IV.2.3.6 Ethanol and Alkalinity Systems

Two new chemical feed systems will be required for supporting the nitrification and denitrification process. One system would supply supplemental carbon (methanol or ethanol) and the other would supply alkalinity (sodium hydroxide, for example). The chemical storage tanks and feed system would be located at the site of the recently demolished sludge filter building.

IV.2.3.7 Other Support Processes

The other aeration support processes include the return sludge system, waste sludge, and aeration tank dewatering systems. These systems are expected to remain unchanged when the aeration tanks are converted to the BNR reactors.

The existing return sludge system consists of six 13 mgd return sludge pumps. The system is capable of returning 100% of average daily flow, or 65 mgd, and will be adequate for the IFAS system. The existing return sludge flow control valves will be replaced with new valves.

There are two existing waste activated sludge pumps rated at 1700 gallons per minute, and three existing aeration tank dewatering pumps rated at 500 gallons per minute. These pumps would be adequate for the IFAS system.

IV.2.3.8 Other Improvements

Dissolved oxygen in wastewater delivered to the anoxic zone of the BNR reactors should be as low as possible in order to minimize the anoxic zone volume required. Three process areas in the treatment facility were identified sources of entrained air: the grit channel effluent weir, the primary clarifier effluent channels, and the screw lift pumps. During the design phase, means of reducing air entrainment at the grit effluent and primary clarifier effluent will be developed. The screw lift pumps at the intermediate pump station will be replaced with axial or centrifugal pumps which have less of a tendency to entrain air in the wastewater.

IV.2.4 Cost Summary

Table IV.2.4-1 presents a present worth cost summary for the floating media IFAS system. The costs are based on an ENR index of 7600.

The cost estimate presented is based on the following arrangement for the BNR reactor influent pumps; other arrangements will be evaluated during preliminary design:

The screw pumps would be replaced with centrifugal or propeller type pumps. This would free up the screw pump motor room as a location to install the new aeration blowers. The existing screw pump troughs would be demolished and a new electrical building constructed in their place. In this building would be housed the variable speed drives for the new pumps and the motor control equipment for the new fine screens and new blowers. No additional motor control equipment would be needed for the new pumps because the screw pump motor control equipment would be used.

Table IV.2.4-1: Present Worth Costs for IFAS Floating Media System

Item	Capital Cost	Annual O&M Cost	
Replace Screw Pumps with new BNR Reactor Influent Pumps	$620,000		
Fine Screens	$540,000		
Additional Air Blowers	$1,075,000		
BNR Reactor Influent Control Valves	$480,000		
Return Sludge Control Valves	$320,000		
FPWWTF Computer Upgrade	$1,180,000		
Instrumentation	$650,000		
Electrical	$960,000		
New Air Piping	$845,000		
BNR Reactor Influent Piping	$135,000		
Demolish Screw Pump Troughs	$275,000		
Ethanol/Alkalinity Building	$1,000,000		
Electrical Building for New Screen and Blower Electrical Equipment and for new Intermediate Pump VFD's	$160,000		
Contingency	$2,300,000		
Proprietary IFAS Media and Equipment	$10,960,000		
Proprietary IFAS Equipment Installation and Aeration Tank Modifications	$6,500,000		
Electrical Power		$981,000	
Chemicals (Ethanol, Alkalinity)		$784,000	
Totals	$28,000,000	$1,765,000	
Present Worth Cost	$28,000,000	$21,757,000	
Total Present Worth of Capital and O&M Cost	$49,757,000		

IV.2.5 Construction Sequencing

Because the IFAS process requires more influent lift than the existing screw lift pumps can provide, the screw lift pumps must be replaced before the aeration tanks can be converted to the IFAS process. Additionally, it would be prudent to install the new air blowers before the aeration tanks are converted to BNR reactors to assure adequate air is available for the IFAS process.

Each screw lift pump can be isolated from the flow such that a new pump can be installed while the other pumps are in service. Once a new pump is installed, it can be put into service and another screw pump replaced. A temporary location for the new pumps' variable speed drives would be required until the new electrical building is constructed.

After all the new pumps are installed and operational, the screw pump troughs could be demolished and the new electrical building constructed in their place. The variable speed drives could then be permanently installed in the new building.

Installation of the new air blowers in the screw pump motor room would follow replacement of the screw pumps. The blower electrical equipment would then be installed in the new electrical building and new air piping installed to connect the new blowers to the aeration tank air supply system.

After the new lift pumps and air blowers are operational, the aeration tanks could be converted to the BNR reactors. Construction sequencing for these reactors would be simple and should not require a plant shut-down. An aeration tank could be taken out of service simply by closing its influent sluice gates and shutting off the return sludge and aeration air flows. A temporary bulkhead would then be installed on the channel side of the sluice gate opening to allow removal of the sluice gate.

Using the existing tank dewatering system, the tank contents would be pumped into the aeration tank influent channel. With the tank thus isolated, the modifications required for the IFAS process would be implemented and the IFAS equipment would be installed and tested. The existing sluice gates would then be removed and the new flow control valves and flowmeters would be installed. Finally, the tank would be charged with the IFAS media and placed back into service. The remaining aeration tanks would be similarly converted to BNR reactors.

IV.2.6 Reliability

Although the floating IFAS process is the selected alternative, it may not achieve the 5 mg/L TN monthly average effluent limit consistently during periods of lower wastewater temperatures or weaker wastewater strength. In May, when wastewater temperatures tend to be colder, or during storm events when wastewater is diluted with stormwater, nitrogen removals could fall short and monthly average effluent nitrogen concentrations could be higher than the 5 mg/L TN limit.

IV.2.7 Modifications for Further Treatment

Within eighteen months of initiation of operation, the NBC will submit a draft engineering analysis that will: evaluate whether the WWTF is able to attain compliance with the Total Nitrogen limitations; evaluate and recommend any operational changes that are necessary to attain compliance; or include a determination that facility modifications are necessary to attain compliance. If additional facilities are required to meet the TN effluent limit, the NBC will submit a Facility Plan Amendment within twelve months of DEM's approval of the engineering analysis that will evaluate and recommend facility modifications to attain compliance.

IV.2.8 Project Schedule

A Public Hearing will be scheduled within 30 days following acceptance by RIDEM of the draft Facility Plan Amendment. The public comment period will be open for 30 days following the hearing. The NBC will respond to comments received within 40 business days of the close of the comment period. The Final Facility Plan Amendment will be submitted to RIDEM within 15 business days following the response to comments. Design of the BNR facilities will commence upon RIDEM approval of the Final Facility Plan Amendment. An application for an order of approval (OOA) will be submitted to RIDEM within 18 months following approval of the Final Facility Plan Amendment.

Example of schedule:
Assume Day 1 = Acceptance of Draft Facility Plan by RIDEM

Schedule Public Hearing	Month 1
Public Comment Period Ends	Month 3
Final Facility Plan Amendment to DEM	Month 5.5
(Allow two weeks for DEM review)	
Approval of Final Facility Plan	Month 6
Submit OOA Application	Month 24

V ENVIRONMENTAL ASSESSMENT

V.1 Introduction

The environmental assessment (EA) presented in this section serves to fulfill the requirements of the Rules and Regulations for the State Revolving Loan Fund (SRF) Program, as set forth by the Rhode Island Department of Environmental Management (RIDEM). This EA will briefly provide sufficient evidence and analysis of the impacts and effects that the proposed project will have on the environment in the vicinity of the work, so that RIDEM may determine the appropriate ruling on the necessity for further environmental review.

The EA serves as the basis from which RIDEM can determine whether to issue a Finding of No Significant Impact (FONSI), or require that further environmental review should be undertaken in the Environmental Impact Statement (EIS). This section of the Facility Plan Amendment Report will document compliance with the state and federal review requirements if no EIS is required.

V.2 Project Description and Location

This EA is for the Narragansett Bay Commission's (NBC) Biological Nitrogen Removal Project (BNR) (Project No. 01-109.01P). The mailing address for contacting the Narragansett Bay Commission on any matter concerning the BNR project is given below:

Narragansett Bay Commission
1 Service Road
Providence, RI 02905
ATTN: Theresa Cote
Project Manager

The project site for BNR is the existing aeration tanks and screw lift pumping station at the Field's Point Wastewater Treatment Facility in Providence, RI. All proposed work for this project will take place within the boundaries of the Field's Point Wastewater Treatment Facility property. Figure V.2-1 shows the location of the project.

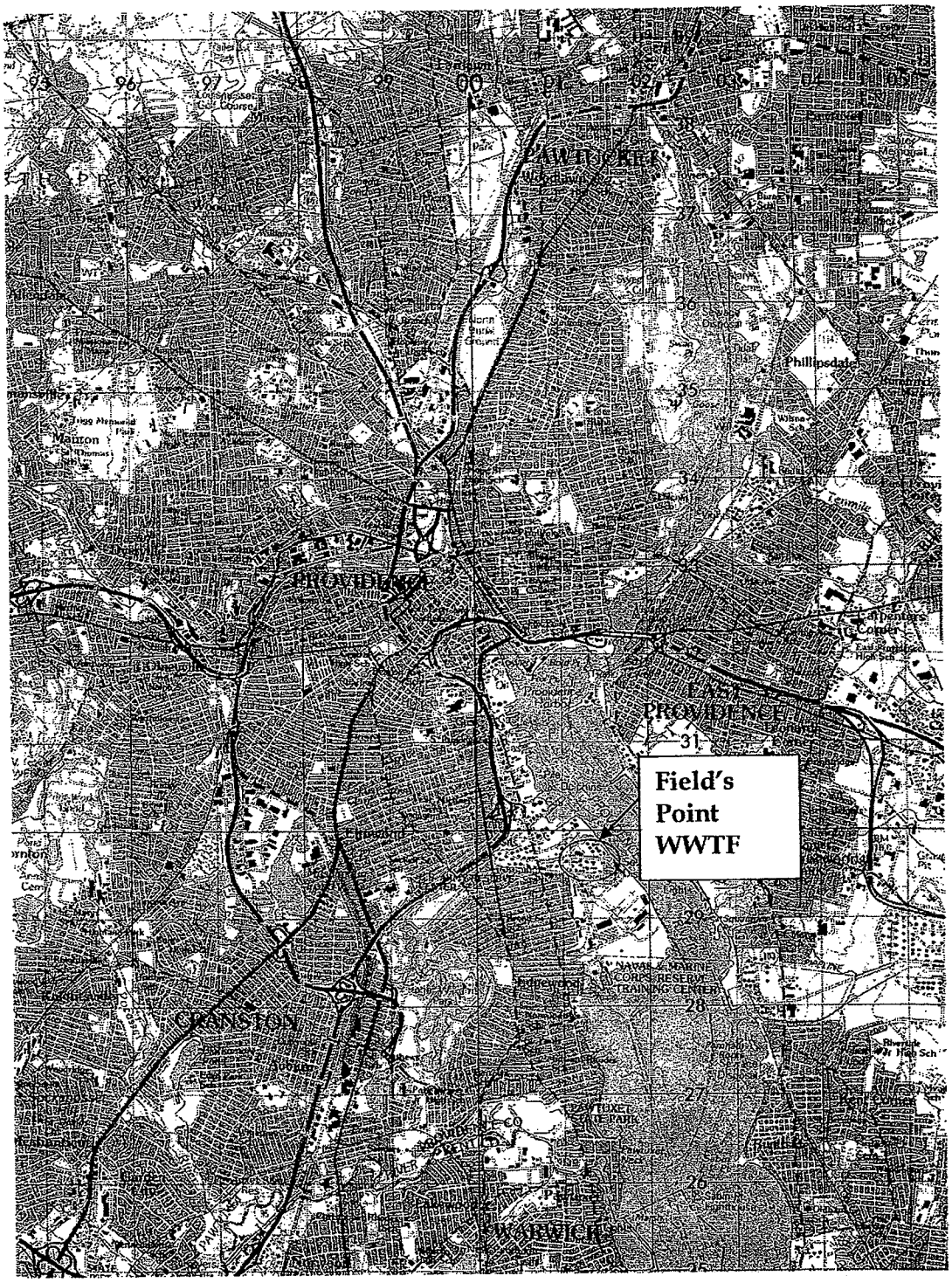

FIGURE V.2-1: PROJECT LOCUS MAP

V.3 Project Purpose and Need

The purpose of the project is to remove nitrogen from the wastewater influent of the FPWWTF. The need for the project is derived from the FPWWTF's RIPDES permit, which requires that the FPWWTF produce an effluent that averages 5 mg/L TN on a monthly basis between May 1 and October 31.

V.4 Previous Environmental Assessments

An "Environmental Impact Assessment" report was included in the Step 1 Facilities Plan for sewerage improvements prepared for the City of Providence in 1979. After review of this report, the EPA issued a "Finding of No Significant Impact " (FONSI) in an environmental assessment dated March 4, 1980. The FONSI stated that the wastewater treatment facilities for Field's Point as recommended in the 1979 facilities plan would not cause significant adverse impacts on the environment in the vicinity of the project. The BNR project proposed in this report is not expected to affect the significance of environmental impacts already addressed in the Environmental Impact Assessment of 1979.

An "Environmental Impact Document" was included in the Facilities Plan Update for Field's Point Wastewater Treatment Facilities prepared for the Narragansett Bay Commission in 1985. After review of this document, the EPA issued a "Finding of No Significant Impact" in an environmental assessment dated April 9, 1986. The FONSI stated that the further improvements for the Field's Point facility and Ernest Street Pumping Station recommended in the 1985 facilities plan update would not have a significant impact on the environment in the vicinity of the proposed work.

Two successive environmental assessments, as described above have received a FONSI for work in the immediate vicinity of the site of the proposed BNR project. These findings establish a background perspective for assessing the environmental impacts of the BNR project and should be considered as part of this environmental assessment. Both of the FONSIs were issued for improvement projects, which were considerably more complex and with far greater potential for environmental impacts than the BNR project proposed in this report.

The environmental concerns, and their resolutions, cited in the 1979 and 1985 environmental impact documents regarding the construction of improvements at Field's Point can be considered as applicable to this BNR project.

V.5 Existing Conditions

The project site for the proposed BNR improvements is located in a highly industrialized area. Examples of the type of industry in the area include shipping, scrap metal, and petroleum storage and distribution. Traffic in the area includes a significant amount of heavy trucking. Noise levels and air quality are characteristic of an urban industrial area.

The project site itself, the FPWWTF, is highly developed. The site contains no woodlands, no wetlands, no natural habitats, natural waterways or other areas of environmental sensitivity. Site development occurred in the 1980's and 1990's with construction of new grit facilities, clarifiers, aeration facilities, disinfection facilities, and a maintenance/storage building.

V.6 Summary of Potential Environmental Impacts

The environmental issues associated with the BNR project are summarized below:

Potential Issue	Proposed Mitigation Action
1. Adverse water quality impacts from unavoidable bypassing of wastewater during certain construction phasing.	1a. Schedule bypassing during low-flow periods. 1b. Use Allen's Avenue sewer for in-line storage during construction phasing. 1c. Use on-site tankage to store flow during necessary plant shut downs; the stormwater primary clarifiers and empty aeration tanks can be used. 1d. Minimize duration of bypassing through efficient scheduling of construction activities.
2. Adverse air and water quality impacts during construction.	2a. Employ appropriate erosion, siltation and dust control methods.
3. Excavation of petroleum contaminated material during construction.	3a. Obtain applicable permits for disposal of material, prior to construction. Consult with RIDEM.

V.7 Future Environment Without the Project

If the BNR facilities are not constructed, it is expected that the environmental conditions of the project site would not change in any way. Since the project is a treatment oriented project, however, and the current level of treatment at the FPWWTF would be expected to remain the same, the occurrence of low dissolved oxygen in Narragansett Bay related to nitrogen discharges from the FPWWTF would continue to be an issue.

V.8 Future Environment with the Project

Overall, the proposed BNR facilities will have a positive impact on the environment. The new facilities will provide nitrogen removal during the warmer months, thus reducing problematic algal growth and low dissolved oxygen occurrences in the receiving water. Reduced nitrogen input into the Providence River and Narragansett Bay from the treatment plant would result in improved water quality for the river and the bay.

The following sections discuss specific environmental impacts of the proposed new BNR facilities as they compare to the existing conditions at the site.

V.9 Socio-Economic Effects

Construction of the new BNR facilities would provide employment for workers in the construction trades and related industries for a period of approximately two years. Local businesses would likely benefit from servicing the construction personnel during the construction period. It is expected that the local suppliers would benefit by furnishing construction materials to the Contractor.

Disruption of local businesses and residences would likely be minimal, if any, during construction of the BNR facilities. There are no residences within the vicinity of the project site. The Washington Park residential area is near the site, but it is easily accessed through alternative routes and residents should not experience any inconvenience while the construction is in progress. Local industries may possibly experience temporary minor inconvenience with construction traffic on New York Avenue, Terminal Road, Service Road, or Ernest Street but, since these roads are designed to accommodate heavy truck traffic, and there is considerable roadway width in each, any inconvenience to local businesses is not expected to hinder business practices.