentadiene	2.0
36B	hexachloroethane	1.0
37B	indeno(1,2,3-cd)pyrene *	2.0
38B	isophorone	1.0
39B	naphthalene *	1.0
40B	nitrobenzene	1.0
41B	N-nitrosodimethylamine	1.0
42B	N-nitrosodi-n-propylamine	1.0
43B	N-nitrosodiphenylamine	1.0
44B	phenanthrene *	1.0
45B	pyrene *	1.0
46B	1,2,4-trichlorobenzene	1.0

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, Available	10.0
Phenols, Total	50.0
Aluminum, Total	5.0
TCDD	**
MTBE (Methyl Tert Butyl Ether)	1.0

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

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).

G. 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. Submittal of DMRs Using NetDMR

a. 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
- Monthly Operating Reports

c. 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 when submitted to DEM.

- Written notifications required under Part II
- Notice of unauthorized discharges, including Sanitary Sewer Overflow (SSO) reporting
- Priority Pollutant Scan results for Outfall 001A
- Infiltration/Inflow Reports
- Pretreatment 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

d. 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(I)(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.

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. RI0100013

NAME AND ADDRESS OF APPLICANT:

The City of Cranston
869 Park Avenue
Cranston, RI 02910

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Cranston Water Pollution Control Facility
140 Pettaconsett Avenue
Cranston, RI

RECEIVING WATER: **Pawtuxet River (Water Body ID # RI0006017R-03)**

CLASSIFICATION: **B1**

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 treatment of industrial and municipal wastewater.

II. Description of Discharge

A quantitative description of the discharge in terms of significant effluent parameters based on DMR data from December 2008 through April 2016 is shown in Attachment 1.

III. Permit Limitations and Conditions

The final effluent limitations and monitoring requirements may be found in the draft permit.

IV. Permit Basis and Explanation of Effluent Limitation Derivation

The City of Cranston owns the Wastewater Treatment Facility located on Pettaconsett Avenue in Cranston, Rhode Island and has a contract with Veolia Water North America to operate the Wastewater Treatment Facility. The discharge to the Pawtuxet River consists of treated sanitary

sewage contributed by the municipalities of Johnston and Cranston. As of September 2016, the end of Cranston's most recent Industrial Pretreatment Program reporting year, there were thirty (30) Significant Industrial Users (SIUs) and approximately four hundred and fifty (450) other (i.e., non-SIU) permitted industrial users contributing wastewater to the Cranston WWTF. Treatment consists of: Influent screening, grit removal, primary clarification, fine bubble aeration activated sludge and biological nutrient removal, secondary clarification and chlorination/dechlorination. A diagram of the facility is included in Attachment A-2.

On September 30, 2008 the current RIPDES Permit was issued for the facility. On October 26, 2009 Consent Agreement No. RIA-404 was executed between the Rhode Island Department of Environmental Management and the City of Cranston to resolve the City of Cranston's appeal of conditions included in its RIPDES Permit No. RI0100013. In particular the City of Cranston was provided with additional time to comply with the final limits established for Total Nitrogen, Total Phosphorus, Available Cyanide, Total Arsenic, and Total Cadmium. In accordance with RIA-404 the City is currently in the process of completing construction of its Biological Nutrient Removal (BNR) Upgrade. The City's approved Facilities Plan indicated that the BNR upgrades would enable the City to comply with its final permit limits for Total Nitrogen (TN), Total Phosphorus, and Total Arsenic. Based on the Facilities Plan Amendment dated February 23, 2012 the planned WWTF upgrade included the addition of the ballasted flocculation system to address Total Phosphorus and it will also provide the added benefit of reducing effluent Arsenic to below permitted levels. Ferric chloride will be used as the tertiary treatment ballasted flocculation coagulant for phosphorus removal. The Facilities Plan revision dated February 23, 2012 also indicated that the final permit limits for Cadmium and Cyanide were being met at the time of the Facilities Plan revision, as a result the planned upgrade was not required to address these two particular pollutants.

Receiving Water Description

The water body segment that receives the discharge from the Cranston WWTF is described as the Main Stem of the Pawtuxet River from the confluence of the North and South branches at Riverpoint to the Pawtuxet Cove Dam at Pawtuxet. The waterbody identification number for these waters is RI0006017R-03. This segment is located in West Warwick, Warwick, and Cranston and is classified as a class B1 water body according to the Rhode Island Water Quality Regulations. Class B1 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. However all Class B criteria must be met. Currently this segment is not supporting the Fish and Wildlife Habitat use due to impairments associated with Benthic-Macroinvertebrate Bioassessments, Cadmium, Non-Native Aquatic Plants, and Total Phosphorus. This segment is also not supporting the Fish Consumption use due to impairments associated with Mercury in fish tissue. Lastly this segment is not supporting the primary and secondary contact recreation use due to impairments associated with Enterococcus.

Permit 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 Federal Clean Water Act (CWA).

Water Quality Based Permit Limits

Development of RIPDES permit limitations is a multi-step process consisting of the following steps: calculating allowable water quality-based discharge levels based on instream criteria, background data and available dilution; identifying any technology-based limits that apply to the facility; assigning appropriate Best Professional Judgment (BPJ) limits; setting the most stringent of these limits as the final allowable discharge levels; comparing existing discharge concentrations to the new allowable discharge levels; and evaluating the ability of the facility to

meet the final permit effluent limits.

The DEM previously issued RIPDES permits for the wastewater treatment facilities (WWTFs) owned and operated by the Town of West Warwick and the Cities of Warwick and Cranston (the Communities). These permits included limitations necessary to allow the Pawtuxet River to meet the numeric water quality standards for certain metals and Dissolved Oxygen (DO), which were established using a wasteload allocation process after application of the computer models PAWTOXIC and Qual II. Details of the wasteload allocation (WLA) process may be found in the communities' previous permit development documents.

Flow Limitations

In November of 2011 the Town of West Warwick submitted a Facilities Plan Amendment which called for an increase in the design flow of the WWTF from 10.5 MGD (16.24 cfs) to 11.0 MGD (17.02 cfs). In March of 2014 the DEM granted an Order of Approval for the construction of plant phosphorus removal upgrades which were designed based on a future flow of 11.0 MGD. As a result the DEM modified the wastewater flow for West Warwick that was used in the above-mentioned models. Below is a Table summarizing the WWTF flows used in the 2017 WLA. These flows were also used as the monthly average permitted flow limits.

Table 1. WWTF Design Flows		
	Cubic Feet Per Second (cfs)	Million Gallons Per Day (MGD)
West Warwick	17.02	11.0
Warwick	11.91	7.7
Cranston	31.26	20.2
Former Clariant Corp.	1.62	1.05

Permit Limitations Based upon the Dissolved Oxygen Wasteload Allocation Modeling

In 1989, the SEMCOG version of Qual II was used to model the DO dynamics of the Pawtuxet River and develop discharge limits for Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), Ammonia, and DO. However, the SEMCOG version can't be run on a personal computer and, therefore, all the recent DO model runs were performed using the Qual 2E model. To determine if the proposed modifications in wastewater design flows necessitated a reduction in the permit limits, the instream concentrations of DO, BOD, and Ammonia predicted by the 2006 wasteload allocation were compared against the values predicted by the Qual 2E model with the revised flow for the West Warwick WWTF. Table 2 presents the maximum instream pollutant levels predicted in the 2006 Qual2E WLA and the 2017 Qual2E WLA. As can be seen from this table, the increased West Warwick wastewater flow (10.5 MGD to 11 MGD) resulted in insignificant changes to the predicted instream water quality. As a result, it was determined that modifying the permitted wastewater flow rate for the West Warwick WWTF while keeping the BOD, Ammonia and DO discharge limits for Cranston, Warwick, and West Warwick equal to the previous permit limits would satisfy the antidegradation and antibacksliding requirements of the Rhode Island Water Quality Regulations and the RIPDES Regulations.

Table 2. Maximum Waste Load Allocation (WLA) Instream Concentrations		
	2006 WLA	**2017 WLA**
Dissolved Oxygen	5.0	5.0
Ammonia	0.93	0.93
BOD	4.4	4.4

Permit Limitations Based upon the Metals Wasteload Allocation Modeling

The fate and transport of toxic pollutants were simulated using the computer model PAWTOXIC. Information concerning the calibration and validation of the PAWTOXIC model is presented in A Study of the Water Quality of the Pawtuxet River: Chemical Monitoring and Computer Modeling of Pollutants, Volume 2: Computer Modeling of Toxic Pollutants in the Pawtuxet River (Wright and

McCarthy, 1985) and in Fate and Transport of Heavy Metals in the Pawtuxet River (McCarthy, 1986). The PAWTOXIC model was used to determine the maximum discharge levels for Cadmium, Chromium, Copper, Lead, Nickel, and Silver that would result in compliance with the water quality criteria. Since metals criteria are dependent upon the hardness of the receiving water and it has been observed that there is a strong inverse correlation between river flow and hardness, a lognormal-lognormal relationship was developed between flow and hardness from data collected at the Cranston US Geological Survey gauging station to establish aquatic life criteria for metals. Based on this relationship, a hardness of 63.2 mg/l at the 7Q10 flow was used to determine the appropriate metals criteria. Details of this relationship can be found in the *1999 Permit Development Document*.

As part of their efforts to attain compliance with the 1989 permit limitations, the Communities completed site-specific criteria studies to determine if aquatic life criteria for the Pawtuxet River should be modified. These studies are summarized in the report entitled "*Report on Rhode Island Site Specific Criteria Development Program, April 1992*". As a result of these studies the Rhode Island Water Quality Regulations were revised to establish the site-specific criteria noted in Table 3 below.

Table 3. Pawtuxet River Site Specific Metals Criteria (Hardness = 63.2 mg/L)

Parameter	Acute Criteria	Chronic Criteria
Cadmium	5.14	0.79
Copper	54.87	38.87
Lead	8.65	0.34
Silver	5.25	---
Zinc	129.30	117.12

The metals waste load allocation that was used in 1999 assigned all three communities (West Warwick, Warwick, and Cranston) an equivalent discharge concentration that was set such that the Pawtuxet River's in-stream concentrations would not exceed 90% of the site specific water quality criteria. However, after the final permits were issued in 1999, the City of Cranston decreased their approved design flow. Therefore, due to the decrease in design flow, the DEM subsequently adjusted the Nickel, Copper, Lead, Cadmium, Chromium, and Silver permit limits for the Cranston WWTF in the 2008 permit cycle. To determine the appropriate metals limits, the DEM used an iterative approach and ran the PAWTOXIC model using Cranston's new design flow and various modified metals concentrations for Cranston. This approach was used to determine the maximum metals concentrations that could be discharged from the Cranston facility and not result in an increase in the maximum in-stream concentration predicted for the Pawtuxet River. The results of these model runs conducted in 2006 which were triggered by Cranston's flow modification are reflected in the tables below.

As previously indicated, the Town of West Warwick submitted a Facilities Plan Amendment which called for an increase in its design flow from 10.5 MGD (16.24 cfs) to 11.0 MGD (17.02 cfs) and DEM granted an Order of Approval for the construction of plant phosphorus removal upgrades which were designed based on a future flow of 11.0 MGD. Therefore due to an increase in the approved design flow for the West Warwick WWTF, the DEM took steps to determine what adjustments to the Nickel, Copper, Lead, Cadmium, Chromium, and Silver permit limits were necessary for the West Warwick WWTF. The appropriate metals limits were calculated using an iterative approach by running the PAWTOXIC model using West Warwick's revised design flow from Table 1 and various metals discharge concentrations for West Warwick.

Table 4 lists the maximum discharge concentrations that were used in the final PAWTOXIC model runs in 2006. Table 5 presents the proposed discharge levels for each wastewater facility as determined by the 2017 PAWTOXIC Model runs. The DEM reduced the permit limits for West Warwick only and the reductions to permit limits were made until the model generated in stream concentrations were equivalent (or nearly equivalent) to the modeling conducted in 1999 and 2006. Table 6 and Table 7 present the maximum instream pollutant levels, predicted each time the required changes to model inputs were required. As can be seen from these tables, the increased wastewater flow and decreased metals limits modeled for West Warwick resulted in minimal changes to the instream water quality.

The new limits proposed for the West Warwick WWTF will not result in any significant increase in the in-stream pollutant concentrations. As a result, it was determined that modifying the permitted wastewater flow rate while setting the metals discharge limits equal to those listed in Table 5 will satisfy the antidegradation and antibacksliding requirements of the Rhode Island Water Quality Regulations and the RIPDES Regulations.

Table 4. Maximum Allowable Discharge Levels from 2006 PAWTOXIC Model

	Former Clariant Corp.		W. Warwick & Warwick		Cranston	
Parameter	**Monthly Ave. (ug/l)**	**Daily Max. (ug/l)**	**Monthly Ave. (ug/l)**	**Daily Max. (ug/l)**	**Monthly Ave. (ug/l)**	**Daily Max. (ug/l)**
Nickel	200	1750	185	1750	197	1840
Copper	100	100	40	95	42.2	98
Lead	0.34	8.65	0.34	8.65	0.34	8.65
Cadmium	3.32	9	1	9	1.1	9.6
Chromium	1000	3000	290	2500	312	2700
Silver[1]	---	11	---	11	---	11.9

[1]The RI Water Quality Regulations do not contain chronic water quality criteria for silver, therefore, a monthly average limit could not be calculated.

Table 5. Maximum Allowable Discharge Levels from 2017 PAWTOXIC Model

	Former Clariant Corp.		Warwick		W. Warwick		Cranston	
Parameter	**Monthly Ave. (ug/l)**	**Daily Max. (ug/l)**	**Monthly Ave. (ug/l)**	**Daily Max. (ug/l)**	**Monthly Ave. (ug/l)**	**Daily Max. (ug/l)**	**Monthly Ave. (ug/l)**	**Daily Max. (ug/l)**
Nickel	200	1750	185	1750	180	1698	197	1840
Copper	100	100	40	95	38	92	42.2	98
Lead	0.34	8.65	0.34	8.65	0.34	8.65	0.34	8.65
Cadmium	3.32	9	1	9	0.97	8.8	1.1	9.6
Chromium	1000	3000	290	2500	280	2422	312	2700
Silver[1]	---	11	---	11	---	10.6	---	11.9

[1]The RI Water Quality Regulations do not contain chronic water quality criteria for silver, therefore, a monthly average limit could not be calculated.

Table 6. Comparison of Chronic Criteria to Instream Concentrations

Parameter	Chronic Criteria (ug/l)	90% of Criteria	1999 Maximum Instream Concentration (ug/l)	2006 Maximum Instream Concentration (ug/l)	2017 Maximum Instream Concentration (ug/l)
Nickel	106.94	96.25	96.25	96.18	96.08
Copper	38.87	34.98	24.02	24.01	23.91
Lead*	0.34	0.31	10.59	10.59	10.59
Cadmium	0.79	0.71	0.70	0.70	0.69
Chromium	152.28	137.05	133.66	133.64	133.62

*The Pawtuxet River would violate criteria even if the discharge concentrations for the point sources were set equal to 0.0 ug/l. Therefore, the allowable discharge level for Lead was set equal to the criteria.

Table 7. Comparison of Acute Criteria to Instream Concentrations					
Parameter	**Acute Criteria (ug/l)**	**90% of Criteria (ug/l)**	**1999 Maximum Instream Concentration (ug/l)**	**2006 Maximum Instream Concentration (ug/l)**	**2017 Maximum Instream Concentration (ug/l)**
Nickel	961.96	865.8	872.73	864.92	863.6
Copper	54.87	49.38	49.87	49.05	49.03
Lead*	8.65	7.78	10.59	10.59	10.59
Cadmium	5.14	4.63	4.60	4.59	4.59
Chromium	1207.8	1087.0	1063.34	1062.80	1062.74
Silver	5.25	4.73	4.62	4.6	4.6

*The Pawtuxet River would violate criteria even if the discharge concentrations for the point sources were set equal to 0.0 ug/L. Therefore, the allowable discharge level for Lead was set equal to criteria.

Additional Water Quality Based Permit Limitations

In addition to the pollutant limitations established above, additional water quality based 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 that influence their calculation, and the selection of final permit limitations are included below or in the attached documents. The City's first permit to contain water quality based limits was issued in 1989.

Appendix B of the Water Quality Regulations describes the flows used to determine compliance with human health and aquatic life criteria. The design flow to be utilized for freshwater human health for both carcinogenic and non-carcinogenic pollutants is the harmonic mean flow. The harmonic mean flow is a long-term mean flow value calculated by dividing the number of daily flows analyzed by the sum of the reciprocals of those daily flows. Aquatic life criteria shall not be exceeded at or above the lowest average 7 consecutive day low flow with an average recurrence frequency of once in 10 years (7Q10).

The Pawtuxet River Harmonic Mean flow profile, indicating the variation of flow with respect to distance along the river, was calculated using procedures similar to those followed in the *Pawtuxet River Wasteload Allocation Strategy for the Development of RIPDES Permit Limits (DEM, 1988)* for the development of the 7Q10 flow profile. The Flat River Reservoir flow was calculated using Harmonic Mean Flow data from the Washington USGS gauging station and groundwater incremental flows. Harmonic Mean Flow data from the Cranston USGS gauging station was used to calculate Harmonic Mean Flow/7Q10 ratios. These ratios were then used to recalculate groundwater incremental flows and Scituate Reservoir releases. The spreadsheets used to determine the 7Q10 and Mean Harmonic dilution factors were carried over from the *2008 Permit Development Document* and copies of these spreadsheets have been included in Attachment A-3 of this Fact Sheet.

When determining Ammonia limitations, an exception was made regarding the use of the year-round 7Q10 to determine allowable discharge concentrations. For Ammonia, a seasonal 7Q10 dilution factor was determined for the winter (November 1 – April 30). Use of a seasonal dilution factor for Ammonia was also supported by the fact that Ammonia removal is strongly dependent on temperature (nitrification rate decreases when temperature decreases) and the fact that

Ammonia does not bioaccumulate or accumulate in sediment. A winter 7Q10 flow profile, determined in a manner similar to that used for the Harmonic Mean flow profile, was used to determine the appropriate winter dilution factor. In addition, since Ammonia criteria are dependent on pH and Temperature, the DEM calculated the upper 90% pH and Temperature values and the associated Ammonia criteria for each month. The DEM then used the minimum monthly criteria for the months of November – April and May - October, along with the appropriate dilution factor, when determining the Ammonia limitations. Calculation of the Ammonia limitations is available in Attachment B of the 2008 Permit Development Document entitled *"Calculation of Allowable Acute and Chronic Discharge Limitations Based on Freshwater Aquatic Life Criteria and Human Health Criteria"*. It should be noted that the Ammonia limitations for the months of June – October were based on the dissolved oxygen model since these limits were more stringent than the aquatic toxicity-based limits.

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

b) Using available background concentration data.

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

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

The permit limits noted above were developed by assigning an equivalent discharge concentration to each WWTF. This is consistent with the limits assigned in the 1999 permits. However, subsequent to the issuance of the 1999 permits, the City of Cranston decreased its WWTF's approved design flow. Therefore, as a result of the design flow reduction from 23 MGD to 20.2 MGD in 2007, the DEM modified the allowable discharge concentration limits proportionately to the reduction in flow for the Cranston WWTF so the mass load remains constant. In this 2017 draft permit the applicable permit limitations were not modified due to the fact that water quality criteria and the effluent design flow for the Cranston WWTF have not changed since the permit was last issued in 2008. Applicable permit limitations were modified for West Warwick due to the fact that the effluent design flow for the West Warwick WWTF was increased from 10.5 MGD to 11 MGD. As a result the DEM modified the allowable discharge concentration limits proportionately to the increase in flow for the West Warwick WWTF so that the mass load to the receiving water will remain constant. A spreadsheet which contains a summary of all applicable water quality based limits is included in Attachment A-4 of this document.

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.

Since the analysis outlined above may allow a relaxation of monthly average limits, provided below is a brief introduction to Antibacksliding and Antidegradation; as well as a discussion on how the two policies were used to calculate water quality based limits.

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 backsliding is permissible, the first question that must be answered is whether or not the receiving water is attaining the water quality standard. The Office has determined the most appropriate evaluation of existing water quality is by calculating 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's "*Policy on the Implementation of the Antidegradation Provisions of the Rhode Island Water Quality Regulations July 2006*" (the Policy) establishes four tiers of water quality protection:

Tier 1. In all surface waters, existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.

Tier 2. In waters where the existing water quality exceeds the levels necessary to support the propagation of fish and wildlife and recreation in and on the water, that quality shall be maintained and protected except for insignificant changes in water quality as determined by the Director and in accordance with the Antidegradation Implementation Policy, as amended. In addition, the Director may allow significant degradation, which is determined to be necessary to achieve important economic or social benefits to the State in accordance with the Antidegradation Policy.

Tier 2½. Where high quality waters constitute Special Resource Protection Waters SRPWs[1], there shall be no measurable degradation of the existing water quality necessary to protect the characteristics which cause the waterbody to be designated a SRPW. Notwithstanding that all public drinking water supplies are SRPWs, public drinking water suppliers may undertake temporary and short-term activities within the boundary perimeter of a public drinking water supply impoundment for essential maintenance or to address emergency conditions in order to prevent adverse effect on public health or safety. These activities must comply with the requirements set forth in Tier 1 and Tier 2.

[1]SRPWs are surface waters identified by the Director as having significant recreational or ecological uses.

Tier 3. Where high quality waters constitute an Outstanding Natural Resource ONRWs[2], that water quality shall be maintained and protected. The State may allow some limited activities that result in temporary and short-term changes in the water quality of an ONRW. Such activities must not permanently degrade water quality or result in water quality lower than necessary to protect the existing uses in the ONRW.

The formulas previously presented ensure that permit limitations are based upon water quality criteria and methodologies established to ensure that all designated uses will be met.

In terms of the applicability of Tier 2 of the Policy, a water body is assessed as being high quality on a parameter-by-parameter basis. In accordance with Part II of the Policy, "Antidegradation applies to all new or increased projects or activities which may lower water quality or affect existing water uses, including but not limited to all 401 Water Quality Certification reviews and any new, reissued, or modified RIPDES permits." Part VI.A of the Policy indicates that it is not applicable to activities which result in insignificant (i.e.: short-term minor) changes in water quality and that significant changes in water quality will only be allowed if it is necessary to accommodate important economic and social development in the area in which the receiving waters are located (important benefits demonstration). Part VI.B.4 of the Policy states that: "Theoretically, any new or increased discharge or activity could lower existing water quality and thus require the important benefits demonstration. However, DEM will: 1) evaluate applications on a case-by-case basis, using BPJ and all pertinent and available facts, including scientific and technical data and calculations as provided by the applicant; and 2) determine whether the incremental loss is significant enough to require the important benefits demonstration described below. [If not then as a general rule DEM will allocate no more than 20%.] Some of the considerations which will be made to determine if an impact is significant in each site specific decision are: 1) percent change in water quality parameter value and their temporal distribution; 2) quality and value of the resource; 3) cumulative impact of discharges and activities on water quality to-date; 4) measurability of the change; 5) visibility of the change; 6) impact on fish and wildlife habitat; and 7) impact on potential and existing uses. As a general guide, any discharge or activity which consumes greater than 20% of the remaining assimilative capacity (See Section VI.B.2) will be considered a significant impact and will be required to demonstrate important economic or social benefits to justify the activity (See Section VI.C. below). However, on a case-by-case basis, any proposed percent consumption of the remaining assimilative capacity may be deemed significant and invoke full requirements to demonstrate important economic or social benefits."

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:

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

[2]ONRWs are a special subset of high quality water bodies, identified by the State as having significant recreational or ecological water uses.

where: C_b = background concentration[3] DF = dilution factor
C_d = discharge data[4]

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., $Limit_1$).

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. As explained above, 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 this 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.

Since none of the limits proposed in this permit are less stringent than the limits from the previous permit, the proposed limits comply with the State's antibacksliding and antidegradation policies and additional analysis is not required.

Reasonable Potential

In accordance with 40 CFR 122.4(d)(1)(iii), it is only necessary to establish permit limits for those pollutants in the discharge which have 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) data and annual priority pollutant scan data reported by the permittee. A complete summary of DMR data from December 2008 thru April 2016 is presented in Attachment A-1. Attachment A-5 contains a listing of all priority pollutant scan data detections reported by the permittee from 2011 thru 2015. Attachment A-6 is a summary comparison of the allowable discharge levels vs. the DMR data vs. annual priority pollutant scan detections. Based on the analysis presented above, permit limits are required for Arsenic, Available Cyanide, Lead, and Selenium. Total Ammonia limits have also been included to ensure that the facility continues to nitrify year round. Although Phenol was detected in the discharge the detection only occurred on one of the priority pollutant scan events. As a result permit limits for Phenol have not been applied in this permit. Monitoring for priority pollutants will continue to be required and any additional detections of Phenol will be uncovered during this testing. Should additional detections warrant the need for Phenol limitations the DEM has the authority to modify the permit if necessary. Although Zinc, Cadmium, and Copper limits were applied in the 2008 permit, limitations for these parameters have been removed from the 2017 proposed permit based on the lack of reasonable potential to cause or contribute to the exceedance of instream criteria. As indicated below, monitoring will continue to be required for these pollutants.

The City of Cranston plans to use ferric chloride as the tertiary treatment ballasted flocculation coagulant for phosphorus removal. The City indicated that based on limited sampling data available for the pre-upgrade existing secondary effluent discharge as well as first-hand experience with the proposed tertiary treatment ballasted flocculation process at other municipal facilities (piloting and full-scale operation), the total iron concentration within tertiary effluent/WWTF discharge following completion of upgrade improvements will likely be less than

[3] Data collected at a location that is unimpacted by significant point source discharges.

[4] Discharge 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 alternative period of time.

1,730 ug/l on a monthly average basis, assuming the appropriate coagulant dose is applied. Based on the City of Cranston's intended use of ferric chloride in the treatment process a monthly average limit of 1,733 ug/l has been applied in the permit. As an alternative to ferric chloride the facility may decide to utilize aluminum sulfate (alum) as the preferred flocculation coagulant. For this reason, a monthly average permit limit of 125 ug/l and a daily maximum permit limit of 1080 ug/l Total Aluminum has been included in the permit. Weekly sampling for Total Iron and/or Total Aluminum is only in effect during months in which Iron based or Aluminum based coagulation chemicals are used in the treatment process. For all other periods sampling is only required for Total Aluminum on a quarterly basis in accordance with Part I.B of this permit.

In addition, because the facility uses chlorine disinfection, it was determined that the facility has reasonable potential to cause an exceedance of the chlorine criteria and chlorine limits have been assigned. Finally, although these pollutants did not have "reasonable potential" monitoring for Total Aluminum, Total Cadmium, Total Copper, Hexavalent Chromium, Total Nickel, and Total Zinc have been included in the permit since they are part of the standard list of pollutants monitored as part of the quarterly bioassay testing.

Quantitation Levels

In instances where the permit limit is below the applicable quantitation level, the permit includes a condition that compliance with the limits will be evaluated using the quantitation levels listed in Table 8. These values may be reduced by permit modification as EPA and the State approve more sensitive methods.

Table 8. Quantitation Levels

Parameter	Quantitation Level (ug/l)
Lead	3
Cyanide	10

Conventional Pollutant Permit Limitations

The pH limitations are based upon the secondary treatment requirements in Section 301(b)(1)(B) of the Clean Water Act (CWA), as defined in 40 CFR 133.102 (a)-(c). The "Average Monthly" and "Average Weekly" CBOD and TSS limitations, for November 1 – May 31, are based upon the secondary treatment requirements in Section 301(b)(1)(B) of the Clean Water Act and 40 CFR 133.102(a)-(c). The November 1 – May 31 "Maximum Daily" CBOD and TSS limits are based on Rhode Island requirements for Publicly Owned Treatment Works (POTWs) under Rule 17.04(b) of the RIPDES Regulations and as provided in 40 CFR 123.25. The "Percent Removal" requirements for CBOD and TSS are in accordance with 40 CFR 133.102(a) and (b). CBOD and TSS limits for June 1 – October 31 are based on modeling performed by the DEM. CBOD limitations were used since it was determined that it is appropriate to apply the QUAL 2E modeled limits as CBOD when the point source dischargers are nitrifying. DEM and EPA agree that Total Suspended Solids is an appropriate measure of the solids content being discharged to the receiving waters and that Settleable Solids is a "process-control parameter" that can aid in assessing the operation of the plant but need not be an effluent limit.

The Rhode Island Water Quality Regulations include Enterococci criteria for primary contact/swimming of a geometric mean of 54 colonies/100ml and a single sample maximum of 61 colonies/100ml. The "single sample maximum" value is only used to evaluate swimming advisories at designated public beaches and does not apply to the receiving water in the area of the outfall. EPA's November 12, 2008 memorandum regarding "Initial Zones of Dilution for Bacteria in Rivers and Streams Designated for Primary Contact Recreation" clarifies 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 54 colonies/100ml. The daily maximum enterococci limit has been set at the 90% upper confidence level value for "lightly used full body contact recreation" of 175 colonies/100ml. The DEM has also assigned Fecal Coliform monitoring to ensure that the WWTF is providing treatment that is comparable to historic treatment levels.

Nutrient Limits

Nitrogen:

The Providence and Seekonk Rivers are impacted by low 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 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 even if the wastewater treatment facility (WWTF) discharges are reduced to the limit of technology (total nitrogen of 3 mg/l), the Seekonk River and portions of the Providence River may not fully comply with existing water quality standards for DO. 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 Massachusetts and Rhode Island 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.

Based on this evaluation, the DEM has determined that it would be appropriate to establish seasonal (May – October) limits for total nitrogen of 8.0 mg/l for the Cranston WWTF. 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 addition to adding a seasonal total nitrogen limit of 8.0 mg/l, this permit also requires that the permittee operate the treatment facility to reduce the discharge of total nitrogen, during the months of November through March, 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 the Massachusetts WWTFs is significant and, therefore, DEM is also working with the MADEP and the EPA to pursue appropriate nitrogen reductions at these WWTFs.

An integral component of this phased plan is a water quality reassessment that will evaluate 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. This permit maintains the Total Nitrogen permit limits from the previous permit.

Phosphorus:

Rule 8.D(2), Table 1 of the Rhode Island Water Quality Regulations requires that nutrients shall not be discharged "in such concentration that would impair any usages specifically assigned to said class, or cause undesirable or nuisance aquatic species associated with cultural eutrophication" and also requires that "phosphates shall be removed from existing discharges to the extent that such removal is or may become technically and reasonably feasible." In freshwater systems, phosphorus is typically the limiting nutrient and controls the production of aquatic plants and algae in the water.

As stated previously the segment of the Pawtuxet River that receives the discharge from the Cranston WWTF is currently not supporting the Fish and Wildlife Habitat use due to impairments associated with Total Phosphorus, as provided in the DEM's 303(d) list of impaired waters dated May 2015. Reaches along the Pawtuxet River suffer from cultural eutrophication caused by excessive nutrients entering and accumulating in the river. Because the Pawtuxet River is a freshwater system, excessive levels of phosphorus will promote the growth of nuisance algae and rooted aquatic plants. This excessive algal and/or plant growth results in reduced water clarity and poor aesthetic quality. As a result, the discharge of phosphorus from the Pawtuxet River WWTFs is impairing usages assigned to the Main Stem of the Pawtuxet River by causing the growth of undesirable and nuisance aquatic species and causing cultural eutrophication. Therefore, the DEM determined that in accordance with Rule 8.D(2) of the Rhode Island Water Quality Regulations the discharge of phosphorus must be removed to the lowest levels that are technically and reasonably feasible.

The DEM previously determined that total phosphorus levels of 0.1 mg/l are both technically and reasonably achievable using existing treatment technologies. In addition to ensuring that the 0.1 mg/l total phosphorus limit is technically and reasonably feasible, the DEM also performed an analysis to determine if the 0.1 mg/l limit will be protective of water quality. EPA has produced several guidance documents, which contain recommended total phosphorus criteria for flowing water bodies. The 1986 Quality Criteria of Water ("the Gold Book") recommends in-stream phosphorus concentrations of 0.1 mg/l for any stream not discharging directly to lakes or impoundments. The DEM reviewed the flow characteristics of the Main Stem of the Pawtuxet River to determine if the river is impounded. Based upon this analysis, the DEM has determined that the river is not impounded. Therefore, the recommended total phosphorus criteria that would apply to the Main Stem of the Pawtuxet River from the Gold Book is 0.1 mg/l. In addition, in December 2000, EPA published updated nutrient guidelines, which vary by eco-region. The recommended EPA criteria applicable to Rhode Island waters are described in the document titled *Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Nutrient Ecoregion XIV (EPA 822-B-00-022, December 2000)*. This document identifies the EPA recommended guidelines applicable to Rhode Island waters as 23.75 ug/l in rivers. However, these recommended guidelines do not substitute for the CWA or EPA's regulations, nor are the documents themselves regulations. Thus, they cannot impose legally binding requirements on EPA, States, Indian tribes or the regulated community. Using the WWTF's design flows and 7Q10 flow of the Pawtuxet River, the DEM determined that by assigning a total phosphorus limit of 0.1 mg/l the in-stream phosphorus concentration of the River would fall between the Gold Book and Ecoregion criteria. Therefore, the DEM made a determination that a total phosphorus limit of 0.1 mg/l is appropriate.

The total phosphorus limit (0.1 mg/l) is a monthly average limit in effect from April 1 through October 31. The maximum daily value must also be reported for each month. In addition, the permit also contains a total phosphorus monthly average limit of 1.0 mg/l during November 1 through March 31. The winter period limitation on phosphorus is necessary to ensure that the higher levels of phosphorus discharged in the winter period do not result in the accumulation of phosphorus in the sediments. The limitation assumes that the dissolved fraction of the total phosphorus will pass through the system given the short detention time of the Pawtuxet River and the lack of plant growth during the winter period. A monitoring requirement for orthophosphorus has been included for the winter period in order to determine the particulate fraction. The Total Phosphorus limits in this permit are consistent with the above requirements and the limits from the previous permit.

Bioassay Testing

DEM's toxicity permitting policy is based on past toxicity data and the level of available dilution. Based upon past toxicity results and available dilution, the draft permit requires an $LC_{50} \geq 100\%$ effluent limit for quarterly acute tests. Chronic toxicity testing for Daphnids is required based on the chronic dilution factor of 1.8 being lower than the 10 dilution threshold; thereby requiring a chronic toxicity limit of $\geq 50\%$ effluent. The biomonitoring requirements are set fourth in 40 CFR 131.11 and the State's Water Quality Regulations to assure control of toxicity in the effluent. If toxicity is demonstrated, then toxicity identification and reduction will be 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), 122.44 (i), and 122.48 to yield data representative of the discharge.

The permit contains requirements for the permittee to comply with the State's Rules and Regulations for Sewage Sludge Management and its DEM Order of Approval for sludge disposal in accordance with the requirements of Section 405(d) of the Clean Water Act (CWA). 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 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) and 403.8 because the city receives significant discharges of industrial wastewater.

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.

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:

Abdulrahman Ragab, Sanitary Engineer
Department of Environmental Management/Office of Water Resources
235 Promenade Street
Providence, Rhode Island 02908
Telephone: (401) 222-4700 Ext. 7201
Email: Abed.Ragab@dem.ri.gov

12/5/18
Date

Joseph B. Haberek, PE
Acting Supervising Sanitary Engineer
RIPDES Program
Office of Water Resources
Department of Environmental Management

ATTACHMENT A-1

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

AVERAGE EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE:

PARAMETER	AVERAGE[1]	MAXIMUM[2]
Flow	11.78 MGD	15.70 MGD
Arsenic, Total	4.8 ug/l	8.1 ug/l
BOD_5 Loading	730.2 lb/day	1663.2 lb/day
BOD_5	6.5 mg/l	13.1 mg/l
BOD % Removal (Nov. 1 – May 31)	97.39 % (Minimum)	
CBOD Loading (June 1 – June 30) (Oct. 1 – Oct. 31) (July 1 – Sept. 30)	 407.29 lb/day 233.86 lb/day 289.29 lb/day	 887.14 lb/day 380.00 lb/day 573.26 lb/day
CBOD (June 1 – June 30) (Oct. 1 – Oct. 31) (July 1 – Sept. 30)	 3.57 mg/l 2.29 mg/l 2.86 mg/l	 8.14 mg/l 3.86 mg/l 5.95 mg/l
CBOD % Removal (June 1 – Oct. 31)	98.77 % (Minimum)	
Cadmium	0.28 ug/l	0.48 ug/l
TSS Loading (Nov. 1 – May 31) (June 1 – June 30) (July 1 – Sept. 30) (Oct. 1 – Oct. 31)	 1009.33 lb/day 978.29 lb/day 605.95 lb/day 503.14 lb/day	 2003.87 lb/day 1867.00 lb/day 1074.24 lb/day 1294.43 lb/day
TSS (Nov. 1 – May 31) (June 1 – June 30) (July 1 – Sept. 30) (Oct. 1 – Oct. 31)	 9.39 mg/l 10.29 mg/l 7.38 mg/l 6.00 mg/l	 16.35 mg/l 19.14 mg/l 11.43 mg/l 17.71 mg/l
TSS % Removal	96.09 %	
Settleable Solids		0.05 ml/l
Fecal Coliform	6.22 MPN/100 ml	59.76 MPN/100 ml
pH	6.81 S.U.(Minimum)	7.38 S.U.(Maximum)
Chlorine Total Residual	12.21 ug/l	29.33 ug/l
Cyanide, Total	2.53 ug/l	8.09 ug/l
Lead	0.53 ug/l	1.62 ug/l
Copper, Total	6.72 ug/l	10.68 ug/l
Zinc, Total	42 ug/l	50 ug/l
Total Nitrate, Nitrogen [as N] (Nov. 1 – April 30) (May 1 – Oct. 31)	 4.83 mg/l 4.38 mg/l	 6.88 mg/l 6.01 mg/l
Total Nitrite, Nitrogen [as N] (Nov. 1 – April 30)	 0.08 mg/l	 0.20 mg/l

(May 1 – Oct. 31)	0.02 mg/l	0.17 mg/l
Total Kjeldahl, Nitrogen [as N]		
(Nov. 1 – April 30)	5.03 mg/l	7.60 mg/l
(May 1 – Oct. 31)	3.25 mg/l	5.96 mg/l
Total Nitrogen [as N] Loading		
(Nov. 1 – April 30)	1114.91 lb/day	
(May 1 – Oct. 31)	677.32 lb/day	
Total Nitrogen [as N]		
(Nov. 1 – April 30)	9.88 mg/l	13.01 mg/l
(May 1 – Oct. 31)	7.68 mg/l	11.15 mg/l
Dissolved Oxygen		
(June 1 – Oct. 31)	7.02 mg/l (Minimum)	
Orthophosphorus [as P]		
(Nov. 1 – March 31)	0.64 mg/l	3.82 mg/l
Total Phosphorus [as P]		
(Nov. 1 – March 31)	0.83 mg/l	1.47 mg/l
(April 1 – October 31)	0.64 mg/l	1.30 mg/l
Total Ammonia, Nitrogen [as N]		
(Nov. 1 – April 30)	2.60 mg/l	5.52 mg/l
(May 1 – May 31)	1.36 mg/l	5.19 mg/l
(June 1 – Oct. 31)	1.28 mg/l	3.10 mg/l
Tetrachloroethylene	1 ug/l	1 ug/l

[1]Data represents the mean of the monthly average data from December 2008 – April 2016.

[2]Data represents the mean of the daily maximum data from December 2008 – April 2016.

Whole Effluent Toxicity Testing Results (percent effluent)

Species: Ceriodaphnia Dubia

Monitoring Quarter	LC50 Result	C-NOEC Result
1st Quarter 2014	=100%	=100%
2nd Quarter 2014	=100%	=100%
3rd Quarter 2014	=100%	=100%
4th Quarter 2014	=100%	=100%
1st Quarter 2015	=100%	=50%
2nd Quarter 2015	=100%	=13%
3rd Quarter 2015	=100%	=25%
4th Quarter 2015	=100%	=38%
1st Quarter 2016	=100%	=50%

Species: Pimephales Promelas

Monitoring Quarter	LC50 Result	Monitoring Quarter	LC50 Result
1st Quarter 2014	=100%	2nd Quarter 2015	=100%
2nd Quarter 2014	=100%	3rd Quarter 2015	=100%
3rd Quarter 2014	=100%	4th Quarter 2015	=100%
4th Quarter 2014	=100%	1st Quarter 2016	=100%
1st Quarter 2015	=100%		

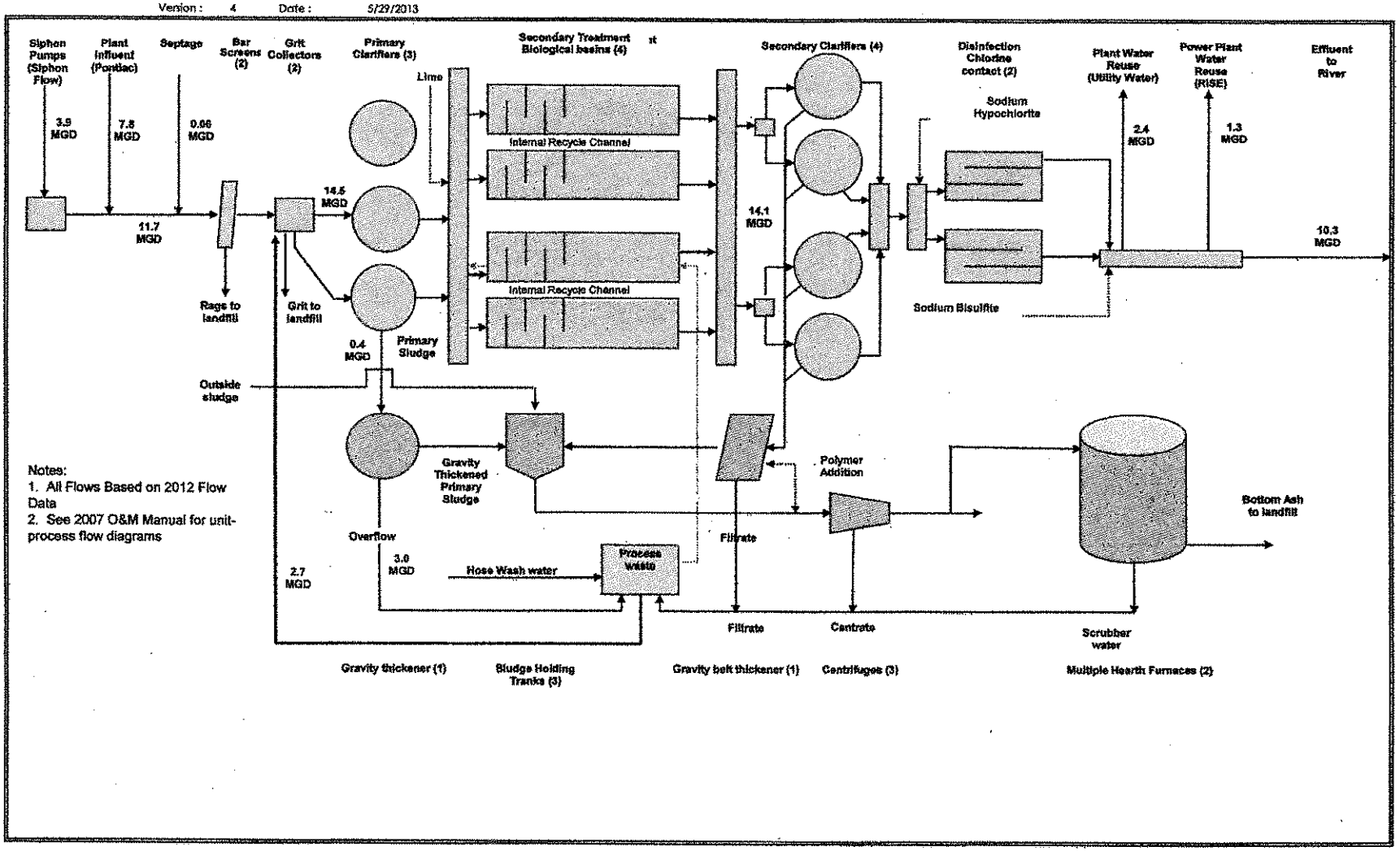
ATTACHMENT A-2

Cranston WPCF Treatment Process Schematic

CRANSTON WPCF

PROCESS SCHEMATIC

Version : 4 Date : 5/29/2013



Notes:

1. All Flows Based on 2012 Flow Data
2. See 2007 O&M Manual for unit-process flow diagrams

ATTACHMENT A-3

Pawtuxet River Flow Profile

ITERATIONS FOR CYANIDE USING PRELIMINARY DESIGN FLOWS

Cyanide Criteria	22	Ratio of Hoechst to WWTF Limit	5
80% of Criteria	17.6		
7Q10 River Flow Upstream of Hoechst	20.05	Hoechst Celanese Flow	1.62
7Q10 River Flow Upstream of W. Warwick	52.26	West Warwick Flow	16.24
7Q10 River Flow Upstream of Warwick	77.05	Warwick Flow	11.91
7Q10 River Flow Upstream of Cranston	92.65	Cranston Flow	35.58
Ground Water Upstream of Hoechst	0.1	Total Flow Downstream of Hoechst	21.77
Ground Water Upstream of W. Warwick	0.82	Total Flow Downstream of W. Warwick	69.32
Ground Water Upstream of Warwick	0.27	Total Flow Downstream of Warwick	89.23
Ground Water Upstream of Cranston	2.04	Total Flow Downstream of Cranston	130.27

River concentration up of Hoe.	0
POTW Effluent Concentration	31.91914
POTW Dilution Factor	**1.813588**
Hoechst Effluent Concentration	159.5957
Hoechst Dilution Factor	9.067938

Hoechst-Cel.	Before W.W	West Warw.	Before War.	Warwick	Before Crans	Cranston
11.87621	11.44511	11.20762	11.16413	12.96726	12.67743	17.6

ITERATIONS FOR CYANIDE USING PRELIMINARY DESIGN FLOWS

Cyanide Criteria	22	Ratio of Hoechst to WWTF Limit	5
80% of Criteria	17.6		
7Q10 River Flow Upstream of Hoechst	35.56	Hoechst Celanese Flow	1.62
7Q10 River Flow Upstream of W. Warwick	76	West Warwick Flow	16.24
7Q10 River Flow Upstream of Warwick	103.1	Warwick Flow	11.91
7Q10 River Flow Upstream of Cranston	119.7	Cranston Flow	35.58
Ground Water Upstream of Hoechst	0.13	Total Flow Downstream of Hoechst	37.31
Ground Water Upstream of W. Warwick	1.04	Total Flow Downstream of W. Warwick	93.28
Ground Water Upstream of Warwick	0.35	Total Flow Downstream of Warwick	115.36
Ground Water Upstream of Cranston	2.59	Total Flow Downstream of Cranston	157.87

River concentration up of Hoe.	0
POTW Effluent Concentration	38.68178
POTW Dilution Factor	**2.197828**
Hoechst Effluent Concentration	193.4089
Hoechst Dilution Factor	10.98914

Hoechst-Cel.	Before W.W	West Warw.	Before War.	Warwick	Before Crans.	Cranston
8.397813	8.170075	10.09342	10.05569	12.15512	11.88821	17.6

ITERATIONS FOR CYANIDE USING PRELIMINARY DESIGN FLOWS

Cyanide Criteria	22	Ratio of Hoechst to WWTF Limit	5
80% of Criteria	17.6		
Mean Harmonic River Flow Upstream of Hoechst	66.97	Hoechst Celanese Flow	1.62
Mean Harmonic River Flow Upstream of W. Warwick	155.58	West Warwick Flow	16.24
Mean Harmonic River Flow Upstream of Warwick	196.2	Warwick Flow	11.91
Mean Harmonic River Flow Upstream of Cranston	218.64	Cranston Flow	35.58
Ground Water Upstream of Hoechst	0.28	Total Flow Downstream of Hoechst	68.87
Ground Water Upstream of W. Warwick	2.34	Total Flow Downstream of W. Warwick	174.16
Ground Water Upstream of Warwick	0.79	Total Flow Downstream of Warwick	208.9
Ground Water Upstream of Cranston	5.82	Total Flow Downstream of Cranston	260.04

River concentration up of Hoe.	0
POTW Effluent Concentration	63.71577
POTW Dilution Factor	**3.620214**
Hoechst Effluent Concentration	318.5789
Hoechst Dilution Factor	18.10107

Hoechst-Cel.	Before W.W	West Warw.	Before War.	Warwick	Before Crans	Cranston
7.493796	7.247546	8.904696	8.864487	11.05647	10.75678	17.6

ATTACHMENT A-4

Summary of Applicable Water Quality Based Limits

CALCULATION OF WATER QUALITY BASED NON-CLASS AA FRESHWATER DISCHARGE LIMITS

FACILITY SPECIFIC DATA INPUT SHEET

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

FACILITY NAME: **Cranston**

RIPDES PERMIT #: **RI0100013**

	DISSOLVED BACKGROUND DATA (ug/L)	ACUTE METAL TRANSLATOR	CHRONIC METAL TRANSLATOR
ALUMINUM	**NA**	**NA**	**NA**
ARSENIC	**NA**	**1**	**1**
CADMIUM	**NA**	**modeled**	**modeled**
CHROMIUM III	**NA**	**modeled**	**modeled**
CHROMIUM VI	**NA**	**modeled**	**modeled**
COPPER	**NA**	**modeled**	**modeled**
LEAD	**NA**	**modeled**	**modeled**
MERCURY	**NA**	**0.85**	**0.85**
NICKEL	**NA**	**modeled**	**modeled**
SELENIUM	**NA**	**NA**	**NA**
SILVER	**NA**	**modeled**	**NA**
ZINC	**NA**	**0.978**	**0.986**
AMMONIA (as N)	**NA**		

USE NA WHEN NO DATA IS AVAILABLE

NOTE 1: METAL TRANSLATORS FROM RI WATER QUALITY REGS.

pH = See Ammonia Input Sheet
HARDNESS = 63.2 (mg/L as CaCo3)

DILUTION FACTORS	
ACUTE =	**1.8**
CHRONIC =	**1.8**
(MAY-OCT) =	**1.8**
(NOV-APR) =	**2.2**
HARMONIC FLOW =	**3.6**
HARMONIC FLOW =	**3.6**

WATER QUALITY BASED EFFLUENT LIMITS - FRESHWATER

CALCULATION OF WATER QUALITY BASED NON-CLASS AA FRESHWATER DISCHARGE LIMITS

Facility Name: Cranston RIPDES PERMIT #. RI0100013

Month	Upper 90th% pH	Upper 90th% Temp (C)	Acute Criteria * ug/L as N	Chronic Criteria* ug/L as N
May	6.7	15.4	44.6	6.09
Jun	6.6	21	46.8	4.32
Jul	6.6	23	46.8	3.80
Aug	6.7	22.8	44.6	3.78
Sep	6.7	19.9	44.6	4.55
Oct	6.7	14.8	44.6	6.33
Nov	6.6	9.6	46.8	9.02
Dec	6.9	5.1	39.1	9.93
Jan	7	2.1	36.1	9.60
Feb	6.8	3.1	42	10.22
Mar	6.7	5.7	44.6	10.46
Apr	6.8	10.7	42	8.05

**NOTE: Criteria from Appendix B of the RI Water Quality Regs., July 2006.*

CALCULATION OF WATER QUALITY BASED NON-CLASS AA FRESHWATER DISCHARGE LIMITS

FACILITY NAME: Cranston RIPDES PERMIT #: RI0100013

NOTE: METALS CRITERIA ARE EXPRESSED AS DISSOLVED, METALS LIMITS ARE EXPRESSED AS TOTAL

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	FRESHWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	FRESHWATER 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		450	648	10	640	14.4
ARSENIC (limits are total recoverable)	7440382	NA	340	489.6	150	1.4	4.032
ASBESTOS	1332214			No Criteria			No Criteria
BERYLLIUM	7440417		7.5	10.8	0.17		0.2448
CADMIUM (limits are total recoverable)	7440439	NA	#NUM!	see dev doc	#NUM!		see dev doc
CHROMIUM III (limits are total recoverable)	16065831	NA	#NUM!	see dev doc	#NUM!		see dev doc
CHROMIUM VI (limits are total recoverable)	18540299	NA	16	see dev doc	11		see dev doc
COPPER (limits are total recoverable)	7440508	NA	#NUM!	see dev doc	#NUM!		see dev doc
CYANIDE	57125		22	31.68	5.2	140	7.488
LEAD (limits are total recoverable)	7439921	NA	#NUM!	see dev doc	#NUM!		see dev doc
MERCURY (limits are total recoverable)	7439976	NA	1.4	2.371764706	0.77	0.15	0.508235294
NICKEL (limits are total recoverable)	7440020	NA	#NUM!	see dev doc	#NUM!	4600	see dev doc
SELENIUM (limits are total recoverable)	7782492	NA	20	28.8	5	4200	7.2
SILVER (limits are total recoverable)	7440224	NA	#NUM!	see dev doc	NA		see dev doc
THALLIUM	7440280		46	66.24	1	0.47	1.3536
ZINC (limits are total recoverable)	7440666	NA	129.3010814	186	#NUM!	26000	see dev doc
VOLATILE ORGANIC COMPOUNDS							
ACROLEIN	107028		2.9	4.176	0.06	290	0.0864
ACRYLONITRILE	107131		378	544.32	8.4	2.5	7.2
BENZENE	71432		265	381.6	5.9	510	8.496
BROMOFORM	75252		1465	2109.6	33	1400	47.52
CARBON TETRACHLORIDE	56235		1365	1965.6	30	16	43.2
CHLOROBENZENE	108907		795	1144.8	18	1600	25.92
CHLORODIBROMOMETHANE	124481			No Criteria		130	374.4
CHLOROFORM	67663		1445	2080.8	32	4700	46.08
DICHLOROBROMOMETHANE	75274			No Criteria		170	489.6
1,2DICHLOROETHANE	107062		5900	8496	131	370	188.64
1,1DICHLOROETHYLENE	75354		580	835.2	13	7100	18.72
1,2DICHLOROPROPANE	78875		2625	3780	58	150	83.52
1,3DICHLOROPROPYLENE	542756			No Criteria		21	60.48
ETHYLBENZENE	100414		1600	2304	36	2100	51.84
BROMOMETHANE (methyl bromide)	74839			No Criteria		1500	4320
CHLOROMETHANE (methyl chloride)	74873			No Criteria			No Criteria
METHYLENE CHLORIDE	75092		9650	13896	214	5900	308.16

CALCULATION OF WATER QUALITY BASED NON-CLASS AA FRESHWATER DISCHARGE LIMITS

FACILITY NAME: Cranston RIPDES PERMIT #: RI0100013

NOTE: METALS CRITERIA ARE EXPRESSED AS DISSOLVED, METALS LIMITS ARE EXPRESSED AS TOTAL

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	FRESHWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	FRESHWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
1,1,2,2TETRACHLOROETHANE	79345		466	671.04	10	40	14.4
TETRACHLOROETHYLENE	127184		240	345.6	5.3	33	7.632
TOLUENE	108883		635	914.4	14	15000	20.16
1,2TRANSDICHLOROETHYLENE	156605			No Criteria		10000	28800
1,1,1TRICHLOROETHANE	71556			No Criteria			No Criteria
1,1,2TRICHLOROETHANE	79005		900	1296	20	160	28.8
TRICHLOROETHYLENE	79016		1950	2808	43	300	61.92
VINYL CHLORIDE	75014			No Criteria		2.4	6.912
ACID ORGANIC COMPOUNDS							
2CHLOROPHENOL	95578		129	185.76	2.9	150	4.176
2,4DICHLOROPHENOL	120832		101	145.44	2.2	290	3.168
2,4DIMETHYLPHENOL	105679		106	152.64	2.4	850	3.456
4,6DINITRO2METHYL PHENOL	534521			No Criteria		280	806.4
2,4DINITROPHENOL	51285		31	44.64	0.69	5300	0.9936
4NITROPHENOL	88755			No Criteria			No Criteria
PENTACHLOROPHENOL	87865		#NUM!	No Criteria	#NUM!	30	86.4
PHENOL	108952		251	361.44	5.6	1700000	8.064
2,4,6TRICHLOROPHENOL	88062		16	23.04	0.36	24	0.5184
BASE NEUTRAL COMPUNDS							
ACENAPHTHENE	83329		85	122.4	1.9	990	2.736
ANTHRACENE	120127			No Criteria		40000	115200
BENZIDINE	92875			No Criteria		0.002	0.00576
POLYCYCLIC AROMATIC HYDROCARBONS				No Criteria		0.18	0.5184
BIS(2CHLOROETHYL)ETHER	111444			No Criteria		5.3	15.264
BIS(2CHLOROISOPROPYL)ETHER	108601			No Criteria		65000	187200
BIS(2ETHYLHEXYL)PHTHALATE	117817		555	799.2	12	22	17.28
BUTYL BENZYL PHTHALATE	85687		85	122.4	1.9	1900	2.736
2CHLORONAPHTHALENE	91587			No Criteria		1600	4608
1,2DICHLOROBENZENE	95501		79	113.76	1.8	1300	2.592
1,3DICHLOROBENZENE	541731		390	561.6	8.7	960	12.528
1,4DICHLOROBENZENE	106467		56	80.64	1.2	190	1.728
3,3DICHLOROBENZIDENE	91941			No Criteria		0.28	0.8064
DIETHYL PHTHALATE	84662		2605	3751.2	58	44000	83.52
DIMETHYL PHTHALATE	131113		1650	2376	37	1100000	53.28
DI-n-BUTYL PHTHALATE	84742			No Criteria		4500	12960
2,4DINITROTOLUENE	121142		1550	2232	34	34	48.96

CALCULATION OF WATER QUALITY BASED NON-CLASS AA FRESHWATER DISCHARGE LIMITS

FACILITY NAME: Cranston RIPDES PERMIT #: RI0100013

NOTE: METALS CRITERIA ARE EXPRESSED AS DISSOLVED, METALS LIMITS ARE EXPRESSED AS TOTAL

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	FRESHWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	FRESHWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
1,2DIPHENYLHYDRAZINE	122667		14	20.16	0.31	2	0.4464
FLUORANTHENE	206440		199	286.56	4.4	140	6.336
FLUORENE	86737			No Criteria		5300	15264
HEXACHLOROBENZENE	118741			No Criteria		0.0029	0.008352
HEXACHLOROBUTADIENE	87683			No Criteria		180	518.4
HEXACHLOROCYCLOPENTADIENE	77474		0.35	0.504	0.008	1100	0.01152
HEXACHLOROETHANE	67721		49	70.56	1.1	33	1.584
ISOPHORONE	78591		5850	8424	130	9600	187.2
NAPHTHALENE	91203		115	165.6	2.6		3.744
NITROBENZENE	98953		1350	1944	30	690	43.2
N-NITROSODIMETHYLAMINE	62759			No Criteria		30	86.4
N-NITROSODI-N-PROPYLAMINE	621647			No Criteria		5.1	14.688
N-NITROSODIPHENYLAMINE	86306		293	421.92	6.5	60	9.36
PYRENE	129000			No Criteria		4000	11520
1,2,4trichlorobenzene	120821		75	108	1.7	70	2.448
PESTICIDES/PCBs							
ALDRIN	309002		3	4.32		0.0005	0.00144
Alpha BHC	319846			No Criteria		0.049	0.14112
Beta BHC	319857			No Criteria		0.17	0.4896
Gamma BHC (Lindane)	58899		0.95	1.368		1.8	5.184
CHLORDANE	57749		2.4	3.456	0.0043	0.0081	0.006192
4,4DDT	50293		1.1	1.584	0.001	0.0022	0.00144
4,4DDE	72559			No Criteria		0.0022	0.006336
4,4DDD	72548			No Criteria		0.0031	0.008928
DIELDRIN	60571		0.24	0.3456	0.056	0.00054	0.0015552
ENDOSULFAN (alpha)	959988		0.22	0.3168	0.056	89	0.08064
ENDOSULFAN (beta)	33213659		0.22	0.3168	0.056	89	0.08064
ENDOSULFAN (sulfate)	1031078			No Criteria		89	256.32
ENDRIN	72208		0.086	0.12384	0.036	0.06	0.05184
ENDRIN ALDEHYDE	7421934			No Criteria		0.3	0.864
HEPTACHLOR	76448		0.52	0.7488	0.0038	0.00079	0.0022752
HEPTACHLOR EPOXIDE	1024573		0.52	0.7488	0.0038	0.00039	0.0011232
POLYCHLORINATED BIPHENYLS3	1336363			No Criteria	0.014	0.00064	0.0018432
2,3,7,8TCDD (Dioxin)	1746016			No Criteria		0.000000051	1.4688E-07
TOXAPHENE	8001352		0.73	1.0512	0.0002	0.0028	0.000288
TRIBUTYLTIN			0.46	0.6624	0.072		0.10368

CALCULATION OF WATER QUALITY BASED NON-CLASS AA FRESHWATER DISCHARGE LIMITS

FACILITY NAME: Cranston RIPDES PERMIT #: RI0100013

NOTE: METALS CRITERIA ARE EXPRESSED AS DISSOLVED, METALS LIMITS ARE EXPRESSED AS TOTAL

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	FRESHWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	FRESHWATER 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	750	1080	87		125.28
AMMONIA as N(winter/summer)	7664417		36.1 | 44.6	63536 | 64224	8.05 | 3.78		14171.1 | 5439
4BROMOPHENYL PHENYL ETHER			18	25.92	0.4		0.576
CHLORIDE	16887006		860000	1238400	230000		349600
CHLORINE	7782505		19	34.2	11		19.8
4CHLORO2METHYLPHENOL			15	21.6	0.32		0.4608
1CHLORONAPHTHALENE			80	115.2	1.8		2.592
4CHLOROPHENOL	106489		192	276.48	4.3		6.192
2,4DICHLORO6METHYLPHENOL			22	31.68	0.48		0.6912
1,1DICHLOROPROPANE			1150	1656	26		37.44
1,3DICHLOROPROPANE	142289		303	436.32	6.7		9.648
2,3DINITROTOLUENE			17	24.48	0.37		0.5328
2,4DINITRO6METHYL PHENOL			12	17.28	0.26		0.3744
IRON	7439896			No Criteria	1000		1520
pentachlorobenzene	608935		13	18.72	0.28		0.4032
PENTACHLOROETHANE			362	521.28	8		11.52
1,2,3,5tetrachlorobenzene			321	462.24	7.1		10.224
1,1,1,2TETRACHLOROETHANE	630206		980	1411.2	22		31.68
2,3,4,6TETRACHLOROPHENOL	58902		7	10.08	0.16		0.2304
2,3,5,6TETRACHLOROPHENOL			8.5	12.24	0.19		0.2736
2,4,5TRICHLOROPHENOL	95954		23	33.12	0.51		0.7344
2,4,6TRINITROPHENOL	88062		4235	6098.4	94		135.36
XYLENE	1330207		133	191.52	3		4.56

CALCULATION OF WATER QUALITY BASED NON-CLASS AA FRESHWATER DISCHARGE LIMITS

FACILITY NAME: CRANSTON RIPDES PERMIT #:RI0100013

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
PRIORITY POLLUTANTS:			
TOXIC METALS AND CYANIDE			
ANTIMONY	7440360	648.00	14.40
ARSENIC, TOTAL	7440382	489.60	4.03
ASBESTOS	1332214	No Criteria	0.00
BERYLLIUM	7440417	10.80	0.24
CADMIUM, TOTAL	7440439	see dev doc	see dev doc
CHROMIUM III, TOTAL	16065831	see dev doc	see dev doc
CHROMIUM VI, TOTAL	18540299	see dev doc	see dev doc
COPPER, TOTAL	7440508	see dev doc	see dev doc
CYANIDE	57125	31.68	7.49
LEAD, TOTAL	7439921	see dev doc	see dev doc
MERCURY, TOTAL	7439976	2.37	0.51
NICKEL, TOTAL	7440020	see dev doc	see dev doc
SELENIUM, TOTAL	7782492	28.80	7.20
SILVER, TOTAL	7440224	see dev doc	see dev doc
THALLIUM	7440280	66.24	1.35
ZINC, TOTAL	7440666	186.00	see dev doc
VOLATILE ORGANIC COMPOUNDS			
ACROLEIN	107028	4.18	0.09
ACRYLONITRILE	107131	544.32	7.20
BENZENE	71432	381.60	8.50
BROMOFORM	75252	2109.60	47.52
CARBON TETRACHLORIDE	56235	1965.60	43.20
CHLOROBENZENE	108907	1144.80	25.92
CHLORODIBROMOMETHANE	124481	No Criteria	374.40
CHLOROFORM	67663	2080.80	46.08
DICHLOROBROMOMETHANE	75274	No Criteria	489.60
1,2DICHLOROETHANE	107062	8496.00	188.64
1,1DICHLOROETHYLENE	75354	835.20	18.72
1,2DICHLOROPROPANE	78875	3780.00	83.52
1,3DICHLOROPROPYLENE	542756	No Criteria	60.48
ETHYLBENZENE	100414	2304.00	51.84
BROMOMETHANE (methyl bromide)	74839	No Criteria	4320.00
CHLOROMETHANE (methyl chloride)	74873	No Criteria	0.00
METHYLENE CHLORIDE	75092	13896.00	308.16
1,1,2,2TETRACHLOROETHANE	79345	671.04	14.40
TETRACHLOROETHYLENE	127184	345.60	7.63
TOLUENE	108883	914.40	20.16
1,2TRANSDICHLOROETHYLENE	156605	No Criteria	28800.00
1,1,1TRICHLOROETHANE	71556	No Criteria	0.00
1,1,2TRICHLOROETHANE	79005	1296.00	28.80
TRICHLOROETHYLENE	79016	2808.00	61.92
VINYL CHLORIDE	75014	No Criteria	6.91
ACID ORGANIC COMPOUNDS			
2CHLOROPHENOL	95578	185.76	4.18
2,4DICHLOROPHENOL	120832	145.44	3.17
2,4DIMETHYLPHENOL	105679	152.64	3.46
4,6DINITRO2METHYL PHENOL	534521	No Criteria	806.40
2,4DINITROPHENOL	51285	44.64	0.99
4NITROPHENOL	88755	No Criteria	0.00
PENTACHLOROPHENOL	87865	No Criteria	86.40
PHENOL	108952	361.44	8.06
2,4,6TRICHLOROPHENOL	88062	23.04	0.52
BASE NEUTRAL COMPUNDS			
ACENAPHTHENE	83329	122.40	2.74
ANTHRACENE	120127	No Criteria	115200.00
BENZIDINE	92875	No Criteria	0.01
PAHs		No Criteria	0.52
BIS(2CHLOROETHYL)ETHER	111444	No Criteria	15.26
BIS(2CHLOROISOPROPYL)ETHER	108601	No Criteria	187200.00
BIS(2ETHYLHEXYL)PHTHALATE	117817	799.20	17.28
BUTYL BENZYL PHTHALATE	85687	122.40	2.74
2CHLORONAPHTHALENE	91587	No Criteria	4608.00
1,2DICHLOROBENZENE	95501	113.76	2.59
1,3DICHLOROBENZENE	541731	561.60	12.53
1,4DICHLOROBENZENE	106467	80.64	1.73
3,3DICHLOROBENZIDENE	91941	No Criteria	0.81
DIETHYL PHTHALATE	84662	3751.20	83.52
DIMETHYL PHTHALATE	131113	2376.00	53.28
DI-n-BUTYL PHTHALATE	84742	No Criteria	12960.00
2,4DINITROTOLUENE	121142	2232.00	48.96
1,2DIPHENYLHYDRAZINE	122667	20.16	0.45
FLUORANTHENE	206440	286.56	6.34

CALCULATION OF WATER QUALITY BASED NON-CLASS AA FRESHWATER DISCHARGE LIMITS

FACILITY NAME: CRANSTON RIPDES PERMIT #:RI0100013

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
FLUORENE	86737	No Criteria	15264.00
HEXACHLOROBENZENE	118741	No Criteria	0.01
HEXACHLOROBUTADIENE	87683	No Criteria	518.40
HEXACHLOROCYCLOPENTADIENE	77474	0.50	0.01
HEXACHLOROETHANE	67721	70.56	1.58
ISOPHORONE	78591	8424.00	187.20
NAPHTHALENE	91203	165.60	3.74
NITROBENZENE	98953	1944.00	43.20
N-NITROSODIMETHYLAMINE	62759	No Criteria	86.40
N-NITROSODI-N-PROPYLAMINE	621647	No Criteria	14.69
N-NITROSODIPHENYLAMINE	86306	421.92	9.36
PYRENE	129000	No Criteria	11520.00
1,2,4trichlorobenzene	120821	108.00	2.45
PESTICIDES/PCBs			
ALDRIN	309002	4.32	0.00
Alpha BHC	319846	No Criteria	0.14
Beta BHC	319857	No Criteria	0.49
Gamma BHC (Lindane)	58899	1.37	1.37
CHLORDANE	57749	3.46	0.01
4,4DDT	50293	1.58	0.00
4,4DDE	72559	No Criteria	0.01
4,4DDD	72548	No Criteria	0.01
DIELDRIN	60571	0.35	0.00
ENDOSULFAN (alpha)	959988	0.32	0.08
ENDOSULFAN (beta)	33213659	0.32	0.08
ENDOSULFAN (sulfate)	1031078	No Criteria	256.32
ENDRIN	72208	0.12	0.05
ENDRIN ALDEHYDE	7421934	No Criteria	0.86
HEPTACHLOR	76448	0.75	0.00
HEPTACHLOR EPOXIDE	1024573	0.75	0.00
POLYCHLORINATED BIPHENYLS3	1336363	No Criteria	0.00
2,3,7,8TCDD (Dioxin)	1746016	No Criteria	0.00
TOXAPHENE	8001352	1.05	0.00
TRIBUTYLTIN		0.66	0.10

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
NON PRIORITY POLLUTANTS:			
OTHER SUBSTANCES			
ALUMINUM, TOTAL	7429905	1080.00	125.28
AMMONIA (as N), WINTER (NOV-AP	7664417	63536.00	14171.09
AMMONIA (as N), SUMMER (MAY-O	7664417	64224.00	5439.31
4BROMOPHENYL PHENYL ETHER		25.92	0.58
CHLORIDE	16887006	1238400.00	349600.00
CHLORINE	7782505	34.20	19.80
4CHLORO2METHYLPHENOL		21.60	0.46
1CHLORONAPHTHALENE		115.20	2.59
4CHLOROPHENOL	106489	276.48	6.19
2,4DICHLORO6METHYLPHENOL		31.68	0.69
1,1DICHLOROPROPANE		1656.00	37.44
1,3DICHLOROPROPANE	142289	436.32	9.65
2,3DINITROTOLUENE		24.48	0.53
2,4DINITRO6METHYL PHENOL		17.28	0.37
IRON	7439896	No Criteria	1520.00
pentachlorobenzene	608935	18.72	0.40
PENTACHLOROETHANE		521.28	11.52
1,2,3,5tetrachlorobenzene		462.24	10.22
1,1,1,2TETRACHLOROETHANE	630206	1411.20	31.68
2,3,4,6TETRACHLOROPHENOL	58902	10.08	0.23
2,3,5,6TETRACHLOROPHENOL		12.24	0.27
2,4,5TRICHLOROPHENOL	95954	33.12	0.73
2,4,6TRINITROPHENOL	88062	6098.40	135.36
XYLENE	1330207	191.52	4.56

ATTACHMENT A-5

Priority Pollutant Scan Summary Data

Cranston WWTF - RIPDES Permit No. RI0100013

Summary of Effluent Priority Pollutant Scan Detections

Parameter (ug/l)	2011	2012	2013	2014	3rd Qtr. 2015	4th Qtr. 2015	Average	Maximum
Cyanide	30	20	30	0	20	0	16.67	30
Chromium III	3	2.6	2.6	0	1.1	0	1.55	3
Nickel	14	11	12	0	23	13	12.17	23
Copper	5	7.1	8	0	8.5	4.4	5.50	8.5
Zinc	24	23	21	0	34	38	23.33	38
Arsenic	6	4.2	6.4	0	2.2	3.6	3.73	6.4
Selenium	4	2.4	9.5	0	27	28	11.82	28
Antimony	2	2.4	0	0	0	0	0.73	2.4
Barium	5	0	0	0	0	0	0.83	5
Chloroform	7.1	10	25	0	6	17	10.85	25
Bromodichloromethane	2.4	10	14	0	4	6	6.07	14
Total Phenol	0	10	0	0	0	0	1.67	10
Dibromochloromethane	0	0	7	0	3	3	2.17	7
Cadmium	0	0	0.12	0	0	0	0.02	0.12
Bis (2-ethylhexyl)phthalate	0	0	0	5.1	4.1	0	1.53	5.1

ATTACHMENT A-6

Comparison of Allowable Limits with Discharge Monitoring Report Data and Annual Priority Pollutant Scan Data

Facility Name: *Cranston WWTF*

RIPDES Permit #: *RI0100013*

Outfall #: *001A*

NOTE: METALS LIMITS ARE TOTAL METALS

Parameter	CAS #	Concentration Limits (ug/L) Based on WQ Criteria		Antideg. Limits (ug/L)	Priority Pollutant Scan Data (ug/l) 2011 - 2015		Ave. DMR Data (ug/L) Dec. 2008 - Apr. 2016		Assigned Permit Limits (ug/L)	
		Daily Max	Monthly Ave	Monthly Ave	Max	Ave	Daily Max	Monthly Ave	Daily Max	Monthly Ave
PRIORITY POLLUTANTS										
TOXIC METALS AND CYANIDE										
ANTIMONY	7440360	738.72	16.42	---	2.4	0.73	---	---	No RP	No RP
ARSENIC (limits are total recoverable)	7440382	558.14	4.60	---	6.4	3.73	8.1	4.8	558.14	4.60
ASBESTOS	1332214	No Criteria	0.00	---	---	---	---	---	No RP	No RP
BERYLLIUM	7440417	12.31	0.28	---	---	---	---	---	No RP	No RP
CADMIUM (limits are total recoverable)	7440439	9.6*	1.1*	---	0.12	0.02	0.48	0.28	No RP	No RP
CHROMIUM III (limits are total recoverable)	16065831	951.01	45.45	---	3	1.55	---	---	No RP	No RP
CHROMIUM VI (limits are total recoverable)	18540299	2700*	312*	---	---	---	---	---	No RP	No RP
COPPER (limits are total recoverable)	7440508	98*	42.2*	---	8.5	5.5	10.68	6.72	No RP	No RP
CYANIDE	57125	36.12	8.54	---	30	16.67	8.09	2.53	36.12	8.54
LEAD (limits are total recoverable)	7439921	8.65*	0.34*	---	---	---	1.62	0.53	8.65*	0.34*
MERCURY (limits are total recoverable)	7439976	2.70	0.58	---	---	---	---	---	No RP	No RP
NICKEL (limits are total recoverable)	7440020	1840*	197*	---	23	12.17	---	---	No RP	No RP
SELENIUM (limits are total recoverable)	7782492	32.83	8.21	---	28	11.82	---	---	32.83	8.21
SILVER (limits are total recoverable)	7440224	11.9*	No Criteria	---	---	---	---	---	No RP	No RP
THALLIUM	7440280	75.51	1.54	---	---	---	---	---	No RP	No RP
ZINC (limits are total recoverable)	7440666	212.04	127.00	127	38	23.33	50	42	No RP	No RP
VOLATILE ORGANIC COMPOUNDS										
ACROLEIN	107028	4.76	0.10	---	---	---	---	---	No RP	No RP
ACRYLONITRILE	107131	620.52	8.21	---	---	---	---	---	No RP	No RP
BENZENE	71432	435.02	9.69	---	---	---	---	---	No RP	No RP
BROMOFORM	75252	2404.94	54.17	---	---	---	---	---	No RP	No RP
CARBON TETRACHLORIDE	56235	2240.78	49.25	---	---	---	---	---	No RP	No RP
CHLOROBENZENE	108907	1305.07	29.55	---	---	---	---	---	No RP	No RP
CHLORODIBROMOMETHANE	124481	No Criteria	426.82	---	---	---	---	---	No RP	No RP
CHLOROFORM	67663	2372.11	52.53	---	25	10.85	---	---	No RP	No RP
DICHLOROBROMOMETHANE	75274	No Criteria	558.14	---	---	---	---	---	No RP	No RP
1,2DICHLOROETHANE	107062	9685.44	215.05	---	---	---	---	---	No RP	No RP
1,1DICHLOROETHYLENE	75354	952.13	21.34	---	---	---	---	---	No RP	No RP
1,2DICHLOROPROPANE	78875	4309.20	95.21	---	---	---	---	---	No RP	No RP
1,3DICHLOROPROPYLENE	542756	No Criteria	68.95	---	---	---	---	---	No RP	No RP
ETHYLBENZENE	100414	2626.56	59.10	---	---	---	---	---	No RP	No RP
BROMOMETHANE (methyl bromide)	74839	No Criteria	4924.80	---	---	---	---	---	No RP	No RP
CHLOROMETHANE (methyl chloride)	74873	No Criteria	0.00	---	---	---	---	---	No RP	No RP

Facility Name: *Cranston WWTF*

RIPDES Permit #: *RI0100013*

Outfall #: *001A*

NOTE: METALS LIMITS ARE TOTAL METALS

Parameter	CAS #	Concentration Limits (ug/L) Based on WQ Criteria		Antideg. Limits (ug/L)	Priority Pollutant Scan Data (ug/l) 2011 - 2015		Ave. DMR Data (ug/L) Dec. 2008 - Apr. 2016		Assigned Permit Limits (ug/L)	
		Daily Max	Monthly Ave	Monthly Ave	Max	Ave	Daily Max	Monthly Ave	Daily Max	Monthly Ave
METHYLENE CHLORIDE	75092	15841.44	351.30	---	---	---	---	---	No RP	No RP
1,1,2,2TETRACHLOROETHANE	79345	764.99	16.42	---	---	---	---	---	No RP	No RP
TETRACHLOROETHYLENE	127184	393.98	8.70	---	---	---	1	1	No RP	No RP
TOLUENE	108883	1042.42	22.98	---	---	---	---	---	No RP	No RP
1,2TRANSDICHLOROETHYLENE	156605	No Criteria	32832.00	---	---	---	---	---	No RP	No RP
1,1,1TRICHLOROETHANE	71556	No Criteria	0.00	---	---	---	---	---	No RP	No RP
1,1,2TRICHLOROETHANE	79005	1477.44	32.83	---	---	---	---	---	No RP	No RP
TRICHLOROETHYLENE	79016	3201.12	70.59	---	---	---	---	---	No RP	No RP
VINYL CHLORIDE	75014	No Criteria	7.88	---	---	---	---	---	No RP	No RP
ACID ORGANIC COMPOUNDS										
2CHLOROPHENOL	95578	211.77	4.76	---	---	---	---	---	No RP	No RP
2,4DICHLOROPHENOL	120832	165.80	3.61	---	---	---	---	---	No RP	No RP
2,4DIMETHYLPHENOL	105679	174.01	3.94	---	---	---	---	---	No RP	No RP
4,6DINITRO2METHYL PHENOL	534521	No Criteria	919.30	---	---	---	---	---	No RP	No RP
2,4DINITROPHENOL	51285	50.8896	1.13	---	---	---	---	---	No RP	No RP
4NITROPHENOL	88755	No Criteria	0.00	---	---	---	---	---	No RP	No RP
PENTACHLOROPHENOL	87865	No Criteria	98.50	---	---	---	---	---	No RP	No RP
PHENOL	108952	412.04	9.19	---	10	1.67	---	---	412.04	9.19
2,4,6TRICHLOROPHENOL	88062	26.2656	0.59	---	---	---	---	---	No RP	No RP
BASE NEUTRAL COMPOUNDS										
ACENAPHTHENE	83329	139.54	3.12	---	---	---	---	---	No RP	No RP
ANTHRACENE	120127	No Criteria	131328.00	---	---	---	---	---	No RP	No RP
BENZIDINE	92875	No Criteria	0.01	---	---	---	---	---	No RP	No RP
PAHs		No Criteria	0.59	---	---	---	---	---	No RP	No RP
BIS(2CHLOROETHYL)ETHER	111444	No Criteria	17.40	---	---	---	---	---	No RP	No RP
BIS(2CHLOROISOPROPYL)ETHER	108601	No Criteria	213408.00	---	---	---	---	---	No RP	No RP
BIS(2ETHYLHEXYL)PHTHALATE	117817	911.09	19.70	---	5.1	1.53	---	---	No RP	No RP
BUTYL BENZYL PHTHALATE	85687	139.54	3.12	---	---	---	---	---	No RP	No RP
2CHLORONAPHTHALENE	91587	No Criteria	3064.32	---	---	---	---	---	No RP	No RP
1,2DICHLOROBENZENE	95501	129.69	2.95	---	---	---	---	---	No RP	No RP
1,3DICHLOROBENZENE	541731	640.22	14.28	---	---	---	---	---	No RP	No RP
1,4DICHLOROBENZENE	106467	91.93	1.97	---	---	---	---	---	No RP	No RP
3,3DICHLOROBENZIDENE	91941	No Criteria	0.92	---	---	---	---	---	No RP	No RP
DIETHYL PHTHALATE	84662	4276.37	95.21	---	---	---	---	---	No RP	No RP
DIMETHYL PHTHALATE	131113	2708.64	60.74	---	---	---	---	---	No RP	No RP

Facility Name: *Cranston WWTF*

RIPDES Permit #: *RI0100013*

Outfall #: *001A*

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Parameter	CAS #	Concentration Limits (ug/L) Based on WQ Criteria		Antideg. Limits (ug/L)	Priority Pollutant Scan Data (ug/l) 2011 - 2015		Ave. DMR Data (ug/L) Dec. 2008 - Apr. 2016		Assigned Permit Limits (ug/L)	
		Daily Max	Monthly Ave	Monthly Ave	Max	Ave	Daily Max	Monthly Ave	Daily Max	Monthly Ave
DI-n-BUTYL PHTHALATE	84742	No Criteria	9824.98	---	---	---	---	---	No RP	No RP
2,4DINITROTOLUENE	121142	2544.48	55.81	---	---	---	---	---	No RP	No RP
1,2DIPHENYLHYDRAZINE	122667	22.98	0.51	---	---	---	---	---	No RP	No RP
FLUORANTHENE	206440	326.68	7.22	---	---	---	---	---	No RP	No RP
FLUORENE	86737	No Criteria	17400.96	---	---	---	---	---	No RP	No RP
HEXACHLOROBENZENE	118741	No Criteria	0.01	---	---	---	---	---	No RP	No RP
HEXACHLOROBUTADIENE	87683	No Criteria	590.98	---	---	---	---	---	No RP	No RP
HEXACHLOROCYCLOPENTADIENE	77474	0.57	0.01	---	---	---	---	---	No RP	No RP
HEXACHLOROETHANE	67721	80.44	1.81	---	---	---	---	---	No RP	No RP
ISOPHORONE	78591	9603.36	213.41	---	---	---	---	---	No RP	No RP
NAPHTHALENE	91203	188.78	4.27	---	---	---	---	---	No RP	No RP
NITROBENZENE	98953	2216.16	49.25	---	---	---	---	---	No RP	No RP
NNITROSODIMETHYLAMINE	62759	No Criteria	98.50	---	---	---	---	---	No RP	No RP
NNITROSODINPROPYLAMINE	621647	No Criteria	16.74	---	---	---	---	---	No RP	No RP
NNITROSODIPHENYLAMINE	86306	480.99	10.67	---	---	---	---	---	No RP	No RP
PYRENE	129000	No Criteria	13132.80	---	---	---	---	---	No RP	No RP
1,2,4trichlorobenzene	120821	123.12	2.79	---	---	---	---	---	No RP	No RP
PESTICIDES/PCBs										
ALDRIN	309002	4.92	0.002	---	---	---	---	---	No RP	No RP
Alpha BHC	319846	No Criteria	0.161	---	---	---	---	---	No RP	No RP
Beta BHC	319857	No Criteria	0.558	---	---	---	---	---	No RP	No RP
Gamma BHC (Lindane)	58899	1.56	5.910	---	---	---	---	---	No RP	No RP
CHLORDANE	57749	3.94	0.007	---	---	---	---	---	No RP	No RP
4,4DDT	50293	1.81	0.002	---	---	---	---	---	No RP	No RP
4,4DDE	72559	No Criteria	0.007	---	---	---	---	---	No RP	No RP
4,4DDD	72548	No Criteria	0.010	---	---	---	---	---	No RP	No RP
DIELDRIN	60571	0.39	0.002	---	---	---	---	---	No RP	No RP
ENDOSULFAN (alpha)	959988	0.36	0.092	---	---	---	---	---	No RP	No RP
ENDOSULFAN (beta)	33213659	0.36	0.092	---	---	---	---	---	No RP	No RP
ENDOSULFAN (sulfate)	1031078	No Criteria	292.204	---	---	---	---	---	No RP	No RP
ENDRIN	72208	0.14	0.059	---	---	---	---	---	No RP	No RP
ENDRIN ALDEHYDE	7421934	No Criteria	0.980	---	---	---	---	---	No RP	No RP
HEPTACHLOR	76448	0.85	0.003	---	---	---	---	---	No RP	No RP
HEPTACHLOR EPOXIDE	1024573	0.85	0.001	---	---	---	---	---	No RP	No RP
POLYCHLORINATED BIPHENYLS3	1336363	No Criteria	0.002	---	---	---	---	---	No RP	No RP

Facility Name: *Cranston WWTF*

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		Daily Max	Monthly Ave	Monthly Ave	Max	Ave	Daily Max	Monthly Ave	Daily Max	Monthly Ave
2,3,7,8TCDD (Dioxin)	1746016	No Criteria	0.000	---	---	---	---	---	No RP	No RP
TOXAPHENE	8001352	1.20	0.000	---	---	---	---	---	No RP	No RP
TRIBUTYLTIN		0.76	0.118	---	---	---	---	---	No RP	No RP
NON PRIORITY POLLUTANTS:										
OTHER SUBSTANCES										
ALUMINUM (limits are total recoverable)	7429905	1233.48	142.82	---	---	---	---	---	1233.48	142.82
AMMONIA (winter)	7664417	72431.00	16154.00	---	---	---	5520	2600	72431.00	16154.00
AMMONIA (summer)		73215.00	6200.00	---	---	---	3100	1280	73215.00	6200.00
4BROMOPHENYL PHENYL ETHER		29.55	0.66	---	---	---	---	---	No RP	No RP
CHLORIDE	16887006	1411776.00	398544.00	---	---	---	---	---	No RP	No RP
CHLORINE	7782505	38.99	22.57	---	---	---	29.33	12.21	38.99	22.57
4CHLORO2METHYLPHENOL		24.62	0.53	---	---	---	---	---	No RP	No RP
1CHLORONAPHTHALENE		131.33	2.95	---	---	---	---	---	No RP	No RP
4CHLOROPHENOL	106489	315.19	7.06	---	---	---	---	---	No RP	No RP
2,4DICHLORO6METHYLPHENOL		36.12	0.79	---	---	---	---	---	No RP	No RP
1,1DICHLOROPROPANE		1887.84	42.68	---	---	---	---	---	No RP	No RP
1,3DICHLOROPROPANE	142289	497.40	11.00	---	---	---	---	---	No RP	No RP
2,3DINITROTOLUENE		27.91	0.61	---	---	---	---	---	No RP	No RP
2,4DINITRO6METHYL PHENOL		19.70	0.43	---	---	---	---	---	No RP	No RP
IRON	7439896	No Criteria	1732.80	---	---	---	---	---	Monitor Only	1732.80
pentachlorobenzene	608935	21.34	0.46	---	---	---	---	---	No RP	No RP
PENTACHLOROETHANE		594.26	13.13	---	---	---	---	---	No RP	No RP
1,2,3,5tetrachlorobenzene		526.95	11.66	---	---	---	---	---	No RP	No RP
1,1,1,2TETRACHLOROETHANE	630206	1608.77	36.12	---	---	---	---	---	No RP	No RP
2,3,4,6TETRACHLOROPHENOL	58902	11.49	0.26	---	---	---	---	---	No RP	No RP
2,3,5,6TETRACHLOROPHENOL		13.95	0.31	---	---	---	---	---	No RP	No RP
2,4,5TRICHLOROPHENOL	95954	37.76	0.84	---	---	---	---	---	No RP	No RP
2,4,6TRINITROPHENOL	88062	6952.18	154.31	---	---	---	---	---	No RP	No RP
XYLENE	1330207	218.33	5.20	---	---	---	---	---	No RP	No RP

* Indicates limits that were developed via PAWTOXIC WQ Model.

"No RP"= The Facility has no reasonable potential to exceed applicable WQ based limits.

PART II
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GENERAL REQUIREMENTS

DEFINITIONS

GENERAL REQUIREMENTS

(a) Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of Chapter 46-12 of the Rhode Island General Laws and the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

(1) The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

(2) The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307 or 308 of the Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment of not more than 1 year, or both.

(3) Chapter 46-12 of the Rhode Island General Laws provides that any person who violates a permit condition is subject to a civil penalty of not more than $5,000 per day of such violation. Any person who willfully or negligently violates a permit condition is subject to a criminal penalty of not more than $10,000 per day of such violation and imprisonment for not more than 30 days, or both. Any person who knowingly makes any false statement in connection with the permit is subject to a criminal penalty of not more than $5,000 for each instance of violation or by imprisonment for not more than 30 days, or both.

(b) Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Director. (The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

(c) Need to Halt or Reduce Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(d) Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(e) Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures, and, where applicable, compliance with DEM "Rules and Regulations Pertaining to the Operation and Maintenance of Wastewater Treatment Facilities" and "Rules and Regulations Pertaining to the Disposal and Utilization of Wastewater Treatment Facility Sludge." This provision requires the operation of back-up or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of the permit.

(f) Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause, including but not limited to: (1) Violation of any terms or conditions of this permit; (2) Obtaining this permit by misrepresentation or failure to disclose all relevant facts; or (3) A change in any conditions that requires either a temporary or permanent reduction or elimination of the authorized discharge. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

(g) Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

(h) Duty to Provide Information

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

(i) Inspection and Entry

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

(2) Have access to and copy, at reasonable times any records that must be kept under the conditions of this permit;

(3) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and

(4) Sample or monitor any substances or parameters at any location, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA or Rhode Island law.

(j) Monitoring and Records

(1) Samples and measurements taken for the purpose of monitoring shall be representative of the volume and nature of the discharge over the sampling and reporting period.

(2) The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings from continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 5 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

(3) Records of monitoring information shall include:

(i) The date, exact place, and time of sampling or measurements;

(ii) The individual(s) who performed the sampling or measurements;

(iii) The date(s) analyses were performed;

(iv) The individual(s) who performed the analyses;

(v) The analytical techniques or methods used; and

(vi) The results of such analyses.

(4) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136 and applicable Rhode Island regulations, unless other test procedures have been specified in this permit.

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall upon conviction, be punished by a fine of not more than $10,000 per violation or by imprisonment for not more than 6 months per violation or by both. Chapter 46-12 of the Rhode Island General Laws also provides that such acts are subject to a fine of not more than $5,000 per violation, or by imprisonment for not more than 30 days per violation, or by both.

(6) Monitoring results must be reported on a Discharge Monitoring Report (DMR).

(7) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR Part 136, applicable State regulations, or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

(k) Signatory Requirement

All applications, reports, or information submitted to the Director shall be signed and certified in accordance with Rule 12 of the Rhode Island Pollutant Discharge Elimination System (RIPDES) Regulations. Rhode Island General Laws, Chapter 46-12 provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $5,000 per violation, or by imprisonment for not more than 30 days per violation, or by both.

(l) Reporting Requirements

(1) Planned changes. The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility.

(2) Anticipated noncompliance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with the permit requirements.

(3) Transfers. This permit is not transferable to any person except after written notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under State and Federal law.

(4) Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(5) Twenty-four hour reporting. The permittee shall immediately report any noncompliance which may endanger health or the environment by calling DEM at (401) 222-4700 or (401) 222-3070 at night.

A written submission shall also be provided within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

The following information must be reported immediately:

(i) Any unanticipated bypass which causes a violation of any effluent limitation in the permit; or

(ii) Any upset which causes a violation of any effluent limitation in the permit; or

(iii) Any violation of a maximum daily discharge limitation for any of the pollutants specifically listed by the Director in the permit.

The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

(6) Other noncompliance. The permittee shall report all instances of noncompliance not reported under paragraphs (1), (2), and (5), of this section, at the time monitoring reports are submitted. The reports shall contain the information required in paragraph (l)(5) of the section.

(7) Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, they shall promptly submit such facts or information.

(m) Bypass

"Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

(1) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (2) and (3) of this section.

(2) Notice.

(i) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten (10) days before the date of the bypass.

(ii) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Rule 14.18 of the RIPDES Regulations.

(3) Prohibition of bypass.

(i) Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:

(A) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage, where "severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production;

(B) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(C) The permittee submitted notices as required under paragraph (2) of this section.

(ii) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph (3)(i) of this section.

(n) Upset

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(1) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph (2) of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(2) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(a) An upset occurred and that the permittee can identify the cause(s) of the upset;

(b) The permitted facility was at the time being properly operated;

(c) The permittee submitted notice of the upset as required in Rule 14.18 of the RIPDES Regulations; and

(d) The permittee complied with any remedial measures required under Rule 14.05 of the RIPDES Regulations.

(3) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

(o) Change in Discharge

All discharges authorized herein shall be consistent with the terms and conditions of this permit. Discharges which cause a violation of water quality standards are prohibited. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, production increases, or process modifications which will result in new, different or increased discharges of pollutants must be reported by submission of a new NPDES application at least 180 days prior to commencement of such discharges, or if such changes will not violate the effluent limitations specified in this permit, by notice, in writing, to the Director of such changes. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by the permit constitutes a violation.

(p) Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner consistent with applicable Federal and State laws and regulations including, but not limited to the CWA and the Federal Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq., Rhode Island General Laws, Chapters 46-12, 23-19.1 and regulations promulgated thereunder.

(q) Power Failures

In order to maintain compliance with the effluent limitation and prohibitions of this permit, the permittee shall either:

> In accordance with the Schedule of Compliance contained in Part I, provide an alternative power source sufficient to operate the wastewater control facilities;

or if such alternative power source is not in existence, and no date for its implementation appears in Part I,

> Halt reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

(r) Availability of Reports

Except for data determined to be confidential under paragraph (w) below, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the DEM, 291 Promenade Street, Providence, Rhode Island. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA and under Section 46-12-14 of the Rhode Island General Laws.

(s) State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law.

(t) Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, nor does it relieve the permittee of its obligation to comply with any other applicable Federal, State, and local laws and regulations.

(u) Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

(v) Reopener Clause

The Director reserves the right to make appropriate revisions to this permit in order to incorporate any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA or State law. In accordance with Rules 15 and 23 of the RIPDES Regulations, if any effluent standard or prohibition, or water quality standard is promulgated under the CWA or under State law which is more stringent than any limitation on the pollutant in the permit, or controls a pollutant not limited in the permit, then the Director may promptly reopen the permit and modify or revoke and reissue the permit to conform to the applicable standard.

(w) Confidentiality of Information

(1) Any information submitted to DEM pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, DEM may make the information available to the pubic without further notice.

(2) Claims of confidentiality for the following information will be denied:

(i) The name and address of any permit applicant or permittee;

(ii) Permit applications, permits and any attachments thereto; and

(iii) NPDES effluent data.

(x) Best Management Practices

The permittee shall adopt Best Management Practices (BMP) to control or abate the discharge of toxic pollutants and hazardous substances associated with or ancillary to the industrial manufacturing or treatment process and the Director may request the submission of a BMP plan where the Director determines that a permittee's practices may contribute significant amounts of such pollutants to waters of the State.

(y) Right of Appeal

Within thirty (30) days of receipt of notice of a final permit decision, the permittee or any interested person may submit a request to the Director for an adjudicatory hearing to reconsider or contest that decision. The request for a hearing must conform to the requirements of Rule 49 of the RIPDES Regulations.

DEFINITIONS

1. For purposes of this permit, those definitions contained in the RIPDES Regulations and the Rhode Island Pretreatment Regulations shall apply.

2. The following abbreviations, when used, are defined below.

cu. M/day or M^3/day	cubic meters per day
mg/l	milligrams per liter
ug/l	micrograms per liter
lbs/day	pounds per day
kg/day	kilograms per day
Temp. °C	temperature in degrees Centigrade
Temp. °F	temperature in degrees Fahrenheit
Turb.	turbidity measured by the Nephelometric Method (NTU)
TNFR or TSS	total nonfilterable residue or total suspended solids
DO	dissolved oxygen
BOD	five-day biochemical oxygen demand unless otherwise specified
TKN	total Kjeldahl nitrogen as nitrogen
Total N	total nitrogen
NH_3-N	ammonia nitrogen as nitrogen
Total P	total phosphorus
COD	chemical oxygen demand
TOC	total organic carbon
Surfactant	surface-active agent
pH	a measure of the hydrogen ion concentration
PCB	polychlorinated biphenyl
CFS	cubic feet per second
MGD	million gallons per day
Oil & Grease	Freon extractable material
Total Coliform	total coliform bacteria
Fecal Coliform	total fecal coliform bacteria
ml/l	milliliter(s) per liter
NO_3-N	nitrate nitrogen as nitrogen
NO_2-N	nitrite nitrogen as nitrogen
NO_3-NO_2	combined nitrate and nitrite nitrogen as nitrogen
$C1_2$	total residual chlorine

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
235 Promenade Street, Providence, Rhode Island 02908

October 1, 2019

CERTIFIED MAIL

Honorable Allan Fung
Mayor of Cranston
City of Cranston
869 Park Avenue
Cranston, RI 02910

RE: Final Permit for Cranston Water Pollution Control Facility
RIPDES Permit No. RI0100013

Dear Mayor Fung:

Enclosed is the final Rhode Island Pollutant Discharge Elimination System (RIPDES) Permit issued for the above-mentioned facility. State regulations, promulgated under Chapter 46-12 of the Rhode Island General Laws of 1956, as amended, require this permit to become effective on the date specified in the permit. Also enclosed is a copy of the Rhode Island Department of Environmental Management's (DEM's) response to the comments received on the draft permit and information relative to hearing requests and stays of RIPDES Permits.

Please note that a requirement has been added to Part I.D. of the permit, requiring your facility to submit an addendum to your Operation and Maintenance plans to specifically address steps you have, and the steps you will take to operate the treatment works as efficiently as possible and reduce effluent nitrogen concentration as low as possible within 90 days of issuance of the permit.

As noted in the Response to Public Comments, the DEM is aware that the facility may not be able to immediately comply with certain limitations/conditions in the new permit. Therefore, the DEM is willing to enter into a Consent Agreement with the City of Cranston that will establish a compliance schedule for the City of Cranston to come into compliance with these requirements. Specifically, the DEM is willing to enter into a Consent Agreement that will include a compliance schedule for the City of Cranston to comply with its Total Selenium limits. In order for the DEM to be able to enter into a Consent Agreement with the City of Cranston, the City of Cranston must file an appeal of the above-mentioned permit requirements.

In order to appeal the permits, the City of Cranston must request an adjudicatory hearing pursuant to RIPDES Regulations 250-RICR-150-10-50 within thirty (30) days. Additionally, to obtain a stay of the contested limits for the duration of the appeal, the City of Cranston must also request a

temporary stay for the duration of the adjudicatory hearing proceedings in accordance with RIPDES Regulations 250-RICR-150-10-51.

We appreciate your cooperation throughout the development of this permit. Should you have any questions concerning this permit, feel free to contact Abdulrahman Ragab of the State Permits Staff at 401-222-4700, extension 7201 or via email at Abed.Ragab@dem.ri.gov.

Sincerely,

Joseph B. Haberek, P.E.
Environmental Engineer IV

JBH:ar

Enclosures

Ecc: Kenneth Mason, P.E., Cranston
Earl Salisbury, Veolia
Steven Brittsan, Pawtuxet River Authority
Michael Jarbeau, Save the Bay
Crystal Charbonneau, DEM/OWR
Angelo Liberti, P.E., DEM/OWR
Bill Patenaude, DEM/OWR
David Turin, EPA
Sandy Mojica, EPA

RESPONSE TO COMMENTS

On December 19, 2018, the Rhode Island Department of Environmental Management (DEM) public noticed its proposed reissuance of Rhode Island Pollutant Discharge Elimination System (RIPDES) Permit numbers RI010013, RI0100234, and RI0100153, which were issued to the Cranston Water Pollution Control Facility, Warwick Wastewater Treatment Facility, and West Warwick Wastewater Treatment Facility (the WWTFs) respectively. The Public Comment Period was from December 19, 2018 through February 1, 2019 with a public hearing held at the DEM's Providence offices on January 31, 2019. In response to this public notice, DEM received comment letters on the proposed draft permits from the City of Cranston, the City of Warwick, the West Warwick WWTF, the Warwick Sewer Authority (WSA), the Pawtuxet River Authority, and Save the Bay. The following is a synopsis of the comments DEM received on the draft permits and DEM's responses to these comments.

Comment 1. WSA commented on the new aluminum (Al) limits stating that WSA will not be able to meet the proposed Al limit. WSA had also previously commented on the 14-draft permit indicating that these new Al limits will require costly changes and/or installation of new technology, and that these limits were not anticipated by WSA or raised by RI DEM following review of 20-year plan and approval of total phosphorous (TP) removal process.

The West Warwick WWTF also commented that complying with the new Al limits will require extensive modifications to treatment process. West Warwick indicated that they can't use ferric coagulating chemicals for TP removal because of their use of ultraviolet (UV) system for disinfection. West Warwick requested review of allocation method and reallocation of Al loads from Hoechst Celanese and Cranston WWTF as they use ferric salt as coagulant.

Response: West Warwick and Warwick WWTFs utilize aluminum sulfate (Alum) as the tertiary treatment ballasted flocculation coagulant for phosphorus removal. Based on the use of Alum in the tertiary treatment process, a limit for total aluminum was developed from the current RI DEM freshwater aquatic life chronic water quality criteria and included in the permits. The RIPDES limitations will ensure that the discharge does not cause an exceedance of the water quality criteria.

As indicated in the recent meetings between RI DEM and the WWTFs, United States Environmental Protection Agency (EPA) recently updated the aquatic life ambient water quality criteria for freshwaters for aluminum. RI DEM expects to make appropriate updates to its water quality regulations based on consideration of EPA's new recommended aluminum criteria. The new Al criteria takes into consideration the receiving water pH, hardness and Dissolved Organic Carbon (DOC) concentration. Using typical background pH, hardness, and DOC concentrations, EPA's updated Al criteria will result in significantly higher Al limits than the limits currently assigned in the permits.

The RI DEM did consider different Al allocation scenarios for the WWTFs discharging to the Pawtuxet River. DEM considered different discharge scenarios including:

- Allocating the Al waste load allocation to West Warwick, Warwick, and Cranston WWTFs using current RI DEM freshwater aquatic life chronic water quality criteria
- Allocating the Al waste load allocation to West Warwick, and Warwick WWTF only using current RI DEM freshwater aquatic life chronic water quality criteria
- Allocating the Al waste load allocation to West Warwick only using current RI DEM freshwater aquatic life chronic water quality criteria

Review of the different scenarios and WWTFs Al effluent data provided by Warwick and West Warwick show that average Al concentration in the WWTFs effluent is in the range of 500 ug/l which is greater than the Al limit in any of the discharge scenarios mentioned above. Therefore, the limits in the final permit were established using the same allocation as other pollutants (i.e., equal allocation among all three WWTFs) to be equitable among all WWTFs.

DEM also calculated what Al limits might be if EPA's new Al criteria was adopted into RI water quality regulations. Based on the following assumptions for the Pawtuxet River; instream hardness of 62.3 mg/L, pH value of 7, and DOC of 6 mg/L, the Al limits will be in the range of 700 – 1,500 ug/L.

DEM is issuing the permits with Al limits based on current RI water quality criteria and subsequent to issuance of the permits the DEM anticipates entering into a Consent Agreement with the permittees that will establish interim limits and a schedule for the permittees to evaluate their ability to meet the final limits and attain compliance with these limits. Under this Consent Agreement DEM expects that the permittees will collect instream data (such as pH, DOC, and hardness) that will be necessary to calculate the new Al criteria and, until new Al limits are assigned, the WWTFs will optimize Al removal under current operational processes. In order for the DEM to enter a consent agreement, the permittee must comment on any new permit conditions/limits that cannot be achieved during the public notice period.

Comment 2. WSA commented on chloroform limits stating that WSA will not be able to meet the new limit for chloroform.

Response: Review of previously submitted Priority Pollutant Scan (PPS) reports and effluent chloroform results from 2010 to 2018 provided by WSA shows that the facility may

have difficulty meeting the chloroform limits. chloroform concentrations from previous PPS reports are summarized in the following table:

DATE	Concentration (ug/L)
8/7/2018	19.0
7/29/2018	46.0
6/20/2018	8.4
5/23/2018	4.0
8/2/2017	24.0
6/14/2017	4.3
12/7/2016	52.0
9/7/2016	42.0

DATE	Concentration (ug/L)
6/29/2016	25.0
4/28/2016	24.0
8/6/2015	70.0
6/22/2015	57.0
7/22/2014	30.0
7/30/2013	11.0
7/24/2012	50.0
7/21/2011	20.0
8/31/2010	17.0

The permit assigned a chloroform monthly average limit of 46 ug/l. Although the average chloroform concentration from 2010 to 2018 in Warwick's effluent is 29.6 ug/L, there have been several monthly samples that exceeded the proposed limit. Therefore, The DEM is willing to enter into a Consent Agreement with Warwick that will establish interim limits and a schedule for the permittee to evaluate its ability to meet the final limits and attain compliance.

Comment 3. The City of Cranston indicated that it may not be able to meet its selenium limits and, therefore, requested a stay of the selenium limit to locate the source of selenium.

Response: Currently Cranston is conducting a study to try and locate the source of high selenium inflow into the WWTF. Cranston has been collecting and analyzing water samples from the WWTF for selenium since June 2017. Based on discussions with Cranston and after review of data provided to DEM by Cranston in which recent data has complied with the limit but historic data had exceedances, it has been determined that Cranston may not be able to regularly and consistently meet selenium limit. Therefore, the DEM is willing to enter into a Consent Agreement with Cranston to develop a compliance schedule to meet selenium limits.

Comment 4. Save the Bay commented on the Total Nitrogen limit and requested RI DEM to reconsider the Total Nitrogen limit for Cranston, Warwick, and West Warwick facilities and impose a limit of 3mg/L from June 1 through October 31. Save the Bay also commented that the Cranston, Warwick, and West Warwick WWTFs are affecting the health of the Providence River and Upper Narragansett Bay and continue to note that further assessment is needed to study the impact of current nitrogen reductions. Save the Bay urged DEM to allocate the necessary resources and prioritize research on the impact of nitrogen reductions on the Bay.

Response: Since 2004 a number of agencies have worked together to establish a network of fixed-site monitoring stations throughout Narragansett Bay to monitor changes in dissolved oxygen and chlorophyll levels. The network is now an essential component of Rhode Island's monitoring strategy for the Bay. The stations were located strategically to transect the length of Narragansett Bay and serve as sentinels of changing conditions. There is a greater concentration of sites in upper Narragansett Bay purposefully located due to the presence of discharges from both wastewater treatment facilities and large tributary rivers. The DEM Office of Water Resources has taken a lead role in coordinating the multi-agency network effort. The cooperating agencies are as follows:

- Rhode Island Department of Environmental Management- Office of Water Resources (RIDEM-OWR)
- Narragansett Bay Commission (NBC)
- Narragansett Bay National Estuarine Research Reserve (NBNERR)
- Narragansett Bay Estuary Program (NBNEP),
- The Northeastern Regional Association of Coastal Ocean Observing Systems (NERACOOS)
- University of Rhode Island, Graduate School of Oceanography (URI-GSO)
- University of Rhode Island, Coastal Institute
- Brown University

Over the past 10 or so years several researchers have been working to develop models to better understand the nutrient dynamics and ecosystem response to the reduction in nitrogen loads to Narragansett Bay. The NOAA Coastal Hypoxia Research Program (CHRP) funded a project entitled "Observations and Modeling of Narragansett Bay Hypoxia and its Response to Nutrient Management." This CHRP funded research included hydrodynamic modeling using the Regional Ocean Modeling System (ROMS) by Ulman et al. (2019) and two-dimensional ecosystem box models were developed by Dr. Jamie Vaudry (using exchanges rates from ROMS) and Dr. Mark Brush (using the Officer box modeling approach to derive exchange rates). While multiple journal articles were produced from the CHRP funded project, final ecosystem modeling reports are in the works. In addition, the EPA Narragansett Atlantic Ecology Division (Ed Dettmann and associates) has been developing a three dimensional linked hydrodynamic and water quality model for the Bay. EPA is currently working to finalize the draft report.

The Narragansett Bay Commission (NBC) has been contributing toward Dr. Chris Kincaid's work to collect hydrodynamic data and calibrate a ROMS model for Narragansett Bay. Most recently, NBC is also supporting the inclusion of a biological-oxygen model to the ROMS model and adding the Seekonk River to the model system.

Since 2012 nitrogen loadings to Narragansett Bay have been reduced approximately 50%. Oczkowski et al. (2018) evaluated annual, seasonal and regional changes in DIN and Secchi depth from the early 1970s through the 2016 and reported only a few subtle differences. In addition, Oczkowski et al. (2018) also concluded that: "it is too soon to fully assess the legacy effects of more than a century of heavy nutrient fertilization on the ecosystem".

Upon receipt of the final modeling reports, DEM expects the model(s) will provide insight into the final time required for the ecosystem to respond to the nitrogen and phosphorus reductions implemented to date and serve as the foundation for predicting the water quality changes that would be achieved by additional nitrogen reduction strategies and for implementing appropriate strategies. We anticipate final model reports from the EPA AED and Dr. Mark Brush by the end of the year or early next year.

In the interim, DEM is taking additional steps to address the nitrogen loadings from Cranston, West Warwick and Warwick (the facilities with the highest nitrogen limits of those required to reduce nitrogen to improve water quality and reduce ecosystem impacts in the Providence River, Seekonk River and Upper Bay). Section 1.14.F of the RIPDES Regulations (250-RICR-150-10-1) requires that: "The permittee shall at all times maintain in good working order and **operate as efficiently as possible all treatment works**, facilities and systems of treatment and control (and related appurtenances) for collection and treatment which are installed or used by the permittee for water pollution control and abatement to achieve compliance with the terms and conditions of the permit." Section 4.5 of 250-RICR-150-10-1 also requires that "At all times, Wastewater Treatment Facilities shall be maintained in good working order and operated **as efficiently as possible**." RIDEM has revised the permits to require that within 90 days, each WWTF submit an addendum to their Operation and Maintenance plans to specifically address steps they have, and the steps they will take to operate the treatment works as efficiently as possible and reduce effluent nitrogen concentrations as low as possible.

Comment 5. Pawtuxet River Authority commented on the volume of water the Providence Water Supply Board releases to Pawtuxet River. Pawtuxet River Authority requested DEM stays the permits until there is a discussion for fair allocation of loadings and dilution on the Pawtuxet River.

Response: The RI Water Quality Regulations (250-RICR-150-05) Part 1.26 describes the flows used to determine compliance with the aquatic life criteria and permit limits, specifying that the design flow to be utilized for aquatic life criteria shall not be exceeded at or above the lowest average seven (7) consecutive day low flow with an average recurrence frequency of once in ten (10) years (7Q10). Although the volume of water release to the Pawtuxet River might affect the 7Q10 flow, the RIPDES permitting program does not regulate the volume of water released to the

Pawtuxet River by the Providence Water Supply Board. Therefore, RIPDES permit are developed using the current 7Q10 flows.

Comment 6. The City of Warwick commented on new metals limit (aluminum limits) and costs.

Response: See response to Comment 1.

Comment 7. The City of Warwick also commented on the permit term stating that in order to help treatment facilities with long term planning, facility service life, and debt repayment, longer term permits of at least 10-20 years would be more appropriate.

Response: Regulations for the Rhode Island Pollutant Discharge Elimination System (RI Code of Regulations; 250-RICR-150-10-1.20 Duration of Permit) states that a permit shall be effective for a fixed term not to exceed the duration specified in 40 C.F.R. § 122.46. 40 CFR 122.46(a) states that: NPDES permits shall be effective for a fixed term not to exceed 5 years. Therefore, RIPDES permits issued by DEM have a maximum term of five years.

HEARING REQUESTS

If you wish to contest any of the provisions of this permit, you must request a formal hearing within thirty (30) days of receipt of this letter. The request should be submitted to the Administrative Adjudication Division at the following address:

Mary Dalton, Clerk
Department of Environmental Management
Office of Administrative Adjudication
235 Promenade Street
3rd Floor, Rm 350
Providence, RI 02908

Any request for a formal hearing must conform to the requirements of §1.50 of the Regulations for the Rhode Island Pollutant Discharge Elimination System (RI Code of Regulations; 250-RICR-150-10-1.50).

STAYS OF RIPDES PERMITS

Should the Department receive and grant a request for a formal hearing, the contested conditions of the permit will not automatically be stayed. However, the permittee, in accordance with §1.51 of the Regulations for the Rhode Island Pollutant Discharge Elimination System (RI Code of Regulations; 250-RICR-150-10-1.51), may request a temporary stay for the duration of adjudicatory hearing proceedings. Requests for stays of permit conditions should be submitted to the Office of Water Resources at the following address:

Angelo S. Liberti, P.E.

Administrator of Surface Water Protection
Office of Water Resources
235 Promenade Street
Providence, Rhode Island 02908

All uncontested conditions of the permit will be effective and enforceable in accordance with the provisions of §1.50 of the Regulations for the Rhode Island Pollutant Discharge Elimination System (RI Code of Regulations; 250-RICR-150-10-1.50).