

MODIFICATION

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, RIPDES Permit No. RI0100315 issued to the Narragansett Bay Commission on December 31, 2001 shall be modified as follows:

The Total Nitrogen, Total Nitrite, Total Nitrate, and TKN limits and monitoring requirements in Part I.A.3 of the permit shall be deleted in their entirety and replaced with the limits and monitoring requirements in Attachment A of this modification.

The remaining effluent limitations, monitoring requirements and other conditions in the original permit are unchanged and in effect.

This modification shall become effective on August 1, 2005.

This permit and the authorization to discharge expire at midnight, February 1, 2007.

This change modifies the permit issued on December 31, 2001.

This modification consists of two (2) pages.

Signed this 27th day of June 2005.

/S/SIGNATURE ON FILE

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

ATTACHMENT A

PART 1

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 (Secondary Treatment Discharge).

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

Effluent Characteristic	Discharge Limitations Quantity - lbs./day		Monitoring Requirement Concentration - specify units			Measurement Frequency	Sample Type
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily		
Nitrogen, Total [TKN + Nitrite + Nitrate, as N] (May – Oct)	2711 lb/d		5.0 mg/L		--- mg/L	3/ Week	Calculated
	(Nov – April)	--- lb/d ¹	--- mg/L ¹		--- mg/L	3/ Week	Calculated
TKN (May – Oct)			--- mg/L		--- mg/L	3/ Week	24-Hr. Comp.
			--- mg/L		--- mg/L	3/ Week	24-Hr. Comp.
Nitrite, Total [as N] (May – Oct)			--- mg/L		--- mg/L	3/ Week	24-Hr. Comp.
			--- mg/L		--- mg/L	3/ Week	24-Hr. Comp.
Nitrate, Total [as N] (May – Oct)			--- mg/L		--- mg/L	3/ Week	24-Hr. Comp.
			--- mg/L		--- mg/L	3/ Week	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 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.

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

FACT SHEET

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

RIPDES PERMIT NO. RI0100315

NAME AND ADDRESS OF APPLICANT:

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

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

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

RECEIVING WATER: Providence, Seekonk, Moshassuck, West, and Woonasquatucket Rivers

CLASSIFICATION: SB1{a}; B1{a} & B{a}

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

The Rhode Island Department of Environmental Management proposes to issue a modification to the above-mentioned facility's RIPDES Permit to discharge into the designated receiving water. The facility is engaged in the treatment of domestic and industrial sewage. The discharge is from the Field's Point Wastewater Treatment Facility's outfall.

II. Limitations and Conditions

The effluent limitations, monitoring requirements, and any implementation schedule (if required) may be found in the permit. The DEM anticipates entering into an enforceable compliance schedule, either by modifying the existing consent agreement or entering into a new consent agreement, to allow the facility to construct the necessary improvements to comply with the Total Nitrogen limits contained in this permit modification.

III. Permit Basis and Explanation of Effluent Limitation Derivation

The Narragansett Bay Commission owns and operates the Field's Point Wastewater Treatment Facility (WWTF) located on Ernest Street in Providence, Rhode Island and several associated Combined Sewer Overflows (CSOs). The discharge from the WWTF to the Providence River consists of treated sanitary sewage and commercial and industrial wastewater. Treatment consists of Screening, Grit Removal, Pre-aeration, Primary Settling, Activated Sludge, Secondary Settling, Chlorination, and Dechlorination.

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

DEM hired a consultant and has been working with a technical advisory committee (TAC), consisting primarily of scientists and engineers representing, academic, municipal, state and federal organizations, to calibrate a model and develop a water quality restoration plan, or TMDL. It was recently concluded that the hydrodynamic model formulation could not adequately simulate conditions due to the relatively severe changes in the bathymetry in the Providence River. In spite of this obstacle DEM believes that nutrient reductions must be established for most facilities in the state. 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 and forwarded to the TAC 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 would not fully comply with existing water quality standards (minimum of 5.0 mg/l "except as naturally occurs") and may not meet Environmental Protection Agency (EPA) guidelines established in October 2000, (*Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras* EPA-822-R-00-012). The EPA's guidelines allow instantaneous values below 4.8 provided the cumulative exposure to low DO levels do not exceed the duration criteria established to ensure that the cumulative percentage of larvae affected shall not exceed a 5% reduction in larval recruitment over the recruitment season.

While DEM believes that the MERL results provide an adequate representation of the relationship between nitrogen and oxygen levels in the Providence and Seekonk Rivers, some uncertainty remains regarding predicted water quality improvements and loading reduction necessary to meet water quality standards. For example, significantly lower mean Dissolved Inorganic Nitrogen (DIN) concentrations were observed in the Providence and Seekonk Rivers as compared to the MERL experiment for an equivalent loading rate, which may be the result of large differences between the field and experimental flushing times. Also the MERL experiment DO sampling protocol does not provide sufficient data to fully assess compliance with the recently established EPA guidelines. However, it is clear that the Providence and Seekonk Rivers are impacted by low DO levels and high phytoplankton levels related to excessive WWTF nitrogen loadings. For these reasons, an evaluation of phased implementation is indicated. Implementation of a phased approach is consistent with the EPA publication titled "Guidance for Water Quality Based Decisions: The TMDL Process", which states: "For Certain non-traditional, problems, if there are not adequate data and predictive tools to characterize and analyze the pollution problem, a phased approach may be necessary". For the reasons noted above, DEM has evaluated implementation costs, analysis of the performance of available technology, and estimates of water quality improvement to developed a phased plan for implementation of WWTF improvements which maximizes the DO levels relative to implementation cost.

Nine (9) different cases, representing various combinations of nitrogen reduction at three (3) Massachusetts and seven (7) Rhode Island WWTFs were examined. The WWTFs included in this analysis were: the Upper Blackstone Water Pollution Abatement District ("UBWPAD") located in Worcester, MA, the North Attleboro WWTF, the Attleboro WWTF, the Woonsocket WWTF, the Bucklin Point WWTF, the Fields Point WWTF, the East Providence Water Pollution Control Facility, the Cranston Water Control Facility, the West Warwick WWTF, and the Warwick WWTF. 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. This analysis

has been added to the document "Evaluation of Nitrogen Targets and WWTF Load Reductions for the Providence and Seekonk Rivers", which is available upon request. Based on this evaluation of the sources of excessive nitrogen levels in the rivers and the capabilities of existing treatment processes, the DEM has determined that it would be appropriate to establish seasonal (May – October) WWTF total nitrogen limits that range from 5.0 mg/l to 8.0 mg/l. These limits 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 5.0 mg/l, this permit modification also requires that the permittee operate the treatment facility to reduce the discharge of total nitrogen, during the months of November through April, to the maximum extent possible using all available treatment equipment in place at the facility. Assigning seasonal total nitrogen limits and requiring that the WWTF be operated year round in a manner to reduce the discharge of nitrogen to the maximum extent possible will result in substantial progress towards the mitigation of hypoxic/anoxic events and meeting water quality standards. The analysis contained in "Evaluation of Nitrogen Targets and WWTF Load Reductions for the Providence and Seekonk Rivers", indicates that the contribution of Massachusetts WWTFs is significant and DEM will be working with the Massachusetts Department of Environmental Protection and the EPA to pursue appropriate nitrogen reductions.

An integral component of this phased implementation approach is monitoring and assessment of water quality changes to determine if additional reductions are necessary to meet applicable standards. DEM, in partnership with NERRS, the Narragansett Bay Commission, University of Rhode Island and Roger Williams University increased the number of Narragansett Bay continuous water quality monitoring stations from 7 to 9 in the summer of 2004. DEM has obtained funding from the federal Bay Window grant to increase the number of stations to at least 13 by the summer of 2005. This monitoring network will provide the data necessary to evaluate compliance with water quality standards, particularly temporal detail needed to evaluate compliance with EPA's DO guidelines.

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 (RIPDES Regulations), both filed pursuant to 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).

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.

IV. 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. Any person may also present oral comments on the draft permit at the scheduled public hearing. In reaching a final decision on the draft permit the Director will respond to all significant comments, either received in writing during the public comment period or presented orally at the public hearing, and make these responses available to the public at DEM's Providence Office. Following the close of the comment period, and after the 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, presented 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.

V. **DEM Contact**

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

Joseph B. Haberek, P.E.
RIPDES Program
Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02908
Telephone: (401) 222-4700, Extension: 7715

Date

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

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