Water Pollution Control Facility
Department of Public Works
Fairhaven, Massachusetts

Wastewater Management Plan
DRAFT

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Table of Contents

1.0 INTRODUCTION 1
2.0 BACKGROUND 1
2.1 Wastewater Collection System 1
2.2 Water Pollution Control Facility 2
3.0 DEVELOPMENT OF WASTEWATER FLOW PROJECTIONS 4
3.1 Population 4
3.2 Wastewater Flow Based on Water Usage 5
3.3 Wastewater Flow Based on WPCF Flow Data 5
3.4 Town of Mattapoisett Wastewater Flow 5
3.5 Wastewater Flow Projections 5
4.0 TOWN-WIDE SEWER PLAN UPDATE 6
5.0 WASTEWATER TREATMENT CAPACITY AND PROCESS ASSESSMENT 7
5.1 WPCF Capacity 7
5.2 Nitrogen Reduction 8
5.2.1 Existing Nitrogen Reduction 8
5.2.2 Potential Process Modifications for Nitrogen Reduction 9
5.2.3 Comparison of Nitrogen Reduction Technologies 11
5.3 Aeration Tank Improvements 12
6.0 WPCF CONDITIONS SURVEY UPDATE 12
7.0 INFILTRATION/INFLOW IMPACTS ASSESSMENT 13
8.0 COLLECTION SYSTEM & PUMP STATION CONDITIONS ASSESSMENT 14
8.1 Pine Grove Pumping Station 15
8.2 Shannon Meadows Pumping Station 15
8.3 Taber Street Pumping Station 16
8.4 South Street Pumping Station 17
8.5 Storm Flooding at Remote Pumping Stations 17
9.0 RECOMMENDED ACTION PLAN 17

List of Figures

Figure 1. Fairhaven WPCF Flow Diagram 3

List of Tables

Table 1. Population Data – Town of Fairhaven 4
Table 2. Wastewater Flow Projections for Year 2025 (MGD) 6
Table 3. Draft NPDES Permit 7
Table 4. Nitrogen Reduction during 2004 Study 8
Table 5. 2012 Wastewater Characteristics 9
Table 6. Comparison of Available Nitrogen Reduction Technologies 11
Table 7. Advantages & Disadvantages of Available Nitrogen Reduction Technologies 11

Appendices

Appendix A – Wastewater Collection System Maps
Appendix B – Draft NPDES Permit 2010
Appendix C – NPDES Permit 2003
Appendix D – Fairhaven WPCF Hydraulic Profile
Appendix E – WPCF Conditions Survey Database

1.0 INTRODUCTION

This Wastewater Management Plan assesses the overall capacity and condition of the Town of Fairhaven's wastewater collection and main water pollution control facility (WPCF) located on Arsene Street in Fairhaven, MA. The goals of the plan are to provide the town with a document that will assist with:

- Improved database management of its wastewater collection system.
- Compliance with current and anticipated National Pollutant Discharge Elimination System (NPDES) Permit conditions.
- Determining capacity needs in the wastewater collection and treatment system to handle future growth or sewer system extensions over the next 10 years.
- Optimizing wastewater treatment processes and operations.
- Prioritizing rehabilitation and/or upgrades and improvements, and managing the associated financing.

To accomplish these goals, the Wastewater Management Plan will undertake the following tasks:

- Develop Wastewater Flow Projections (through the year 2025)
- Update Town-wide Sewer Plan in Geographic Information Systems (GIS) Format
- Evaluate Wastewater Treatment Capacity and Processes
- Complete WPCF Conditions Survey Update
- Update and Assess Infiltration/Inflow Impacts
- Evaluate Collection System/Pump Station Conditions

This Wastewater Management Plan document presents the results of the above tasks.

There is a second WPCF and tributary collection system in an area of town known as West Island. This plan does not cover these facilities, other than in the discussion of the overall sewer system below, and in the update of the town-wide sewer plan in GIS format.

2.0 BACKGROUND

2.1 Wastewater Collection System

The Town of Fairhaven's sewer system tributary to the main WPCF on Arsene Street consists of approximately 80 miles of gravity and pressure sewers. Based on information from the Fairhaven GIS database, the wastewater collection system for the entire town includes the following:

- 6.6 miles of force mains ranging in size from less than 2 to 24 inches
- 2.4 miles of low pressure sewer ranging in size from less than 1 1/4 to 2 inches
- 72 miles of gravity sewers ranging in size from 4 to 36 inches
- Seven major dry pit/wet pit pumping stations
- Nine submersible type pumping stations
- One suction lift style pumping station

Two main pumping stations handle the entire wastewater flow tributary to the WPCF on Arsene Street. The South Street Pumping Station collects the wastewater from the older section of Fairhaven, and the Railroad Avenue Pumping Station (Main Pumping Station) handles all of the wastewater from the newer sections of the system. Several grinder-type pumping stations serve localized low-pressure sewer systems. The neighboring Town of Mattapoisett also contributes wastewater flow to the Fairhaven system via a 24-inch interceptor tributary to the Railroad Avenue Pumping Station.

2.2 Water Pollution Control Facility

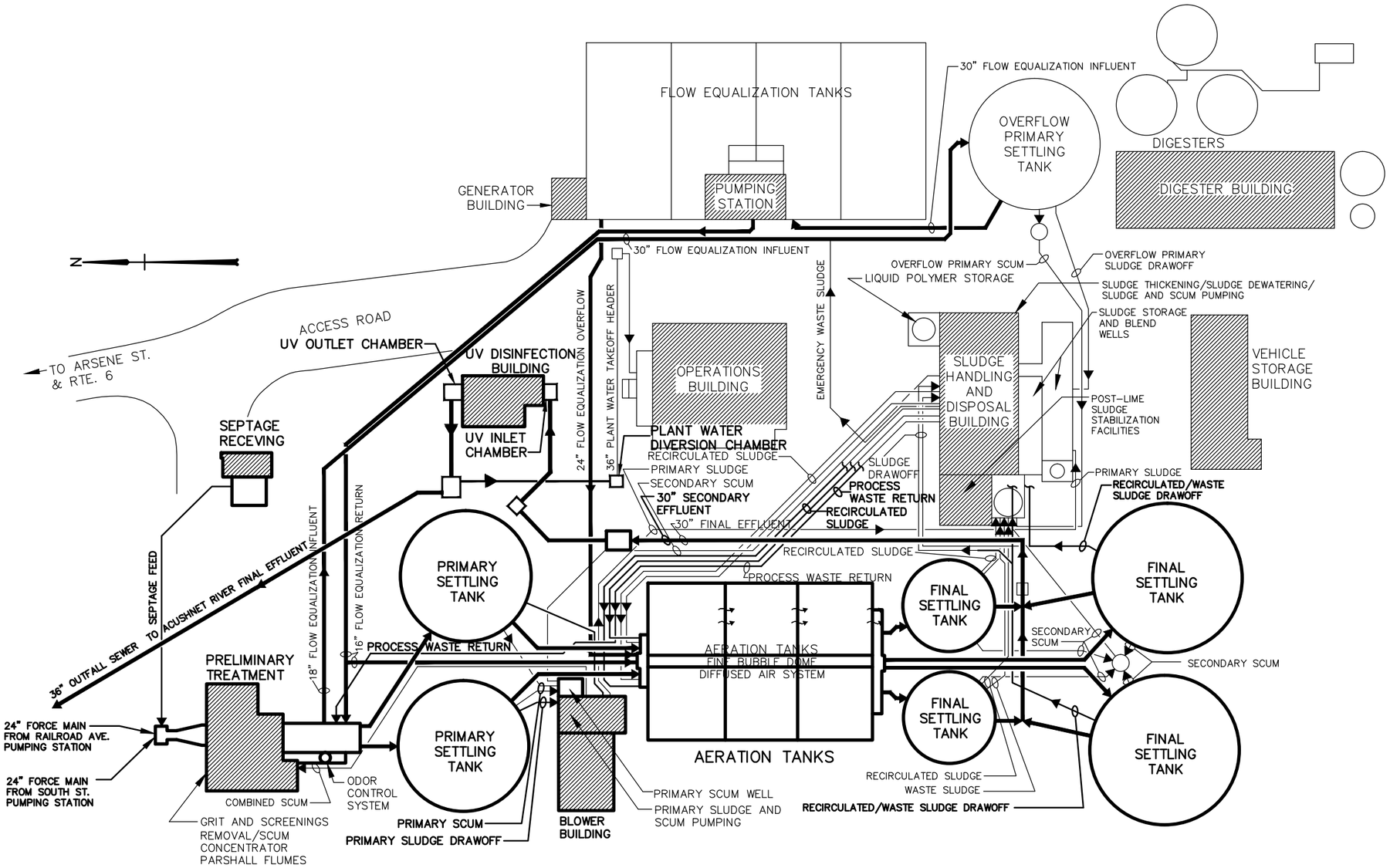
The Fairhaven WPCF is a secondary treatment plant, with a design capacity to process an average daily flow of 5.0 million gallons per day (MGD) and a peak hourly wet weather flow of 16 MGD. Figure 1 presents a flow schematic for this facility. In 2012, the Fairhaven WPCF discharged an annual average daily flow of approximately 2.63 MGD. The liquid treatment train consists of two parallel trains, each containing a mechanical bar screen, a horizontal flow-through type grit chamber, a primary clarifier, a three-chamber aeration tank and two final clarifiers followed by ultraviolet (UV) irradiation. The final effluent is disinfected by the UV system prior to being discharged into the Acushnet River via a 36" outfall sewer. Under present loading conditions (average daily flow of 2.63 MGD), only one treatment train is normally placed in operation. The Fairhaven WPCF receives approximately 7,000 gallons per day (GPD) of septage five days per week. The septage is pumped to the inlet channel at the headworks for treatment in the liquid train.

The Fairhaven WPCF has two (2) 65-ft diameter primary settling tanks, each with a capacity of 273,000 gallons. During wet weather flows, the plant wastewater influent flow can be diverted to the flow equalization facility for temporary storage. The flow equalization facilities consist of one (1) 270,000-gallon primary settling tank, and four (4) flow equalization aerated storage tanks totaling 1,980,000 gallons. Stored flows can be pumped to either the head of the primary settling tanks or the head of the aeration tanks after the plant influent flows return to normal.

Secondary treatment at the Fairhaven WPCF is provided by a conventional activated sludge system, including two (2) aeration trains, each with three (3) aeration tanks; and two (2) 45-ft diameter and two (2) 75-ft diameter settling tanks. Each aeration tank is equipped with fine bubble ceramic diffusers and has an operational volume of 155,580 gallons. The 45-ft diameter settling tanks each have a volume of 119,000 gallons, and the 75-ft diameter settling tanks each have a volume of 429,600 gallons. Settled activated sludge is returned to the head of the aeration trains using seven (7) return activated sludge (RAS) pumps, which provide an available total return flow rate of 9.7 MGD (with one large pump out of service).

Presently, the Fairhaven WPCF operates year-round with two (2) primary settling tanks, three (3) aeration tanks (i.e., one (1) aeration train) and two (2) 75-ft secondary settling tanks on-line.

In the solids treatment train, primary sludge, thickened secondary waste activated sludge (WAS) and scum are combined and pumped to new anaerobic digestion facilities to reduce the volume of and stabilize the sludge, and to produce methane gas. The digestion process consists of two mesophilic digesters that operate in series. The methane gas is stored in a membrane gas holder and is used to run an internal combustion engine generator that produces heat for the digestion



Town of Fairhaven, Massachusetts
Wastewater Management Plan

PLANT FLOW DIAGRAM
FIGURE 1

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process, provides hot water for the plant, and also generates electricity that is used onsite. Following digestion, the sludge is thickened using a gravity belt thickener. The thickened sludge is hauled off-site to a facility where it is burned to produce electricity.

3.0 DEVELOPMENT OF WASTEWATER FLOW PROJECTIONS

As previously mentioned, the current annual average daily flow rate to the Fairhaven WPCF is approximately 2.63 MGD, including domestic/commercial/industrial wastewater and infiltration/inflow (I/I). Based on a review of current available flow records for 2012, we estimate that the annual average daily flow rates from the Town of Fairhaven and the Town of Mattapoisett sewer systems are 2.29 MGD and 0.34 MGD, respectively.

Internal factors that affect future wastewater flow projections include population increase, expansion of the collection system into unsewered areas, industrial and commercial growth, and an increase in the number of connections within the existing sewered area. An external factor that will impact future wastewater flow projections for the Fairhaven WPCF is the contribution from the Town of Mattapoisett, which has expressed an interest in increasing its allotted capacity from 0.5 MGD to 1.0 MGD.

3.1 Population

Over the last several decades, the population of the Town of Fairhaven has been relatively stable. Historically, the Town's population has increased slightly through the 1980s, held relatively steady through the 1990s, and has decreased slightly through the 2000s. The population for the year 2010 was 15,873. The following table presents historical data for the Town along with population projections developed by the former Massachusetts Institute for Social and Economic Research (MISER). The successor to MISER is the Massachusetts State Data Center.

Table 1. Population Data – Town of Fairhaven

Year	Actual	MISER Population Projections		
		Low Growth	Middle Growth	High Growth
1980	15759			
1990	16132			
2000	16159			
2010	15873	15571	15905	16242
2020		15008	15744	16513

The MISER Population Projections were made in the early 2000s, based on historical census data through the year 2000. MISER-projected populations for all Massachusetts communities were based on three different growth rates: low, middle and high. As can be seen in the above table, MISER's middle growth population projection for the Town of Fairhaven of 15,905 for the year 2010 is the best fit projection for the Town's actual 2010 population of 15,873, off by only 32. Based on this middle growth rate, MISER's projection for the year 2020 anticipates a further slight decrease in population for Fairhaven to 15,744. Using on these projections, little or no growth in population is anticipated for the Town over the next decade. For this Wastewater Management Plan, we have adopted a population projection for the Town of Fairhaven of 16,000 for the year 2025.

Only a portion of the Town's population is connected to the sewer system. The current sewered population tributary to the Fairhaven WPCF on Arsene Street is estimated at 9,900.

3.2 Wastewater Flow Based on Water Usage

We reviewed the 2010 and 2011 Public Water Supply Annual Statistical Reports for the Town of Fairhaven, which provide a breakdown of metered water consumption by user categories. We used these breakdowns to estimate the current sewage component of the average daily wastewater flow for the Town, based on the report's per capita water usage of 53 GPD for the connected sewered residential population (9,900 people). We then added the computed residential flow to the flow determined for other water usage categories (commercial, industrial, municipal, institutional, etc.) in the above 2011 report. The estimated sewage flow component for 2011 based on water usage data is 707,000 GPD, which is considerably less than the estimated sewage flow based on the WPCF flow data discussed in the next section.

3.3 Wastewater Flow Based on WPCF Flow Data

We reviewed the Discharge Monitoring Reports (DMRs) for the year 2012 for the Fairhaven WPCF. Year 2012 was an exceptionally dry year for southeastern Massachusetts; at the Fairhaven WPCF only 32 inches of rainfall was recorded in 2012. We selected a low flow period in July 2012, from July 22 through July 27, to estimate the sewage flow component. The minimum nighttime flows during this period averaged only 0.38 MGD. During this same period the total daily flow averaged 1.93 MGD, of which 0.34 MGD originated from the Town of Mattapoisett. Subtracting the Mattapoisett flow from the total daily flow leaves 1.59 MGD as the total daily flow for Fairhaven. If we assume that the average minimum nighttime flow rate of 0.38 MGD is the baseline minimum I/I flow rate, we can subtract the 0.38 MGD from the Fairhaven total daily flow of 1.59 MGD to get the Fairhaven sewage flow component of 1.21 MGD.

3.4 Town of Mattapoisett Wastewater Flow

In 1977, the Town of Mattapoisett entered into an intermunicipal agreement (IMA) with the Town of Fairhaven for transporting and treating an average daily flow (ADF) of 0.25 MGD (peak flow of 2.6 MGD). In 1992, the IMA was amended to increase Mattapoisett's allotted capacity to an ADF of 0.50 MGD. The allotted peak flow rate capacity remained at 2.6 MGD. Presently, both towns are renegotiating the IMA, and Mattapoisett is requesting an additional ADF capacity allotment of 0.50 MGD, which will bring the total ADF allotment to 1.0 MGD. For the wastewater flow projections in this study, the figure of 1.0 MGD will be carried for the Town of Mattapoisett.

3.5 Wastewater Flow Projections

Based on historical data and MISER projections, the population in Fairhaven is expected to remain relatively stable over the next 10 to 15 years. Commercial and industrial growth is also expected to mirror that of population growth. Given the current regulatory environment and the public's awareness of water conservation issues, we do not anticipate an increase in the per capita water usage rate. Future increases in wastewater flow to the Fairhaven WPCF will more likely come from infill connections and redevelopment within the currently sewered areas of town, expansion of the collection system to areas of town outside the current limits of the WPCF tributary area, and contributions from out-of-town users such as Mattapoisett. The Town has

been rehabilitating sewers to reduce I/I for many years, so we expect the I/I component of the wastewater flow will at worst remain constant through the year 2025. We estimate the present average annual I/I flow rate to be 1.50 MGD, and the maximum day I/I flow rate to be 6.00 MGD, for the wastewater collection system tributary to the Fairhaven WPCF. A summary of the projected flow rates is shown in Table 2.

Table 2. Wastewater Flow Projections for Year 2025 (MGD)

	Average Daily Flow	Maximum Daily Flow
Fairhaven – current	1.21	1.80
Fairhaven – future	0.50	0.75
I/I	1.50	6.00
Mattapoisett	1.00	1.00
Total	4.21	9.55

In Table 2, the flow rate used for the Town of Mattapoisett is the allotted average daily capacity anticipated to be in the new IMA that is presently being negotiated between the two towns, and is not based on projected actual wastewater flow rates.

4.0 TOWN-WIDE SEWER PLAN UPDATE

As part of this Wastewater Management Plan, FST updated the wastewater collection system database created in 2009 by Beta, Inc. (Beta). Beta developed the database using ArcView GIS, town and MassGIS data files, and data collected in the field with hand-held GPS units. The information provided by Beta covered water, wastewater, drainage, parcels, topographic and watershed files. The Town sewer information included sewer pipes (gravity, low pressure and force mains), water and drain pipes, sewer manholes, pump stations and wastewater treatment facilities. FST also obtained additional information from MassGIS, including wetlands, bodies of water, town boundaries and roads. FST's main revision to the wastewater collection system map was to identify pump station tributary areas, and re-label manholes according to these tributary areas. Appendix A contains a town-wide wastewater collection system map (Figure A-1), and a map of the area tributary to the Taber Street Pump Station (Figure A-2) that illustrate these changes.

We recommend the Town continue to update its GIS information, adding such data as year of sewer pipe installation or rehabilitation, type of rehabilitation, and pipe invert elevation. The manhole data should include information such as structure type, cover condition and type, rim elevation, depth of manhole and pipe inverts. Sewer connection data should also be included. The Town should also continue to update its GIS database with any new construction or rehabilitation.

As a cost-effective and efficient means of updating and expanding GIS data, as well as for conducting analyses to evaluate system performance and capacity, we recommend using a subcontractor, PeopleGIS, located in Woburn, MA, to set up GIS maps of Fairhaven's collection system, and also to create forms for entering new data concerning the collection system. PeopleGIS refers to their mapping software as "MapsOnline" and the forms/database software as "People Forms". Going forward, the Town will need to provide some type of a tablet computer

to staff who will obtain field data, and will contract with PeopleGIS for training sessions on data entry and creating forms for specific applications. Using PeopleGIS for collection system updates and evaluation will afford the Town a way to automatically incorporate changes and make evaluations at minimal cost, without the need for maintaining expensive GIS software or associated staff. Utilizing the MapOnline and PeopleForms tools from PeopleGIS will enable the Fairhaven DPW to broaden their GIS to include such tasks as work order management, catch basin cleaning, sewer connections, sewer cleaning and televising, etc.

5.0 WASTEWATER TREATMENT CAPACITY AND PROCESS ASSESSMENT

5.1 WPCF Capacity

In March 2003, the United States Environmental Protection Agency (USEPA) and the Massachusetts Department of Environmental Protection (MassDEP) issued a final renewal of NPDES Permit No. MA0100765 for the Fairhaven WPCF, with an effective date established as May 4, 2003. Following this permit, a Draft NPDES permit was issued in 2010. The 2010 Draft NPDES permit limits are summarized below:

Table 3. Draft NPDES Permit

Parameter	Average Monthly	Maximum Daily
Flow	5.0 MGD	Report
BOD_5	30 mg/L	45 mg/L
TSS	30 mg/L	45 mg/L
pH	6.5 – 8.5	
Fecal Coliform	88 cfu/100 mL	260 cfu/100 mL
Enterococci	35 cfu/100 mL	276 cfu/100 mL
Total Nitrogen	125 lbs/day	Report

The changes in the permit include:

- Nitrogen limit of 125 lbs/day instead of only reporting concentration/loading.
- Addition of Enterococci with an average monthly limit of 35 colony-forming units (cfu)/100 milliliters (mL) and maximum daily limit of 276 cfu/mL.

A copy of the draft and current NPDES Permits can be found in Appendix B and C, respectively, at the end of this report.

A review of the WPCF's monthly reports for 2012 indicates that the plant is meeting all of its current NPDES permit requirements. Regarding the limitation changes in the Draft NPDES permit, we believe the facility will achieve the Enterococci limits with the recent installation of the UV disinfection system. Complying with the effluent total nitrogen loading of 125 lbs/day, however, will necessitate some plant modifications, as discussed in Section 5.2.

The Fairhaven WPCF recently began operation of an anaerobic digestion system that has experienced problems with sludge pumping to the digesters, consistent production of methane gas to supply a combined heat and power generator, and return of a poor-quality digester

supernatant to the head of the plant. Resolving these issues is a top priority for process improvement at the WPCF, and the Town is working with the anaerobic digestion designers and MassDEP to achieve this goal. In the future the WPCF may be accepting fats, oil and grease as a supplemental feed to the digesters that will boost methane production.

FST updated the plant's hydraulic profile to determine if the various unit processes could adequately handle peak design flows. Appendix D contains plans that illustrate the hydraulic profile through the main plant and also through the flow equalization facilities. These plans indicate the WPCF has no hydraulic limitations for handling peak flows, and this is borne out from past operating records.

Based on the wastewater flow projection analysis performed in Section 3 of this report, we do not anticipate that a hydraulic capacity increase will be required at the Fairhaven WPCF through the year 2025. The projected flows presented in Table 2 show an annual average daily flow of 4.21 MGD. The current annual average daily flow capacity of the Fairhaven WPCF is 5.0 MGD. The flow projections presented in Table 2 assume that wastewater flows from the Town of Mattapoisett will remain within the 1.0 MGD allotment being negotiated in the new IMA, and that I/I rates for Fairhaven will be maintained close to current levels. It also assumes that residential, commercial and industrial development within Fairhaven will follow growth rates projected by the State.

5.2 Nitrogen Reduction

FST conducted a nitrogen reduction study entitled *Nitrogen Removal Optimization Study* in 2004 to evaluate the ability of modifications to the existing aeration system to reduce the influent nitrogen, and to address nitrogen sources to the WPCF. The report determined that the Fairhaven WPCF could reduce total nitrogen by approximately 70% without significant process modifications. The report noted that the amount of total nitrogen was "normal/domestic" in terms of its concentration, and there was no identification of any major industrial or agricultural contributors. This study was conducted prior to issuance of the draft NPDES permit. With the draft requirement of 125 lbs/day of nitrogen in the effluent, the WPCF is going to need to further reduce the nitrogen with additional technologies.

Table 4 presents the results for influent and effluent total nitrogen during the study period.

Table 4. Nitrogen Reduction during 2004 Study

	Average	Range
Influent Total Nitrogen (mg/L)	27.9	12 – 48
Effluent Total Nitrogen (mg/L)	11.5	7.8 – 19

5.2.1 Existing Nitrogen Reduction

The existing WPCF uses activated sludge aeration to reduce total suspended solids (TSS) and 5-day biochemical oxygen demand (BOD_5) in the effluent of the wastewater treatment plant. This

process also has the added benefit of reducing the total nitrogen. As shown in the following table, the total nitrogen is reduced, but is still above the Draft NPDES permit limits.

Table 5. 2012 Wastewater Characteristics

	Influent		Effluent		
Parameter	**Average**	**Range**	**Average**	**Range**	**Draft NPDES Permit**
Flow (MGD)	2.6	1.8 - 6.4	--	--	5.0
TSS (mg/L)	155	33 – 525	7.7	1.0 - 28	30
BOD5 (mg/L)	146.5	29 – 525	5.5	1.0 - 31	30
Nitrogen (mg/L)	29.5	9.3 – 75	16.5	8.9 - 36	--
Nitrogen (lbs/day)	624	165 - 1,470	345	199 - 712	125

5.2.2 Potential Process Modifications for Nitrogen Reduction

Based on current influent and effluent nitrogen loadings through aeration and clarification, and the study conducted in 2004, the aeration system is able to reduce the total nitrogen with some process modifications. The proposed effluent limit of 125 lbs/day total nitrogen, which is 3.0 mg/L at a flow rate of 5 MGD, will require additional modifications. The following sections outlined below summarize the available technologies for nitrogen reduction applicable to the Fairhaven WPCF.

The following process changes and technologies may be added to the Fairhaven WPCF to reduce total nitrogen:

- Pre-anoxic Zone (with existing tanks)
- Secondary Anoxic Zone (with existing tanks)
- Carbon Source
- Mechanical Mixing
- Moving Bed Biofilm Reactor
- BioMag
- Denitrifying Settling Tank
- Denitrification Filter

A **pre-anoxic zone** could be installed in the first stage of the three aeration tanks. The installation of an anoxic zone would require the addition of mixers and recycle pumps. The flow of RAS would also need to be increased to form the anoxic zone in the first stage.

A **secondary anoxic zone** could also be used. This would require mixers to form the anoxic zone, would be preceded by an aerobic zone in the first stage, and would require the addition of a carbon source, such as methanol, into the anoxic zone.

Mechanical mixing could be used to assist with the anoxic zones and could also be used to reduce the total nitrogen by being installed in all of the aeration tanks. This option would require

all 6 of the aerators to operate in series for proper reduction of total nitrogen. In addition, the mechanical mixing by itself may not reduce total nitrogen below 3.0 mg/L, and would result in increased energy use for the mixing.

Moving Bed Biofilm Reactor (MBBR) is an Integrated Fixed Film Activated Sludge (IFAS) system with additional modifications to the aeration system including recycle flows, mixers and fixed film media. This technology also includes an anoxic zone upstream of the fixed film media. The mixers are used in the anoxic zone to mix the RAS back into the influent flow. The RAS is typically 2 to 5 times the influent flow. This keeps the MLSS constant while not introducing oxygen into the wastewater. This is followed by the fixed film media, which is typically retained on screens and serves as a space for bacteria to grow. This media would occasionally require a backwash to prevent excessive build-up of material that could lead to clogging or breakthrough. After the fixed film media the flow would continue to the secondary clarifiers.

The MBBR technology is widely available through different vendors. Typically, vendors require modifying the entire aeration system to ensure a properly operating MBBR system. The advantage to this alternative is minimal process modifications would be required to significantly increase the reduction of total nitrogen in the aeration system. The disadvantage is that the combination of membrane aeration and fixed film media may have operational issues where the media floats on the surface of the IFAS tank and leads to solids breakthrough.

BioMag is a technology currently owned by Siemens Water Technology that adds a magnetite into the aeration system that may increase biological activity and increase nitrification and denitrification.

Denitrifying settling tank would increase the amount of MLSS in the settling tank, increasing the height of the sludge blanket and resulting in the final stages of denitrification through releasing nitrogen gas. Modifications may be made to the settling tank to accommodate this process. Investigations of the condition of the existing tanks and mechanical equipment should be conducted to ensure proper operation and the ability to handle process changes.

SuperSand manufactured by Nordic Water is a continuous contact up-flow filter that continuously backwashes to prevent having to shut down. The sand media creates a biological surface for denitrification and solids reduction. An additional waste stream will be produced with this process with low solids concentration for sludge processing. A carbon source may be required for reduction of nitrogen to 3.0 mg/L.

Denifor manufactured by Infilco Degremont is a down-flow filter that provides denitrification and solids reduction. This process would require modifications to the existing process and increased operator maintenance for the filters and media. The filters would require periodic backwash with air scour to remove solid particles and nitrogen gas from the filter media. An additional waste stream will be produced with this process with low solids concentration for sludge processing. A carbon source may be required for reduction of nitrogen to 3.0 mg/L.

5.2.3 Comparison of Nitrogen Reduction Technologies

The following tables compare the various nitrogen reduction technologies.

Table 6. Comparison of Available Nitrogen Reduction Technologies

Process	Process Location
Pre-anoxic Zone	Stage 1 Aeration
Mechanical Mixing	In Aeration
Secondary Anoxic Zone	Stage 2 Aeration
Carbon Addition	Stage 1 Aeration
MBBR	In Aeration
BioMag	In Aeration
Denitrification Settling Tank	Following Aeration
Denitrification Filter	Following Secondary Settling

Table 7. Advantages & Disadvantages of Available Nitrogen Reduction Technologies

Process	Advantages	Disadvantages
Pre-anoxic Zone in Aeration Tanks	Can use existing aeration system without significant process modifications	Increased energy use May not reduce TN to 3.0 mg/L without other modifications
Anoxic Zone in 2nd Aeration Tank	Can use existing aeration system without significant process modifications	Increased energy use May not reduce TN to 3.0 mg/L without other modifications
Mechanical Mixing	Limited process changes	Increased energy use May not reduce TN to 3.0 mg/L without other modifications
Carbon Addition	Can use existing aeration system without significant process modifications	May not reduce TN to 3.0 mg/L without other modifications Requires methanol or other carbon source and dosing equipment
MBBR	Proven Technology	Potential operation issues with membrane aeration system Requires periodic backwashes
BioMag	Limited process modifications	Relatively new technology
Denitrification Settling Tank	Can use existing settling tanks	Increased solids loading into secondary settling
Denitrification Filter • **Continuous Flow** • **Periodic Backwash**	Proven Technology Able to follow many other processes to further reduce nitrogen and solids concentrations	May require additional pumping More maintenance with filter Requires periodic backwash & produces waste stream

Following a preliminary cost evaluation, FST recommends conducting a detailed investigation of the nitrogen reduction technologies and combination of process modifications, potentially followed by a pilot study to verify how low one or several of these technologies can reduce the total nitrogen for future implementation in the WPCF.

5.3 Aeration Tank Improvements

In 2013, the Town will be awarding Contract 26, which will include improvements to the secondary treatment aeration tanks. The work will consist of replacing 20 stop gates, replacing 16 slide gates, rehabilitating 22 slide and sluice gates, and rehabilitation of concrete walls, beams, and platforms. In order to complete this work, it will be necessary for the contractor to make some miscellaneous metals and electrical modifications to eliminate conflicts with the new work. This construction contract also includes an additive alternate bid item, which if included in the contract, will result in replacement of more than 1,700 existing ceramic diffusers with membrane diffusers, as well as making some repairs to the air diffuser piping system. The existing ceramic diffusers are more than 20 years old, and due to partial clogging of the porous ceramic material over time, the air distribution system is subjected to substantially higher energy losses than when the diffusers were new. From an energy loss standpoint, the new membrane material will restore the diffusers to as-new condition. It is anticipated that this contract will be completed in 2013 and will enable the town to utilize all six aeration tank cells.

6.0 WPCF CONDITIONS SURVEY UPDATE

The original Fairhaven WPCF was constructed and placed into operation in the early 1970s. In the late 1980s, the WPCF underwent a major expansion and upgrade. In 2004, UV disinfection facilities were added. In recent years, improvements and upgrades have been made in several areas: replacing mechanical bar screens; hydraulic upgrade to yard piping; replacing two roofs; HVAC and architectural upgrades at the Operations Building; and addition of the anaerobic digestion system. Except for the newer facilities listed above, many facilities and equipment at the plant are now more than 20 years old. Some of the buildings and structures still being utilized from the original plant are now more than 40 years old.

According to TR-16, *Guides for the Design of Wastewater Treatment Works*, the typical design period for wastewater treatment works is 20 years. However, the commonly accepted design life for wastewater treatment components varies, as listed below:

Tanks, Structures & Buildings	50 years
Building Systems (roofs, windows, doors, etc.)	15 – 20 years
Mechanical Process Equipment, Piping, HVAC, Plumbing, Electrical Systems:	15 – 25 years

Recognizing the extraordinary asset value represented by the existing Fairhaven wastewater treatment facilities, and the need to preserve and protect these assets, the Board of Public Works engaged FST in 2005 to perform an existing conditions assessment survey of the WPCF. Some of the tasks performed in this existing conditions survey included the following:

- Review existing data, reports, record plans, shop drawings, maintenance records, and operations reports.
- Conduct interviews with WPCF staff regarding their observations of conditions, deficiencies, abnormal maintenance requirements, operational issues, unavailability of parts, etc.
- Conduct a plant-wide existing conditions survey of buildings, structures, equipment, piping, and systems, and cataloging the condition of each, identifying equipment/structure/system deficiencies, and evaluating the need for repair, replacement or upgrade.
- Develop a database of the various structures, equipment, and system components including condition, recommended repair/upgrade, and cost for repair/upgrade.

In 2008, the Board of Public Works engaged FST to update the 2005 existing conditions survey. FST met with WPCF staff and conducted interviews, and engineers of varied disciplines (structural, HVAC, electrical, civil, process) performed a plant-wide survey of the facilities. The conditions survey database was updated with new information on the WPCF assets, such as equipment replaced, new equipment added, current condition, and updated costs for the recommended repairs, replacement, and upgrades.

For this Wastewater Management Plan, FST has updated the 2008 conditions survey database with information obtained through conference calls, conducting on-site interviews with the WPCF staff, and performing a site walk-through. We modified the database by prioritizing the recommendations into two time period categories for phased rehabilitation: 0 to 5 years, and 5 to 10 years. This will assist the Town in developing a capital improvement plan for WPCF upgrades. Appendix E contains a copy of the conditions survey database completed for this report.

7.0 INFILTRATION/INFLOW IMPACTS ASSESSMENT

While sewers have existed in some areas of Fairhaven since the early 1900s, construction of the modern wastewater collection system began around 1970. As previously stated, the current system consists of about 72 miles of gravity sewer ranging in size from 4-inch diameter to 36-inch diameter pipe. As early as the late 1970s, when the system comprised about 32 miles of sewer, I/I became a concern. In 1979, the town engaged FST to perform a system-wide I/I Analysis, which recommended additional investigations in the form of a sewer system evaluation survey (SSES), with the objective to pinpoint actual sources of I/I to be removed or reduced. In 1983, FST completed the SSES report that contained recommendations for rehabilitation of sewers and manholes. The Town implemented those recommendations by engaging FST to prepare contact documents for Contract No. 13 – Sewer System Rehabilitation. This contract, started in 1988, consisted of the following rehabilitation work: 26 sewer pipeline point repairs; replacement of 4,500 feet of sewer pipelines; installation of 1,100 feet of storm drain; cleaning, testing and sealing of pipe joints in over 14,000 feet of sewer pipelines; and rehabilitation of more than 60 sewer manholes.

In February 2004, FST prepared an I/I Control Plan in accordance with the conditions of the town's NPDES Permit (effective date of May 4, 2003) for the Fairhaven WPCF. The I/I Control

Plan presented the historical background for I/I investigations and sewer rehabilitation, and provided comparisons of current and past I/I estimates. The Plan discussed funding for I/I removal and strategies for ongoing I/I identification and removal.

Additional sewer system studies have been conducted by Tighe & Bond – *Sewer Hydraulic Model Analysis Report*, May 2010, and Brown and Caldwell – *Draft Technical Memorandum-Fairhaven I&I Analysis*, November 2009. These studies concentrated on the western section of the sewer system along the Acushnet River. This area represents the older portion of the sewer system that is tributary to the South Street Pumping Station. For the purposes of these studies, this part of the system was separated into seven metered areas. The studies indicate locations of areas from a majority of the town contributing high I/I, and provide recommendations for a rehabilitation program. Both studies cite further inspection and rehabilitation is needed in tidally-influenced areas adjacent to New Bedford Harbor. Using hydraulic modeling, the Tighe & Bond report also notes locations where sewers come close to reaching capacity limits under peak sanitary and I/I flow conditions.

The Fairhaven DPW has initiated an integrated program where the department upgrades and rehabilitates existing utilities (sewer, water, and drainage) in conjunction with annual street pavement upgrades. Utility upgrades are implemented in advance of scheduled pavement upgrades. The Sewer Department investigates sewer pipelines and manholes to determine where defective facilities exist, and makes any needed repairs to the system that would require excavation prior to the road being repaved. To aid in this program, the Sewer Department will be purchasing a new vacuum truck and television inspection equipment.

8.0 COLLECTION SYSTEM & PUMP STATION CONDITIONS ASSESSMENT

The previous section of this report provides a good summary of the history, size and rehabilitation program for the Town of Fairhaven's wastewater collection system, so the current section will focus on a discussion of the wastewater pumping stations.

The Town of Fairhaven has 7 major wastewater pump stations, and several submersible/grinder-type pump stations that serve smaller isolated areas of the town. Brown & Caldwell completed an assessment on 6 of the major pump stations – South Street, Taber Street, Abbey Street, Railroad Avenue, Pilgrim Avenue and Manhattan Street in 2009 in a report entitled *Wastewater Pump Station Assessments*. For this Wastewater Management Plan, FST performed a conditions assessment on 2 other pump stations – Pine Grove, which is an older submersible pump station, and Shannon Meadows, a Gorman-Rupp suction-lift station that experiences clogging issues.

In addition to the traditional gravity sewers and pumping stations, low pressure sewers serve a portion of the upper Sconticut Neck area, where homeowners have individual grinder pumps that discharge to common low pressure force main sewers in the public ways. These small diameter low pressure sewers eventually discharge to the conventional gravity sewer system.

The following discussion details the condition of the Pine Grove and Shannon Meadows Pumping Stations. The remaining pump stations in town are all fairly new and do not require a

conditions assessment at present. The names and locations of all of the Town's pump stations are shown on the GIS map of the collection system contained in Appendix A (Figure A-1).

8.1 Pine Grove Pumping Station

The Pine Grove wastewater pumping station, built in 1989, is located towards the northern end of Pine Grove Street, which is near the Mattapoisett town line off Route 6. The station serves approximately a dozen residential homes on Pine Grove Street. The station is a duplex submersible grinder pump station with a 6' diameter precast concrete wet well and a 3-sided, roofed precast concrete generator shelter. The front side of the shelter is open and secured with an 8' high double-leaf chain link fence gate that is kept padlocked. The generator, electrical switchgear and pump control panel are located in this shelter. The pump control panel was provided by ABS and includes a Multitrode MT2PC pump controller. Level control is by a Multitrode 10-sensor conductance probe in the wet well. The pumps are 2.5 horsepower ABS grinder pumps mounted on a rail system with quick-connect type bases. The discharge check valves and isolation plug valves are located in the wet well. The discharge piping is PVC and appears to be 2" in diameter. The influent gravity sewer line is 8" in diameter and is approximately 11.5' deep. The wet well has a 6" diameter vent pipe (no exhaust fan) and two access covers: a 30" diameter cast iron cover for access to the wet well, and a 2' x 3' cast iron cover for removal of the pumps. The diesel generator is manufactured by DMT, and the run time meter shows it has run for 540 hours. The fuel tank is an integral-base type tank. The station also has an exterior floodlight, interior lights in the shelter, and an alarm light and horn.

The following conditions were observed during the field visit or were noted by the Town staff:

- Pump rail system is loose and corroded.
- Pump base elbows are corroded.
- One pump must be pushed back into position manually in order for the pump discharge to seal with the discharge elbow.
- Check valves clog with rags. There is no bar rack or screening basket on the influent pipeline.
- Front edge of generator shelter base slab has spalled, which may be in part due to snow plows striking the concrete edge.
- Both cast iron wet well access covers are heavy and difficult to handle, and are not hinged. Town staff would prefer aluminum access hatch covers with hinged spring-assist hardware.

8.2 Shannon Meadows Pumping Station

The Shannon Meadows Pumping Station was built in 2005 as a privately-owned station to serve approximately 50 homes in the newly constructed Shannon Meadows subdivision on Oliver Street. The Town took over the station in 2011. It is located at the intersection of Rivard Street and Rivard Lane. The station is a duplex 6x6 Gorman Rupp suction lift station with a trailer-mounted standby Katolight generator (dedicated to the site and permanently wired). The wet well is a 6' diameter precast concrete structure with a 38" diameter cast iron access cover. The influent gravity sewer line appears to be 8" in diameter and enters the wet well approximately 9' below grade. There is no bar rack or basket screen on the influent gravity sewer. The 6x6 enclosure is mounted on a concrete slab that also serves as the wet well top slab. The station has

a standard Gorman Rupp pump control panel mounted inside the 6x6 enclosure and utilizes a bubbler tube system for wet well level control. The electric meter, main disconnect switch, automatic transfer switch, and exterior alarm horn and light are mounted on a 4x8 sheet of plywood located behind the 6x6 enclosure. The station is secured by a 6' high chain link fence at the facilities. There is a pole-mounted floodlight for illuminating the site for night work. The wet well actually has two top slabs. According to Town staff, the first top slab is the original top slab of the precast concrete wet well structure. It has a 30" diameter opening. The original structure was installed too low for the site grading, and the developer had to add a second 8" concrete slab to raise the finished elevation for site drainage to work properly. The second top slab has a 36" diameter opening positioned over the 30" diameter opening in the original top slab, and there is no cover for the 30" opening. The site has a short paved driveway.

According to Town staff, the 6x6 Gorman Rupp enclosure setup is difficult to service due to the compact pump and piping arrangement. The sides of the enclosure must be removed to access pumps and valves, and staff is exposed to the weather while maintaining the station.

Staff noted several problems at this station:

- Rags clogging the pumps.
- Belt problems with belt-driven pumps.
- Air release valve problems.
- Pumps do not always self-prime.
- Town needed to replace generator power control panel.
- Piping in wet well is rusting; both steel suction pipelines and cast iron force main.
- Cast iron access cover to the wet well is heavy and difficult to handle. Town staff would prefer an aluminum access hatch with hinged spring-assist hardware.

8.3 Taber Street Pumping Station

Under Contract 26, the Town will be making improvements in the wet well at the Taber Street Pumping Station. The construction work will consist of replacing all miscellaneous metals items in the wet well, such as ladders, handrails, safety chains, ship's ladder, and influent bar racks. The two influent sluice gates and the wet well dividing wall sluice gate will be replaced. The wet well heating and ventilation systems will also be replaced, including explosionproof unit heater, ductwork, exhaust fan, louvers, and dampers. Because the ventilation system air flow rate will be increased, the new louver sizes will also increase, which will require larger masonry openings. Electrical work associated with the new heating and ventilation systems will be included, as well as replacing explosionproof lighting in the wet well.

The Town plans to continue with upgrades to the Taber Street Pumping Station in two future construction contracts. The next project will include replacement of the existing standby generator and modifications to piping and to the structure to facilitate bypass pumping operations, which will be necessary in the second contract. The scope of the second contract will include replacement of pumps, motors, piping, valves, dry-side ventilation, heating, motor control center, electrical switchgear, pump control and level control systems, and flow meter. The work will likely include architectural, structural and plumbing modifications.

8.4 South Street Pumping Station

Contract 26 will also include modifications to the South Street Pumping Station. Electrical components in the existing motor control center will be replaced, and the pump control panel will be replaced with a new unit that will incorporate the existing variable frequency drives (VFDs), submersible pressure transducers, and Mission Communications panel into the new pump control scheme. Modifications will be made to the dry-side heating and ventilation systems.

8.5 Storm Flooding at Remote Pumping Stations

The Town has expressed a concern regarding the town's emergency preparedness plans for coastal storm/flooding events. In areas of the town susceptible to coastal flooding that are not protected by the hurricane dike system, during coastal storms when flooding appears to be imminent, the Town will shut down the water supply to these areas, but only after allowing residents an opportunity to evacuate. Once the water supply has been shut off, the Town then shuts down the wastewater pumping stations. Presently, this procedure requires the WPCF staff to visit each affected pumping station site to manually shut down the station. However, due to the timing of these events, the WPCF staff are sometimes arriving at pumping station sites with flood waters already covering the ground. This was the case during a recent storm at the Boulder Park and Shore Drive Pumping Stations. The Town would like to see provisions for initiating remote shut-downs at these flood-impacted stations included in a future upgrade.

9.0 RECOMMENDED ACTION PLAN

Based on the information presented in the previous sections concerning the Town of Fairhaven's needs for its wastewater collection and treatment facilities, we recommend the following actions:

- Use PeopleGIS, a company that specializes in municipal database management, to assist with upgrading and expanding the database and mapping for the wastewater collection system. This will require staff training and the purchase of tablet computers for staff who will be obtaining field information to update or add to the database and mapping. It will also require an annual maintenance agreement with PeopleGIS. The use of these database and mapping tools can be expanded to other DPW tasks such as work order management, stormwater management, roadway paving, etc.

- Appropriate local funds and/or seek other government funding sources to continue with wastewater collection system investigations and follow-up rehabilitation. In addition to sewer rehabilitation, this includes the phased rehabilitation of the Taber Street Pumping Station, and other pumping station modifications described in this and previous reports.

- Appropriate local funds and/or seek other government funding sources to continue with Fairhaven WPCF improvements as identified in the Conditions Survey in Appendix E of this report.

- Continue evaluation of nitrogen reduction technologies, and perform pilot studies of one or more feasible, cost-effective alternatives, in accordance with the timing of NPDES permit issuance and nitrogen limit in the permit.

- Work with the designers of the new anaerobic digestion system, and also MassDEP, to improve its operation and also that of the combined heat and power (CHP) system. Implementation of a system for receiving fats, oil and grease may be advisable to improve the digestion process and methane gas production for the CHP system. Assess impacts that these new facilities have on overall plant performance.

Appendices

Appendix A
Wastewater Collection System Maps

(Separate PDF File)

Appendix B
Draft NPDES Permit 2010

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act as amended, (33 U.S.C. §§1251 et seq.; the "CWA"), and the Massachusetts Clean Waters Act, as amended, (M.G.L. Chap. 21, §§26-53),

Town of Fairhaven

is authorized to discharge from the facility located at

Fairhaven Wastewater Pollution Control Facility
Arsene Street
Fairhaven, MA 02719

to receiving water named

Acushnet River (New Bedford Inner Harbor; Buzzards Bay Watershed; State Code 95-42)

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

This permit shall become effective on **(See ** below)**

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

This permit supersedes the permit issued on March 4, 2003.

This permit consists of 13 pages in Part I including effluent limitations and monitoring requirements, Part II including Standard Conditions and Definitions, and Attachments A (Toxicity Protocol) and B (Summary of Report Submittals).

Signed this day of

Director Office of Ecosystem Protection Environmental Protection Agency Boston, MA	Director Division of Watershed Management Department of Environmental Protection Commonwealth of Massachusetts Boston, MA

** This permit will become effective on the date of signature if no comments are received during public notice. If comments are received during public notice, this permit will become effective no sooner than 30 days after signature.

PART I

A.1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number **001** to the Acushnet River. Such discharges shall be limited and monitored as specified below.

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITS					MONITORING REQUIREMENTS [3]	
PARAMETER	**AVERAGE MONTHLY**	**AVERAGE WEEKLY**	**AVERAGE MONTHLY**	**AVERAGE WEEKLY**	**MAXIMUM DAILY**	**MEASUREMENT FREQUENCY**	**SAMPLE[3] TYPE**
FLOW[2]	*********	*********	5.0 MGD	*********	Report MGD	CONTINUOUS	RECORDER
FLOW[2]	*********	*********	Report MGD	*********	*********	CONTINUOUS	RECORDER
BOD_5 [4]	1252 lbs/Day 569 kg/Day	1878 lbs/Day 854 kg/Day	30 mg/l	45 mg/l	Report mg/l	3/WEEK	24-HOUR COMPOSITE [5]
TSS [4]	1252 lbs/Day 569 kg/Day	1878 lbs/Day 854 kg/Day	30 mg/l	45 mg/l	Report mg/l	3/WEEK	24-HOUR COMPOSITE [5]
pH RANGE[1]	6.5 - 8.5 SU (SEE PERMIT PAGE 5 OF 13, PARAGRAPH I.A.1.b.)					1/DAY	GRAB
FECAL COLIFORM[1,6]	*********	**********	88 cfu/100 ml	*********	260 cfu/100ml	2/WEEK	GRAB
ENTEROCOCCI [6]	*********	**********	35 cfu/100 ml	*********	276 cfu/100ml	2/Week	GRAB
TOTAL NITROGEN (TKN + NITRATE + NITRITE) [4]	125 lbs/day 57 kg/day	**********	Report mg/l	**********	Report mg/l	3/WEEK	24-HOUR COMPOSITE [5]
WHOLE EFFLUENT TOXICITY [7, 8, 9, 10]	Acute $LC_{50} \geq 100\%$ Chronic C-NOEC $\geq 12.2\%$					2/YEAR	24-HOUR COMPOSITE [5]

Sampling Location: All effluent sampling shall be conducted at the outlet of the ultraviolet disinfection system.

Footnotes:

1. Required for State Certification.

2. Report annual average, monthly average, and the maximum daily flow. The limit is an annual average, which shall be reported as a rolling average. The value will be calculated as the arithmetic mean of the monthly average flow for the reporting month and the monthly average flows of the previous eleven months.

3. All required effluent samples shall be collected at the point specified on page 2. Any change in sampling location must be reviewed and approved in writing by EPA and MassDEP.

   A routine sampling program shall be developed in which samples are taken at the same location, same time and same days of the week each month. Occasional deviations from the routine sampling program are allowed, but the reason for the deviation shall be documented in correspondence appended to the applicable discharge monitoring report.

   All samples shall be tested using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136.

4. Sampling required for influent and effluent.

5. 24-hour composite samples will consist of at least twenty four (24) grab samples taken during one consecutive 24 hour period, either collected at equal intervals and combined proportional to flow or continuously collected proportionally to flow.

6. The monthly average limits for fecal coliform and enterococci are expressed as a geometric mean.

7. The permittee shall conduct chronic (and modified acute) toxicity tests two times per year. The chronic test may be used to calculate the acute LC_{50} at the 48 hour exposure interval. The permittee shall test the Inland silverside and Sea urchin. Toxicity test samples shall be collected during months of March and September. The test results shall be submitted by the last day of the month following the completion of the test. The results are due April 30 and October 31 respectively. The tests must be performed in accordance with test procedures and protocols specified in **Attachment A** of this permit.

Test Dates	Submit Results By:	Test Species	Acute Limit LC_{50}	Chronic Limit C-NOEC
March and September	April 30 and October 31	Inland silverside and Sea urchin	≥ 100%	≥ 12.2%

After submitting **two years** and a **minimum** of **four** consecutive sets of WET test results, all of which demonstrate compliance with the WET permit limits, the permittee may request a reduction in the WET testing requirements. The permittee is required to continue testing at the frequency specified in the permit until notice is received by certified mail from the EPA that the WET testing requirement has been changed.

8. The LC_{50} is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent (no dilution) shall cause no more than a 50% mortality rate.

9. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction at a specific time of observation as determined from hypothesis testing where the test results exhibit a linear dose-response relationship. However, where the test results do not exhibit a linear dose-response relationship, the permittee must report the lowest concentration where there is no observable effect. The "12.2% or greater" limit is defined as a sample which is composed of 12.2% (or greater) effluent, the remainder being dilution water.

10. The permittee will submit a map or GIS coordinates of the receiving water sampling point with the first toxicity test under this permit If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall either follow procedures outlined in **Attachment A (Toxicity Test Procedure and Protocol) Section 1V., D1LUTION WATER** in order to obtain an individual approval for use of an alternate dilution water, or the permittee shall follow the Self-Implementing Alternative Dilution Water Guidance which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. This guidance is found in Attachment G of NPDES Program Instructions for the Discharge Monitoring Report Forms (DMRs) which is sent to all permittees with their annual set of DMRs and

may also be found on the EPA, Region I web site at http://www.epa.gov/region01/enforcementandassistance/dmr.html. If this guidance is revoked, the permittee shall revert to obtaining individual approval as outlined in **Attachment A**. Any modification or revocation to this guidance will be transmitted to the permittees as part of the annual DMR instruction package. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment A**.

Part I.A.1. (Continued)

a. The discharge shall not cause a violation of the water quality standards of the receiving waters.

b. The pH of the effluent shall not be less than 6.5 or greater than 8.5 at any time.

c. The discharge shall not cause objectionable discoloration of the receiving waters.

d. The effluent shall not contain a visible oil sheen, foam, or floating solids at any time.

e. The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand. The percent removal shall be based on monthly average values.

f. The results of sampling for any parameter done in accordance with EPA approved methods above its required frequency must also be reported.

g. If a future TMDL for the Acushnet River is completed and approved during the term of the permit, EPA may either modify or reissue the permit as necessary to incorporate any nitrogen limits mandated by the TMDL.

2. All POTWs must provide adequate notice to the Director of the following:

a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; and

b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

c. For purposes of this paragraph, adequate notice shall include information on:

(1) The quantity and quality of effluent introduced into the POTW; and

(2) Any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

3. Prohibitions Concerning Interference and Pass Through:

a. Pollutants introduced into POTW's by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

4. Toxics Control

a. The permittee shall not discharge any pollutant or combination of pollutants in toxic amounts.

b. Any toxic components of the effluent shall not result in any demonstrable harm to aquatic life or violate any state or federal water quality standard which has been or may be promulgated. Upon promulgation of any such standard, this permit may be revised or amended in accordance with such standards.

5. Numerical Effluent Limitations for Toxicants

EPA or MassDEP may use the results of the toxicity tests and chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to Section 304(a)(1) of the Clean Water Act (CWA), state water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants, including but not limited to those pollutants listed in Appendix D of 40 CFR Part 122.

B. PRETREATMENT

Within 120 days of the effective date of the permit, the permittee shall submit the results of an industrial user survey including identification of industrial users and the character and volume of pollutants contributed to the Publicly Owned Treatment Works (POTW) by the industrial users. The industrial user survey shall as a minimum include the following:

(i) Industries discharging wastes which are or may be in the future subject to local limitations or the national prohibited discharge standards found in 40 CFR Part 403.5; and

(ii) Industries discharging wastewater from processes in one or more primary industry categories (See Appendix A to 40 CFR Part 122 or Appendix C of 40 CFR Part 403).

C. UNAUTHORIZED DISCHARGES

The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from the outfall listed in Part I A.1.of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit and shall be reported in accordance with Section D.1.e. (1) of the General Requirements of this permit (Twenty-four hour reporting).

Notification of SSOs to MassDEP shall he made on its SSO Reporting Form (which includes DEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at http://www.mass.gov/dep/water/approvals/surffms.htm#sso.

Bypasses of treatment units are not authorized. If during peak flow there are emergency bypasses of any treatment unit, the permittee shall take hourly grab samples of the final effluent and test for fecal coliform and enterococci. Each incident shall be documented in a report that includes the monitoring results, and the date, time, duration of bypass and volume by`passed. This report shall be attached to the monthly DMR.

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. Preventative Maintenance Program

   The permittee shall maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges.

3. Infiltration/Inflow Control Plan:

   The permittee shall update its plan to control infiltration and inflow (I/I) to the separate sewer system. The plan shall be submitted to EPA and MassDEP **within six months of the effective date of this permit** (see page 1 of this permit for the effective date) and shall describe the permittee's program for preventing infiltration/inflow related effluent limit violations, and all unauthorized discharges of wastewater, including overflows and

by-passes due to excessive infiltration/inflow.

The plan shall include:

- An ongoing program to identify and remove sources of infiltration and inflow. The program shall include the necessary funding level and the source(s) of funding.

- An inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts. Priority should be given to removal of public and private inflow sources that are upstream from, and potentially contribute to, known areas of sewer system backups and/or overflows.

- Identification and prioritization of areas that will provide increased aquifer recharge as the result of reduction/elimination of infiltration and inflow to the system.

- An educational public outreach program for all aspects of I/I control, particularly private inflow.

Reporting Requirements:

A summary report of all actions taken to minimize I/I during the previous calendar year shall be submitted to EPA and MassDEP annually, **by March 31**. The summary report shall, at a minimum, include:

- A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year.

- Expenditures for any infiltration/inflow related maintenance activities and corrective actions taken during the previous year.

- A map with areas identified for I/I-related investigation/action in the coming year.

- A calculation of the annual average I/I and the maximum month I/I for the reporting year.

- A report of any infiltration/inflow related corrective actions taken as a result of unauthorized discharges reported pursuant to 314 CMR 3.19(20) and reported pursuant to the Unauthorized Discharges section of this permit.

4. Alternate Power Source

In order to maintain compliance with the terms and conditions of this permit, the permittee shall continue to provide an alternative power source with which to sufficiently operate its treatment works (as defined at 40 CFR §122.2).

E. SLUDGE CONDITIONS

1. The permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices, including EPA regulations promulgated at 40 CFR Part 503, which prescribe "Standards for the Use or Disposal of Sewage Sludge" pursuant to Section 405(d) of the CWA, 33 U.S.C. § 1345(d).

2. If both state and federal requirements apply to the permittee's sludge use and/or disposal practices, the permittee shall comply with the more stringent of the applicable requirements.

3. The requirements and technical standards of 40 CFR Part 503 apply to the following sludge use or disposal practices.

   a. Land application - the use of sewage sludge to condition or fertilize the soil

   b. Surface disposal - the placement of sewage sludge in a sludge only landfill

   c. Sewage sludge incineration in a sludge only incinerator

4. The requirements of 40 CFR Part 503 do not apply to facilities which dispose of sludge in a municipal solid waste landfill. 40 CFR § 503.4. These requirements also do not apply to facilities which do not use or dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g. lagoons, reed beds), or are otherwise excluded under 40 CFR § 503.6.

5. The 40 CFR. Part 503 requirements including the following elements:

   - General requirements
   - Pollutant limitations
   - Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
   - Management practices
   - Record keeping
   - Monitoring
   - Reporting

   Which of the 40 C.F.R. Part 503 requirements apply to the permittee will depend upon the use or disposal practice followed and upon the quality of material produced by a facility. The EPA Region 1 Guidance document, "EPA Region 1 - NPDES Permit Sludge Compliance Guidance" (November 4, 1999), may be used by the permittee to

assist it in determining the applicable requirements.[1]

6. The sludge shall be monitored for pollutant concentrations (all Part 503 methods) and pathogen vector attraction reduction (land application and surface disposal) at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year

less than 290	1/ year
290 to less than 1,500	1 /quarter
1,500 to less than 15,000	6 /year
15,000 +	1 /month

Sampling of the sewage sludge shall use the procedures detailed in 40 CFR 503.8.

7. Under 40 CFR § 503.9(r), the permittee is a "person who prepares sewage sludge" because it "is … the person who generates sewage sludge during the treatment of domestic sewage in a treatment works …." If the permittee contracts with *another* "person who prepares sewage sludge" under 40 CFR § 503.9(r) – i.e., with "a person who derives a material from sewage sludge" – for use or disposal of the sludge, then compliance with Part 503 requirements is the responsibility of the contractor engaged for that purpose. If the permittee does not engage a "person who prepares sewage sludge," as defined in 40 CFR § 503.9(r), for use or disposal, then the permittee remains responsible to ensure that the applicable requirements in Part 503 are met. 40 CFR §503.7. If the ultimate use or disposal method is land application, the permittee is responsible for providing the person receiving the sludge with notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.

8. The permittee shall submit an annual report containing the information specified in the 40 CFR Part 503 requirements (§ 503.18 (land application), § 503.28 (surface disposal), or § 503.48 (incineration)) by **February 19** (*see also* "EPA Region 1 - NPDES Permit Sludge Compliance Guidance"). Reports shall be submitted to the address contained in the reporting section of the permit. If the permittee engages a contractor or contractors for sludge preparation and ultimate use or disposal, the annual report need contain only the following information:

- Name and address of contractor(s) responsible for sludge preparation, use or disposal
- Quantity of sludge (in dry metric tons) from the POTW that is transferred to the sludge contractor(s), and the method(s) by which the contractor will prepare and use or dispose of the sewage sludge.

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1 This guidance document is available upon request from EPA Region 1 and may also be found at: http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf

F. MONITORING AND REPORTING

1. **For a period of one year from the effective date of the permit**, the permittee may either submit monitoring data and other reports to EPA in hard copy form, or report electronically using NetDMR, a web-based tool that allows permittees to electronically submit discharge monitoring reports (DMRs) and other required reports via a secure internet connection. **Beginning no later than one year after the effective date of the permit**, the permittee shall begin reporting using NetDMR, unless the facility is able to demonstrate a reasonable basis that precludes the use of NetDMR for submitting all DMRs and reports. Specific requirements regarding submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

a. Submittal of Reports Using NetDMR

NetDMR is accessed from: http://www.epa.gov/netdmr. Within one year of the effective date of the Permit, the permittee shall begin submitting DMRs and reports required under this permit electronically to EPA using NetDMR, unless the facility is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs and reports ("opt out request").

DMRs shall be submitted electronically to EPA no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA, including the MassDEP Monthly Operations and Maintenance Report, as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA and will no longer be required to submit hard copies of DMRs to MassDEP. However, permittees shall continue to send hard copies of reports other than DMRs (including Monthly Operation and Maintenance Reports) to MassDEP until further notice from MassDEP.

b. Submittal of NetDMR Opt Out Requests

Opt out requests must be submitted in writing to EPA for written approval at least sixty (60) days prior to the date a facility would be required under the Permit to begin using NetDMR. This demonstration shall be valid for twelve (12) months from the date of EPA approval and shall thereupon expire. At such time, DMRs and reports shall be submitted electronically to EPA unless the permittee submits a renewed opt out request and such request is approved by EPA. All opt out requests should be sent to the following addresses:

<u>Attn: NetDMR Coordinator</u>
U.S. Environmental Protection Agency, Water Technical Unit
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912

And

Massachusetts Department of Environmental Protection
Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, Massachusetts 01608

c. Submittal of Reports in Hard Copy Form

Hard copy DMR submittals shall be completed and postmarked no later than the 15th day of the month following the completed reporting period. MassDEP Monthly Operation and Maintenance Reports shall be submitted as an attachment to the DMRs. Signed and dated originals of the DMRs, and all other reports required herein, shall be submitted to the appropriate State addresses and to the EPA address listed below:

U.S. Environmental Protection Agency
Water Technical Unit
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912

The State Agency addresses are:

Massachusetts Department of Environmental Protection
Southeast Regional Office - Bureau of Resource Protection
20 Riverside Drive
Lakeville, MA 02347

And

Massachusetts Department of Environmental Protection
Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, Massachusetts 01608

Signed and dated Industrial Pretreatment Program Reports should be sent to:

U.S. Environmental Protection Agency
Office of Ecosystem Protection
5 Post Office Square, Suite 100 (OEP06-03)
Boston, MA 02109-3912
Attn. Justin Pimpare

And

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention
Industrial Wastewater Program
1 Winter Street
Boston, MA 02108

G. STATE PERMIT CONDITIONS

This Discharge Permit is issued jointly by the U. S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) under Federal and State law, respectively. As such, all the terms and conditions of this Permit are hereby incorporated into and constitute a discharge permit issued by the Commissioner of the MassDEP pursuant to M.G.L. Chap.21, §43.

Each Agency shall have the independent right to enforce the terms and conditions of this Permit. Any modification, suspension or revocation of this permit shall be effective only with respect to the Agency taking such action, and shall not affect the validity or status of this Permit as issued by the other Agency, unless and until each Agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this Permit is declared, invalid, illegal or otherwise issued in violation of State law such permit shall remain in full force and effect under Federal law as an NPDES Permit issued by the U.S. Environmental Protection Agency. In the event this Permit is declared invalid, illegal or otherwise issued in violation of Federal law, this Permit shall remain in full force and effect under State law as a Permit issued by the Commonwealth of Massachusetts.

Attachment B

Summary of Required Report Submittals*

Required Report	**Date Due**	**Submitted By:**	**Submitted To: ** (see bottom of page for key)**
Discharge Monitoring Report (DMR)	Monthly, postmarked by the 15th of the month following the monitoring month (e.g. the March DMR is due by April 15th.	Town of Fairhaven	1, 2, 3
Whole Effluent Toxicity (WET)Test Report (Part I.A.1)	April 30 and October 31 of each year	Town of Fairhaven	1, 2, 3
Pretreatment: Industrial User Survey (Part I.B.b.)	Within 120 days of permit effective date	Town of Fairhaven	1, 2, 4
I/I Control Plan (Part I.D.2)	Within 6 months of permit effective date	Town of Fairhaven	1,2
I/I Annual Report (Part I.D.2)	March 31 each year	Town of Fairhaven	1,2
Annual Sludge Report (Part I.E.8.)	February 19 each year	Town of Fairhaven	1,2

*This Table is a summary of reports required to be submitted under this NPDES permit as an aid to the permittee. If there are any discrepancies between the permit and this summary, the permittee shall follow the permit requirements.

**The addresses are for the submittal of hard copies. When the permittee begins reporting using NetDMR, submittal of hard copies of many of the required reports will not be necessary. See permit conditions for details.

1. Environmental Protection Agency
   Water Technical Unit
   5 Post Office Square, Suite 100 (OES04-4)
   Boston, Massachusetts 02109-3912

2. Massachusetts Department of Environmental Protection
   Bureau of Resource Protection
   Southeast Regional Office
   20 Riverside Drive
   Lakeville, MA 02347

3. Massachusetts Department of Environmental Protection
   Division of Watershed Management
   Surface Water Discharge Permit Program
   627 Main Street, 2nd Floor
   Worcester, Massachusetts 01608

4. EPA New England
   Attn: Justin Pimpare
   One Congress Street
   Suite 1100 - CMU
   Boston, MA 02114

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
EPA NEW ENGLAND OFFICE
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES.

NPDES PERMIT NO.: MA0100765

NAME AND ADDRESS OF APPLICANT:

William Fitzgerald, Supervisor
Fairhaven Water Pollution Control Facility
Arsene Street
Fairhaven, MA 02719

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Fairhaven Water Pollution Control Facility
Arsene Street
Fairhaven, MA 02719

RECEIVING WATER: Acushnet River (New Bedford Inner Harbor), Buzzards Bay Watershed (MA 95-42).

CLASSIFICATION: SB

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

The above named applicant has requested that the U.S. Environmental Protection Agency (EPA) re-issue its NPDES permit to discharge into the designated receiving water. **Attachment A** shows the locations of the outfall and the wastewater treatment facility. The facility is engaged in collection and treatment of domestic wastewater. The discharge is from a secondary wastewater treatment facility.

The Town of Fairhaven owns and operates a 5 million gallon per day (MGD) activated sludge wastewater treatment facility. Wastewater treatment includes preliminary, primary and secondary processes. Final effluent is disinfected using ultraviolet rays and is discharged to the Acushnet River. Sludge is sent off-site to Woonsocket, RI for incineration.

The segment of the Acushnet River receiving the Fairhaven discharge (New Bedford Inner

Harbor) is classified as SB. The designated uses for SB waters include: habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation, and shall have consistently good aesthetic value. Where designated, SB waters shall be suitable for shellfish harvesting with depuration.

The Massachusetts Year 2008 Integrated List of Waters lists the receiving water (New Bedford Inner Harbor, Coggeshall Street Bridge to hurricane barrier, Fairhaven/New Bedford) as a Category 5 water, not achieving water quality standards and requiring a total maximum daily load (TMDL). The water is listed for priority organics, metals, nutrients, organic enrichment/low DO, pathogens, oil and grease, taste, odor and color, and objectionable deposits.

II. Description of Discharge.

A quantitative description of the discharge in terms of significant effluent parameters, based on Discharge Monitoring Reports (DMRs) from January 2006 to February 2008, is shown on **Attachment B**.

III. Limitations and Conditions.

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

IV. Permit Basis and Explanation of Effluent Limitation Derivation

EPA is required to consider technology and water quality requirements when developing permit effluent limits. Technology-based treatment requirements represent the minimum level of control that must be imposed under Section 402 and 301(b) of the Act. Section 301(b)1)(B) requires that Publicly Owned Treatment Works achieve limits based on secondary treatment. Secondary treatment is defined at 40 CFR Section 133.102.

EPA regulations require NPDES permits to contain effluent limits more stringent than technology-based limits where more stringent limits are necessary to maintain or achieve federal or state water quality standards.

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards include requirements for the regulation and control of toxic constituents and also require that EPA criteria, established pursuant to Section 304(a) of the CWA, shall be used unless site specific criteria is established.

The permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic and whole effluent toxicity) that is or may be discharged at a level that caused, has reasonable potential to cause, or contributes to an excursion above any water quality criterion. An excursion occurs if the projected or actual in-stream concentrations exceed the applicable criterion. In determining reasonable potential, EPA considers existing controls on point and

non-point sources of pollution, variability to toxicity and where appropriate, the dilution of the effluent in the receiving water.

A permit may not be renewed, reissued or modified with less stringent limitations or conditions than those contained in the pervious permit unless in compliance with the anti-backsliding requirements of the CWA.

EPA's anti-backsliding provisions are found in Section 402(o) and 303(d)(4) of the CWA, and in 40 CFR 122.44(l), restrict the relaxation of permit limits, standards, and conditions. Anti-backsliding provisions require that limits in the reissued permit must be at least as stringent as those of the previous permit, unless specific conditions are met.

A. Conventional Pollutants

Under Section 301(b)(1)(B) of the CWA, POTWs must have achieved effluent limitations based upon secondary treatment by July 1, 1977. The secondary treatment requirements are set forth at 40 CFR Part 133. The regulations describe the secondary treatment requirements for biochemical oxygen demand (BOD), total suspended solids (TSS), and pH. The "Average Monthly" and "Average Weekly" BOD and TSS limitations are based on the requirements of 40 CFR 133.102. Numerical limitations for pH and fecal coliform requirements are based on state certification requirements under Section 401(a)(1) of the CWA, as described in 40 CFR 124.53.

Monitoring frequency for BOD and TSS have been increased from 1/week to 3/week and monitoring frequency for bacteria has been increased from 1/week to 2/week to conform with requirements of similar wastewater treatment facilities.

New monitoring requirements and effluent limitations for enterococci are included in the draft permit based on water quality criteria recently adopted by MassDEP and approved by EPA.

B. Non-Conventional Pollutants

1. <u>Toxics</u>

a. Whole Effluent Toxicity

EPA's *Technical Support Document for Water Quality-based Toxics Control*, EPA/505/2-90-001, March 1991, recommends using an "integrated strategy" containing both pollutant (chemical) specific approaches and whole effluent (biological) toxicity approaches to control toxic pollutants in effluent discharges entering the nation's waterways. EPA-New England adopted this "integrated strategy" on July 1, 1991, for use in permit development and issuance. These approaches are designed to protect aquatic life and human health. Pollutant-specific approaches such as those in the Gold Book and State regulations address individual chemicals, whereas, the whole effluent toxicity (WET) approach evaluates interactions between pollutants thus rendering an "overall" or "aggregate" toxicity assessment of the effluent. Furthermore, WET measures the "additive" and/or "antagonistic" effects of individual chemical pollutants which pollutant specific approaches do not,

thus the need for both approaches. In addition, the presence of an unknown toxic pollutant can be discovered and addressed through this process.

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards (314 CMR 4.00), include the narrative statement that "All surface waters shall be free from pollutants in concentrations and combinations that are toxic to humans, aquatic life or wildlife." 314 CMR 4.05(5)(e).

Federal NPDES regulations at 40 CFR §122.44(d)(1)(v) require whole effluent toxicity limits in a permit when a discharge has a "reasonable potential" to cause or contribute to an excursion above the State's narrative criterion for toxicity. WET tests of the Fairhaven WPCF's effluent show consistent compliance with effluent limitations, however the low dilution ratio (1:7.2) calculated for the discharge contributes to a "reasonable potential" that the discharge could cause an excursion of the no toxics provision in the State's regulations. Inclusion of the whole effluent toxicity limit in the Draft Permit will ensure compliance with the State's narrative water quality criterion of "no toxics in toxic amounts".

Moreover, the Massachusetts Department of Environmental Protection's Division of Watershed Management's toxics policy requires whole effluent toxicity testing for all major dischargers such as the Fairhaven POTW (Implementation Policy for the Control of Toxic Pollutants in Surface Waters, MassDEP 1990).

Therefore, based on the potential for toxicity from domestic contributions, the low level of dilution, water quality standards and in accordance with EPA and MassDEP regulation and policy, the draft permit includes acute and chronic effluent toxicity limitation and monitoring requirements. (See, e.g., "Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants: 50 Fed. Reg. 30,784 (July 24, 1985); see also, EPA's Technical Support Document for Water Quality-Based Toxic Control). The principal advantages of biological techniques are: (1) the effects of complex discharges of many known and unknown constituents can be measured only by biological analyses; (2) bioavailability of pollutants after discharge is best measured by toxicity testing; and (3) pollutants for which there are inadequate chemical analytical methods or criteria can be addressed.

The type of test (acute and/or chronic) and the effluent limitations are based on available dilution. The Draft Permit requires the permittee to perform acute toxicity tests twice per year using Inland Silverside and Sea Urchin and contains an LC50 limit of 100% effluent concentration. The LC50 is defined as the concentration of toxicant, or in this draft permit, as the percentage of effluent lethal to 50% of the test organisms during a specific length of time.

The Draft Permit also requires chronic tests twice per year using Inland Silverside and Sea Urchin and contains a Chronic-No Observed Effect Concentration (C-NOEC) limit of 14 percent. C-NOEC is defined as the highest concentration to which test organisms are exposed in a life cycle or partial life cycle test, which causes no adverse effect on growth, survival or reproduction during a specific time of observation. The C-NOEC limit was calculated as follows;

Chronic NOEC Limit Calculation:

$$\frac{1.0 * 100}{8.2} = 12.2\%$$

As a condition of this permit, the testing requirements may be reduced by a certified letter from the EPA. This permit provision anticipates that the permittee may wish to request a reduction in WET testing. After four consecutive WET tests, demonstrating compliance with the permit limits for whole effluent toxicity, the permittee may submit a written request to the EPA seeking a review of the toxicity test results. The EPA will review the test results and pertinent information to make a determination. The permittee is required to continue testing at the frequency and species specified in the permit until the permit is either formally modified or until the permittee receives a certified letter from the EPA indicating a change in the permit conditions.

b. Chlorine

In April 2004, the Town of Fairhaven completed construction of an ultraviolet light (U/V) disinfection system and has ceased using chlorine as a disinfectant. Accordingly, limitations and monitoring requirements for total residual chlorine have been removed from the permit.

c. Metals

Certain metals like copper, lead, cadmium and zinc can be toxic to aquatic life. EPA has evaluated (see below) the reasonable potential of toxicity on the concentration of metals in the effluent. Based on this evaluation EPA has determined that there is no reasonable potential for adverse impact on the aquatic life and no need to monitor and limit these metals.

Calculation of reasonable potential for copper, lead, zinc and cadmium:

All effluent metals data are taken from the Toxicity Test Reports from the period March 2004 to March 2008.

Total allowable Receiving Water Concentration, C = Criteria (Tot. Rec.) x Dilution Factor/Conversion Factor

EPA 2002 National Recommended Water Quality Criteria for salt water and the dilution factor of 8.2 [calculated dilution ratio is 7.2:1 based on EPA approved UM Model with a discharge from a single 36 inches diameter port oriented at 90 degrees; dilution factor = (7.2 + 1)/1 = 8.2] are used to calculate effluent limits.

Copper:	Chronic	C = 3.1 x 8.2 / 0.83 = 30.6 ug/l which is greater than the monthly average effluent concentration range of 10 - 20 ug/l. So, reasonable potential does not exist.

	Acute	C = 4.8 x 8.2 / 0.83 = 47.4 ug/l which is greater than the maximum effluent concentration of 20 ug/l. So, reasonable potential does not exist.
Lead:	Chronic	C = 8.1 x 8.2 /0.951 = 69.8 ug/l which is greater than the monthly average effluent concentration range of 2.7 - 10 ug/l. So, reasonable potential does not exist.
	Acute	C = 210 x 8.2 /0.951 = 1811 ug/l which is greater than the maximum effluent concentration of 10 ug/l. So, reasonable potential does not exist.
Zinc:	Chronic	C = 81 x8.2 /0.946 = 702 ug/l which is far greater than the monthly average effluent concentration range of 12 - 50 ug/l. So, reasonable potential does not exist.
	Acute	C = 90 x8.2 /0.946 = 780 ug/l which is far greater than the maximum effluent concentration of 50 ug/l. So, reasonable potential does not exist.
Cadmium:	Chronic	C = 9.3 x 8.2 /0.994 =76.7 ug/l which is greater than the monthly average effluent concentration of 0.5 -10 ug/l. So, reasonable potential does not exist.
	Acute	C = 42 x 8.2 / .994 = 346 ug/l which is far greater than the maximum effluent concentration of 10 ug/l. So, reasonable potential does not exist.

2. Nutrients

a. Nitrogen

As described earlier, the receiving water is listed as impaired due to, among other things, nutrients, organic enrichment/low DO, taste, odor and color, and objectionable deposits. Numerous studies, as summarized below, have identified nitrogen enrichment as causing or contributing to these impairments. Excessive nitrogen causes algae blooms that deplete dissolved oxygen, causes visible color and turbidity, and ultimately decay causing objectionable odors and oxygen demanding sediments.

The current permit required the Town to evaluate and implement optimization of nitrogen removal processes at the WPCF. In November 2004, the Town completed a Draft Nitrogen Removal Optimization Study which evaluated influent nitrogen loadings and control options, and also evaluated the practicable extent to which nitrogen removal at the existing treatment facility could be further optimized. The study found that during the period from July 2000 to July

2004, the total nitrogen (TN) concentration in the treatment plant influent ranged from 11 to 53 mg/l with an average concentration of 29 mg/l. For the same period, TN in the effluent ranged between 5 to 22 mg/l with an average concentration of 13 mg/l. This translates to an average removal efficiency of 55%. The study concluded that with some operational changes, this efficiency could be improved to 70%. At an influent concentration of 29 mg/l and a removal rate of 70 %, the resulting effluent concentration would be about 9 mg/l.

Recent discharge monitoring reports (DMRs) for the months of January 2006 to February 2008 show an average effluent TN concentration of 15.3 mg/l, suggesting that the operational changes were not implemented.

Past Studies

The final Buzzards Bay Comprehensive Conservation and Management Plan dated August 1991, identified nitrogen loading as one of the most serious problems threatening many embayments around Buzzards Bay.

In 1994, the Buzzards Bay Project published a draft report titled " A Buzzards Bay Embayment Sub-watershed Evaluation: Establishing Priorities for Nitrogen Management Action". This report highlighted the major sources of nitrogen to New Bedford Inner Harbor and all other Buzzards Bay embayments. The report identified the Fairhaven wastewater treatment plant as the major source of nitrogen to the Inner Harbor.

On March 6, 1998 a refined evaluation of nitrogen loading and water quality of New Bedford Inner Harbor (Acushnet River) as it relates to the Fairhaven wastewater treatment facility was completed by the Buzzards Bay Project. The report concluded that the Fairhaven wastewater plant is the single largest source of nitrogen to the estuary.

On July 28, 2000, another report by the Buzzards Bay Project titled "A Preliminary Evaluation of Nitrogen Loading and Water Quality of New Bedford Inner Harbor (Acushnet River) as it relates to the Fairhaven Wastewater Treatment Facility", further refined the nitrogen loadings and again concluded that the Fairhaven wastewater plant is the single largest source of nitrogen.

MassDEP has completed a report (dated December 2008) entitled "Massachusetts Estuaries Project – Linked Watershed-Embayment Model to Determine Critical Nitrogen Loading Thresholds for the New Bedford Inner Harbor Embayment System, New Bedford, MA." The report documents nitrogen-caused impacts on the Acushnet River - New Bedford Inner Harbor embayment system from its headwaters to the hurricane barrier in New Bedford. The report uses historic sources as well as data collected for the study, quantifies sources of nitrogen to the receiving waters, summarizes hydrodynamic and water quality models developed to analyze the impacts of nitrogen loads, establishes a target nitrogen concentration necessary to achieve water quality standards, and using the water quality model evaluates scenarios for achieving the nitrogen target.

In determining the nitrogen threshold for the embayment, the study focused on habitat parameters (particularly infauna[1] since eelgrass has not grown in the receiving waters for at least 50 years), sediment characteristics, and nutrient-related water quality information (particularly dissolved oxygen, chlorophyll *a*[2] and macroalgae).

Benthic animal populations are influenced by dissolved oxygen and sediment quality. Low organic matter loading and high dissolved oxygen (DO) concentrations generally support healthy habitat and high organic matter loading and low DO do not support healthy habitat. Depletion of oxygen may occur only infrequently yet may have severe effect on system health. High chlorophyll *a* indicates large amounts of algae in the receiving water, which can cause large diurnal swings in dissolved oxygen as the algae produce oxygen during daylight hours and consume it during hours of darkness. Algae blooms also reduce sunlight penetration into the water column, generate high sediment oxygen demands as it dies and decays, and cause odors and visual impairments.

The study found impairment of infaunal habitat quality due to oxygen depletion, the magnitude of daily oxygen excursions, and organic matter enrichment from phytoplankton production (chlorophyll *a* level) at all monitoring locations. These impacts are indicative of nutrient enriched waters, specifically moderate to high nitrogen loading rates.. The study concluded that nitrogen enrichment is related to the dissolved oxygen depletion. Additionally, due to the increased phytoplankton production, the dissolved oxygen levels can rise significantly during daylight hours, due to photosynthesis, to concentrations above atmospheric equilibration. Oxygen levels above atmospheric equilibration is indicative of enriched nitrogen and associated organic matter. All monitoring locations showed periodic oxygen depletions below 5 mg/l and generally less than 4 mg/l.

The upper basin has a moderately impaired benthic habitat due to macroalgal accumulation, high chlorophyll a levels, frequent depletions of DO, and a preponderance of stress tolerant species.

The middle basin is a depositional area with sediments consisting of organic rich mud. The middle basin has moderate to high chlorophyll levels, frequent DO depletions and a moderately impaired infaunal community.

The lower basin is slightly to moderately impaired by nitrogen enrichment with significant impairment in localized areas of physical disturbance or altered flushing. The lower basin experiences moderate oxygen depletions and elevated chlorophyll a levels.

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1 Infauna are benthic animals that live in the substrate of a body of water, especially in a soft sea bottom. Infauna usually construct tubes or burrows and are commonly found in deeper and subtidal waters. Clams, tubeworms, and burrowing crabs are infaunal animals.

2 Chlorophyll is the green pigment found in all plants. Chlorophyll *a* is measured to estimate the abundance of phytoplankton in the water. More chlorophyll a indicates that there are more phytoplankton present. Most chlorophyll a is found near the surface of the water because there is less light at depth. Chlorophyll a concentrations are often highest just below the surface, not at the surface of the water.

In general, the data indicate a gradient in oxygen depletion and chlorophyll a levels from the upper to the lower basins. Consistent with the estuarine response to over-enrichment from nitrogen, the extent of bottom water oxygen depletion parallels the levels of phytoplankton biomass.

Limit Derivation:

The "Massachusetts Estuaries Project – Linked Watershed-Embayment Model to Determine Critical Nitrogen Loading Thresholds for the New Bedford Inner Harbor Embayment System, New Bedford, MA" report developed a loading scenario which would achieve the target total nitrogen concentration of 0.5 mg/l at the most highly impacted "sentinel" location at the head of the middle basin of the Acushnet River (see figure VIII-I) of the report.

The water quality model was first run assuming the elimination of loads from CSOs and the elimination of the Fairhaven WPCF discharge. Under this scenario, the desired nitrogen target of 0.5 mg/l was not achieved. A 13 percent reduction of loads from septic tank discharges was then added, resulting in attainment of the desired target. The estimated loads under this scenario were:

Current total nitrogen load = 310 kg/day (sum of loads from Fairhaven WPCF, New Bedford CSOs, septic, runoff, and fertilizer)

- CSO load eliminated = 25.7 kg/day reduction

- Fairhaven TN load is eliminated = 39236 kg/year = 107.5 kg/day reduction

- 13 percent of septic load eliminated = 11.4 kg/day reduction

Load meeting target TN concentration = 310 kg/day – 107.5 kg/day - 25.7 kg/day - 11.4 kg/day = 165.4 kg/day

The analysis shows that a TN load of about 165 kg/day is necessary to achieve the target concentration at the sentinel location. The Fairhaven treatment plant currently discharges about 256 lbs/day (116 kg/day) of TN (calculated 2006-2007 average load based on a flow of 1.99 MGD and 15.43 mg/l, which is somewhat greater than the 107.5 kg/day used for the study estimate). The treatment plant discharge of TN therefore has the reasonable potential to cause or contribute to the exceedance of the target concentration given that the current discharge represents about 37 percent of the current loading and 70 percent of the loading that will achieve the target concentration.

Regulations at 40 CFR Part 122.44(d)(1) require that effluent limitations must be included for any pollutant discharge at a level that has the reasonable potential to cause, or contribute to an excursion above any State water quality standard.

Additional scenarios evaluated in the Massachusetts Estuaries Project (MEP) report included the

Fairhaven treatment plant discharging at 3.0 mg/l total nitrogen and various levels of CSO remediation and septic system elimination (see page 173-176). These scenarios provide the necessary detail to determine the extent of CSO remediation and septic system elimination that will need to be accomplished in addition to reducing the Fairhaven treatment plant loading to the limit of technology (3.0 mg/l total nitrogen). Given the magnitude of the overall load reduction necessary to achieve the target load (about 165 kg/day) a high level of removal at Fairhaven, as well as high levels of removal from CSO and septic tank sources are necessary.

A TMDL has not been completed for this receiving water, but the information discussed above shows the reasonable potential for nitrogen discharges from the Fairhaven WPCF to cause or contribute to exceedances of water quality standards and shows that a total nitrogen effluent limit of 3 mg/l at the facility design flow of 5 MGD (coupled with significant reductions in other sources of nitrogen) is necessary to attain water quality standards. Accordingly, EPA and MassDEP have included a monthly average limitation of 57 kg/day (125 lbs/day), which corresponds to treatment plant flow of 5.0 MGD and an effluent concentration of 3 mg/l TN.

The draft permit requires total nitrogen monitoring three times per week. Following completion of the TMDL, EPA will either modify or reissue the permit as necessary to incorporate the nitrogen limits mandated by the TMDL.

C. Other Monitoring Requirements

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

D. Pretreatment Program

Pollutants introduced into POTW's by a nondomestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

The permittee will perform an Industrial User Survey as stated in the draft permit.

E. Sludge

In February 1993, the Environmental Protection Agency (EPA) promulgated standards for the use and disposal of sewage sludge. The regulations were promulgated under the authority of section 405(d) of the Clean Water Act (CWA). Section 405(d) of the CWA requires that sludge conditions be included in all municipal permits. The sludge conditions in the draft permit satisfy this requirement.

F. Essential Fish Habitat Determination (EFH)

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C.§1801 et seq.(1998)), EPA is required to consult with NMFS if EPA's action or proposed actions that it funds, permits, or undertakes, may adversely impact any

essential fish habitat.16 U.S.C.§1855(b). The Amendments broadly define essential fish habitat as: waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. 16 U.S.C.§1802(10). Adversely impact means any impact which reduces the quality and/or quantity of EFH. 50C.F.R.§600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

Essential fish habitat is only designated for fish species for which federal Fisheries Management Plans exist. 16 U.S.C§1855(b)(1)(A). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

Attachment C is the list of 16 managed species that are believed to be present during one or more life-stage within EFH Area, which encompasses the existing discharge site. No "habitat areas of particular concern", as defined under §600.815(a)(9) of the Magnuson-Stevens Act, have been designated for this site. Although EFH has been designated for this general location, EPA has concluded that this activity is not likely to adversely affect EFH or its associated species for the following reasons:

- This is a re-issuance of an existing permit;
- The quantity of discharge from the WWTF is 5.0 mgd monthly average; Effluent receives as a minimum secondary treatment using activated sludge processes;
- Effluent is discharged into the Acushnet River (New Bedford Inner Harbor) with an estimated dilution ratio of 7.2:1;
- Use of chlorine has been discontinued due to installation of a new Ultra - Violet (U/V) ray system to disinfect fecal coliform;
- A new monthly average total nitrogen limit of 125 lbs/day is established in the draft permit;
- Acute and chronic toxicity tests will be conducted on Inland Silverside and Sea urchin two times per year;
- The permit will prohibit any violation of state water quality standards.

Accordingly, EPA has determined that a formal EFH consultation with NMFS is not required. If adverse impacts to EFH are detected as a result of this permit action, NMFS will be notified and an EFH consultation will be promptly initiated.

G. Endangered Species

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA) grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and habitat of such species that has been designated as critical (a "critical habitat"). The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical

habitat. The United States Fish and Wildlife Service (USFWS) typically administers Section 7 consultations for bird, terrestrial, and freshwater aquatic species. The National Marine Fisheries Service (NMFS) typically administers Section 7 consultations for marine species and anadromous fish.

EPA has reviewed the federal endangered or threatened species of fish and wildlife to see if any listed species might potentially be impacted by the re-issuance of this NPDES permit. The review has focused primarily on Bristol County since the discharge is into the Buzzards Bay. Sea Turtles (Green, Kemp's Ridley Leatherback) are listed as endangered species and Sea Turtles (Green and Loggerhead) are listed as threatened species. Based on the conditions in the permit, which are as, or more stringent than in the present permit, EPA has determined that there will be no adverse effects on these species (see section F, EFH for a discussion of the pertinent permit conditions).

EPA is coordinating a review of this finding with NMFS and/or USFWS through the Draft Permit and Fact Sheet and consultation under Section 7 of the ESA with NMFS and/or USFWS is not required. If adverse impacts are detected as a result of this permit action, NMFS and/or USFWS will be notified and a consultation will be promptly initiated.

H. Anti-degradation

This draft permit is being reissued with an allowable wasteload identical to the current permit with the same parameter coverage and no change in outfall location. The State of Massachusetts has indicated that there will be no lowering of water quality and no loss of existing water uses and that no additional anti-degradation review is warranted.

V. State Certification Requirements.

The staff of the Massachusetts Department of Environmental Protection has reviewed the draft permit. EPA has requested permit certification by the State pursuant to 40 CFR 124.53 and expects that the draft permit will be certified.

VI. Public Comment Period, and Procedures for Final Decision

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 the arguments in full by the close of the public comment period, to the U.S. EPA, MA NPDES Municipal Permit Branch 5, Post Office Square , Suite 100 (OEP 6-4), Boston, Massachusetts 02109-3912. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator 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 or requested notice.

VII. Monitoring and Reporting

The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308 (a) of the CWA in accordance with 40 CFR §§122.41 (j), 122.44 (l), and 122.48.

The Draft Permit includes new provisions related to Discharge Monitoring Report (DMR) submittals to EPA and the State. The Draft Permit requires that, no later than one year after the effective date of the permit, the permittee submit all monitoring data and other reports required by the permit to EPA using NetDMR, unless the permittee is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs and reports ("opt out request").

In the interim (until one year from the effective date of the permit), the permittee may either submit monitoring data and other reports to EPA in hard copy form, or report electronically using NetDMR.

NetDMR is a national web-based tool for regulated Clean Water Act permittees to submit discharge monitoring reports (DMRs) electronically via a secure Internet application to U.S. EPA through the Environmental Information Exchange Network. NetDMR allows participants to discontinue mailing in hard copy forms under 40 CFR 122.41 and 403.12. NetDMR is accessed from the following url: http://www.epa.gov/netdmr Further information about NetDMR, including contacts for EPA Region 1, is provided on this website.

The Draft Permit requires the permittee to report monitoring results obtained during each calendar month using NetDMR no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA and will no longer be required to submit hard copies of DMRs to MassDEP. However, permittees must continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP.

The Draft Permit also includes an "opt out" requests process. Permittees who believe they can not use NetDMR due to technical or administrative infeasibilities, or other logical reasons, must demonstrate the reasonable basis that precludes the use of NetDMR. These permittees must submit the justification, in writing, to EPA at least sixty (60) days prior to the date the facility would otherwise be required to begin using NetDMR. Opt outs become effective upon the date of written approval by EPA and are valid for twelve (12) months from the date of EPA approval. The opt outs

expire at the end of this twelve (12) month period. Upon expiration, the permittee must submit DMRs and reports to EPA using NetDMR, unless the permittee submits a renewed opt out request 60 days prior to expiration of its opt out, and such a request is approved by EPA.

Until electronic reporting using NetDMR begins, or for those permittees that receive written approval from EPA to continue to submit hard copies of DMRs, the Draft Permit requires that submittal of DMRs and other reports required by the permit continue in hard copy format.

VIII. EPA Contact

Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

Suprokash Sarker, P.E.
Municipal Permits Branch
Environmental Protection Agency
5 Post Office Square, Suite 100 (OEP 6-4)
Boston, MA 02109-3912
Telephone: (617) 918-1693
E–Mail: sarker.soupy@epa.gov

_____
Date

Stephen Perkins, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

MASSACHUSETTS DEPARTMENT OF
ENVIRONMENTAL PROTECTION
COMMONWEALTH OF MASSACHUSETTS
1 WINTER STREET
BOSTON, MASSACHUSETTS 02108

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY
OFFICE OF ECOSYSTEM PROTECTION
REGION I
BOSTON, MASSACHUSETTS 02203

JOINT PUBLIC NOTICE OF A DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE INTO THE WATERS OF THE UNITED STATES UNDER SECTION 301 AND 402 OF THE CLEAN WATER ACT (THE "ACT"), AS AMENDED, AND REQUEST FOR STATE CERTIFICATION UNDER SECTION 401 OF THE ACT.

DATE OF NOTICE: July 8, 2010

PERMIT NUMBER: MA0100765

PUBLIC NOTICE NUMBER: MA-020-10

NAME AND MAILING ADDRESS OF APPLICANT:

Fairhaven Water Pollution Control Facility
Arsene Street
Fairhaven, Massachusetts 02719

NAME AND ADDRESS OF THE FACILITY WHERE DISCHARGE OCCURS:

Fairhaven Water Pollution Control Facility
Arsene Street
Fairhaven, Massachusetts 02719

RECEIVING WATER: Acushnet River (New Bedford Inner Harbor)

RECEIVING WATER CLASSIFICATION: Class SB

PREPARATION OF THE DRAFT PERMIT:

The U.S. Environmental Protection Agency, (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) have cooperated in the development of a permit for the above identified facility. The effluent limits and permit conditions imposed have been drafted to assure that State Water Quality Standards and provisions of the Clean Water Act will be met. EPA has formally requested that the State certify this draft permit pursuant to Section 401 of the Clean Water Act and expects that the draft permit will be certified.

INFORMATION ABOUT THE DRAFT PERMIT:

A fact sheet or a statement of basis (describing the type of facility; type and quantity of wastes; a brief summary of the basis for the draft permit conditions; and significant factual, legal and policy questions considered in preparing the draft permit) may be obtained at no cost at

http://www.epa.gov/region1/npdes/draft_permits_listing_ma.html or by writing or calling EPA's contact person named below:

Suprokash Sarker
US EPA
5 Post Office Square
Suite 100
Mail Code – OEP06-1
Boston, MA 02109-3912
Telephone: (617) 918-1693

The administrative record containing all documents relating to this draft permit is on file and may be inspected at the EPA Boston office mentioned above between 9:00 a.m. and 5:00 p.m., Monday through Friday, except holidays.

PUBLIC COMMENT AND REQUEST FOR PUBLIC HEARING:

All persons, including applicants, who believe any condition of this draft permit is inappropriate, must raise all issues and submit all available arguments and all supporting material for their arguments in full by **August 6, 2010**, to the U.S. EPA, 5 Post Office Square, Suite 100, (OEP 06-1) Boston, Massachusetts 02109-3912. Any person, prior to such date, may submit a request in writing to EPA and the State Agency for a public hearing to consider this draft permit. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on this draft permit the Regional Administrator will respond to all significant comments and make the responses available to the public at EPA's Boston office.

FINAL PERMIT DECISION:

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator 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 or requested notice.

Glenn Haas, Director
DIVISION OF WATERSHED MANAGEMENT
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

Stephen Perkins, Director
OFFICE OF ECOSYSTEM PROTECTION
ENVIRONMENTAL PROTECTION AGENCY

Appendix C
NPDES Permit 2003

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act as amended, (33 U.S.C. §§1251 et seq.; the "CWA"), and the Massachusetts Clean Waters Act, as amended, (M.G.L. Chap. 21, §§26-53),

Town of Fairhaven
Arsene Street, Fairhaven, MA 02719

is authorized to discharge from the facility located at

Fairhaven Wastewater Treatment Plant
Arsene Street
Fairhaven, MA 02719

to receiving water named

Acushnet River (New Bedford Inner Harbor; Buzzards Bay Watershed; State Code 95)
in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective **60 days after signature**.

This permit and the authorization to discharge expire **at midnight, two (2) years from the effective date.**

This permit supersedes the permit issued on September 28, 1989 and modified on March 30, 1990.

This permit consists of 12 pages in Part I including effluent limitations, monitoring requirements, Attachment A, Marine Chronic Toxicity Test; Attachment B, Sludge Guidance; and 35 pages in Part II including General Conditions and Definitions.

Signed this 3rd day of April, 2003

/SIGNATURE ON FILE/

Director	Director
Office of Ecosystem Protection	Department of Watershed Management
Environmental Protection Agency	Department of Environmental Protection
Boston, MA	Commonwealth of Massachusetts
	Boston, MA

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number 001. Such discharge shall be limited and monitored by the permittee as specified below.

Effluent Characteristic	Units	Discharge Limitation			Monitoring Requirement	
		Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Flow	mgd	5.0 [2]	----	Report	Continuous	Recorder
BOD_5 [4]	mg/l lbs/day	30 1252	45 1878	Report ------	1/Week	24-Hour Composite[5]
TSS [4,12]	mg/l lbs/day	30 1252	45 1878	Report -------	1/Week	24-Hour Composite[5]
Settleable Solids [1]	ml/l	0.1	----	0.3	1/Day	24-Hour Composite[5]
pH [12]		(See Condition I.A.1.b. on Page 6)			1/Day	Grab
Fecal Coliform Bacteria[1,6,12]	cfu/100 ml	88	----	260	1/Week	Grab
Total Residual Chlorine[1,7]	ug/l	61.5	----	107	3/Day	Grab
Total Nitrogen (Total of TKN + Nitrite + Nitrate)	mg/l lbs/day	Report Report	---- ----	Report Report	1/Week[4]	24-Hour Composite[5]
LC_{50} [8,9,11]	%	----	----	100	2/year	24-Hour Composite[5]
Chronic NOEC [8,10,11]	%	----	----	>12.2	2/year	24-Hour Composite[5]

Sampling location: Effluent sampling for total residual chlorine and fecal coliform shall be performed at the man-hole location near the end of the outfall pipe. All other effluent sampling shall be conducted at the distribution box after chlorination. Upon completion of the ultra-violet disinfection system, all effluent sampling shall be conducted at the outlet of the ultra-violet disinfection system.

Footnotes:

1. Required for State Certification.

2. For flow, report maximum and minimum daily rates and total flow for each operating date. This is an annual average limit, which shall be reported as a rolling average. The first value will be calculated using the monthly average flow for the first full month ending after the effective date of the permit and the eleven previous monthly average flows. Each subsequent month's DMR will report the annual average flow for the previous 12 months.

3 All required effluent samples shall be collected at the point specified in permit. Any change in sampling location must be reviewed and approved in writing by EPA and MADEP. All samples shall be tested using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136. All samples shall be 24 hour composites unless specified as a grab sample in 40 CFR §136.

4. Sampling required for influent and effluent.

5. A 24-hour composite sample will consist of at least twenty four (24) grab samples taken over a 24 hour period.

6. Fecal coliform monitoring will be conducted year round. This is also a State certification requirement. This monitoring shall be conducted concurrently with the TRC sampling described below. The monthly average limit is expressed as a geometric mean.

7. The minimum level (ML) for total residual chlorine is defined as 50 ug/l. This value is the minimum level for chlorine using EPA approved methods found in the most currently approved version of Standard Methods for the Examination of Water and Wastewater, Method 4500 CL-E and G, or United States Environmental Protection Agency Manual of Methods of Analysis of Water and Wastes, Method 330.5. One of these methods must be used to determine total residual chlorine. Sample results of 50 ug/l or less shall be reported as zero on the discharge monitoring report.

   The permittee is required to complete construction and begin operation of an ultraviolet ray (UV) disinfection system by April 1, 2004. The new limits for TRC will not be effective until April 1, 2004. During the interim period (from the effective date of the permit until April 1, 2004) the previous permit maximum daily limit of of 0.29 mg/l will be in effect. However, between October 15, 2003 and April 1, 2004, during the construction of the UV disinfection system, the permittee will not be required to disinfect its discharge. The permittee shall notify the Massachusetts Division of Marine Fisheries, EPA, and MADEP at least two weeks prior to terminating chlorination, and upon completion of the UV disinfection system. Upon termination of chlorination, the monitoring requirements for TRC shall end, if not used.

8. The permittee shall conduct chronic (and modified acute) toxicity tests two times per year. The chronic test may be used to calculate the acute LC_{50} at the 48 hour exposure interval. The permittee shall test the Inland silverside and Sea urchin. Toxicity test samples shall be collected during the second week of the months of March, and September . The test results shall be submitted by the last day of the month following the completion of the test. The results are due April 30th and October 31st respectively. The tests must be performed in accordance with test procedures and protocols specified in **Attachment A** of this permit.

Test Dates Second week in	**Submit Results By:**	**Test Species**	**Acute Limit LC_{50}**	**Chronic Limit C-NOEC**
March and September	April 30th and October 31st	Inland silversde and Sea urchin See Attachment A	$ 100%	$ 12.2%

After submitting four consecutive sets of WET test results, all of which demonstrate compliance with the WET permit limits, the permittee may request a reduction in the frequency of required WET testing. The permittee is required to continue testing at the frequency specified in the permit until notice is received by certified mail from the EPA that the WET testing requirement has been changed.

9. The LC_{50} is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent (no dilution) shall cause no more than a 50% mortality rate.

10. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction at a specific time of observation as determined from hypothesis testing where the test results exhibit a linear dose-response relationship. However, where the test results do not exhibit a linear dose-response relationship, the permittee must report the lowest concentration where there is no observable effect. The "12.2% or greater" limit is defined as a sample which is composed of 12.2% (or greater) effluent, the remainder being dilution water. This is a maximum daily limit derived as a percentage of the inverse of the dilution factor of 8.2.

11. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall follow procedures outlined in **Attachment A Section IV., DILUTION WATER** in order to obtain permission to use an alternate dilution water. In

lieu of individual approvals for alternate dilution water required **in Attachment A**, EPA-New England has developed a Self-Implementing Alternative Dilution Water Guidance document (called "Guidance Document") which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. If this Guidance document is revoked, the permittee shall revert to obtaining approval as outlined in **Attachment A**. The "Guidance Document" has been sent to all permittees with their annual set of DMRs and Revised Updated Instructions for Completing EPA's Pre-Printed NPDES Discharge Monitoring Report (DMR) Form 3320-1 and is not intended as a direct attachment to this permit. Any modification or revocation to this "Guidance Document" will be transmitted to the permittee as part of the annual DMR instruction package. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment A**

12. During the use and emptying of the flow equalization units, the following samples shall be collected after the flow equalization pumps :

TSS and pH — TSS shall be a manual composite on the basis of a minimum of 3 grab samples during a regular working day; pH shall be a grab sample.

During the use and emptying of the flow equalization units [when using either chlorination and/or ultra violet ray disinfection] , a representative fecal coliform sample of the effluent shall be collected at the distribution box after disinfection.

Part I.A.1. (Continued)

a. The discharge shall not cause a violation of the water quality standards of the receiving waters.

b. The pH of the effluent shall not be less than 6.5 nor greater than 8.5 at any time, unless these values are exceeded as a result of an approved treatment process.

c. The discharge shall not cause objectionable discoloration of the receiving waters.

d. The effluent shall contain neither a visible oil sheen, foam, nor floating solids at any time.

e. The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand. The percent removal shall be based on monthly average values.

f. 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.

g. The permittee shall minimize the use of chlorine while maintaining adequate bacterial control.

h. The results of sampling for any parameter above its required frequency must also be reported.

2. All POTWs must provide adequate notice to the Director of the following:

a. Any new introduction of pollutants into that POTW from an indirect discharger in a primary industry category discharging process water; and

b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

c. For purposes of this paragraph, adequate notice shall include information on:

(1) the quantity and quality of effluent introduced into the POTW; and

(2) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

3. Prohibitions Concerning Interference and Pass Through:

a. Pollutants introduced into POTW's by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

b. If, within 30 days after notice of an interference or pass through violation has been sent by EPA to the POTW, and to persons or groups who have requested such notice, the POTW fails to commence appropriate enforcement action to correct the violation, EPA may take appropriate enforcement action.

4. Toxics Control

a. The permittee shall not discharge any pollutant or combination of pollutants in toxic amounts.

b. Any toxic components of the effluent shall not result in any demonstrable harm to aquatic life or violate any state or federal water quality standard which has been or may be promulgated. Upon promulgation of any such standard, this permit may be revised or amended in accordance with such standards.

5. Numerical Effluent Limitations for Toxicants

EPA or DEP may use the results of the toxicity tests and chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to

Section 304(a)(1) of the Clean Water Act (CWA), state water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants, including but not limited to those pollutants listed in Appendix D of 40 CFR Part 122.

B. PRETREATMENT

1. Limitations for Industrial Users:

a. Pollutants introduced into POTW's by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

2. Industrial Pretreatment Program

Within 120 days of the effective date of the permit, the permittee shall submit the results of an industrial user survey including identification of industrial users and the character and volume of pollutants contributed to the Publicly Owned Treatment Works (POTW) by the industrial users. The industrial user survey shall as a minimum include the following :

(i) Industries discharging wastes which are or may be in the future subject to local limitations or the national prohibited discharge standards found in 40 CFR Part 403.5; and

(ii) Industries discharging wastewater from processes in one or more primary industry categories (See Appendix A to 40 CFR Part 122 or Appendix C of 40 CFR Part 403).

C. UNAUTHORIZED DISCHARGES

The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from outfalls listed in Part I A.1. of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs) are not authorized by this permit and shall be reported in accordance with Section D.1.e. (1) of the General Requirements of this permit (Twenty-four hour reporting).

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. Preventative Maintenance Program

The permittee shall maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges.

3. Infiltration/Inflow Control Plan:

The permittee shall develop and implement a plan to control infiltration and inflow (I/I) to the separate sewer system. The plan shall be submitted to EPA and MA DEP within six months of the effective date of this permit (see page 1 of this permit for the effective date) and shall describe the permittee's program for preventing infiltration/inflow related effluent limit violations, and all unauthorized discharges of wastewater, including overflows and by-passes due to excessive infiltration/inflow.

The plan shall include:

- An ongoing program to identify and remove sources of infiltration and inflow. The program shall include the necessary funding level and the source(s) of funding.

- An inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts. Priority should be given to removal of public and private inflow sources that are upstream from, and potentially contribute to, known areas of sewer system backups and/or overflows.

- Identification and prioritization of areas that will provide increased aquifer recharge as the result of reduction/elimination of infiltration and inflow to the system.

- An educational public outreach program for all aspects of I/I control, particularly private inflow.

Reporting Requirements:

A summary report of all actions taken to minimize I/I during the previous calendar year shall be submitted to EPA and the MA DEP annually, by the anniversary date of the effective date of this permit. The summary report shall, at a minimum, include:

- A map and a description of inspection and maintenance activities conducted and

corrective actions taken during the previous year.

- Expenditures for any infiltration/inflow related maintenance activities and corrective actions taken during the previous year.

- A map with areas identified for I/I-related investigation/action in the coming year.

- A calculation of the annual average I/I, the maximum month I/I for the reporting year.

- A report of any infiltration/inflow related corrective actions taken as a result of unauthorized discharges reported pursuant to 314 CMR 3.19(20) and reported pursuant to the Unauthorized Discharges section of this permit.

4. Alternate Power Source

In order to maintain compliance with the terms and conditions of this permit, the permittee shall continue to provide an alternative power source with which to sufficiently operate its treatment works (as defined at 40 CFR §122.2).

5. Nitrogen Removal Optimization Study

The permittee shall complete a Nitrogen Removal Optimization Study within 18 months of the effective date of the permit. A scope of work for completing the study shall be submitted to EPA and MADEP within 3 months of the effective date of the permit. The study shall assess current and future wastewater flows and nitrogen loadings, identify alternatives for controlling influent average and/or peak nitrogen loadings, evaluate the nitrogen removal performance of the treatment facility, and determine operational criteria for achieving the maximum practicable removal of nitrogen at the existing treatment facility. Within one month, following EPA and DEP approval of the study, the recommendations of the study shall be implemented, and the treatment plant operational processes operated to optimize removal of nitrogen, consistent with the recommendations of the study.

E. SLUDGE CONDITIONS

1. The permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices and with the CWA Section 405(d) technical standards.

2. The permittee shall comply with the more stringent of either the state or federal (40 CFR part 503), requirements.

3. The requirements and technical standards of 40 CFR part 503 apply to facilities which perform one or more of the following use or disposal practices.

   a. Land application - the use of sewage sludge to condition or fertilize the soil

   b. Surface disposal - the placement of sewage sludge in a sludge only landfill

   c. Sewage sludge incineration in a sludge only incinerator

4. The 40 CFR part 503 conditions do not apply to facilities which place sludge within a municipal solid waste landfill. These conditions also do not apply to facilities which do not dispose of sewage sludge during the life of the permit but rather treat the sludge (lagoons- reed beds), or are otherwise excluded under 40 CFR 503.6.

5. The permittee shall use and comply with the attached (see Attachment B) compliance guidance document to determine appropriate conditions. Appropriate conditions contain the following elements.

   - General requirements
   - Pollutant limitations
   - Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
   - Management practices
   - Record keeping
   - Monitoring
   - Reporting

   Depending upon the quality of material produced by a facility, all conditions may not apply to the facility.

6. The permittee shall monitor the pollutant concentrations, pathogen reduction and vector attraction reduction at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year

less than 290	1/ year
290 to less than1500	1 /quarter
1500 to less than 15000	6 /year
15000 +	1 /month

7. The permittee shall sample the sewage sludge using the procedures detailed in 40 CFR 503.8.

8. The permittee shall submit an annual report containing the information specified in the guidance **by February 19.** Reports shall be submitted to the address contained in the

reporting section of the permit. Sludge monitoring is not required by the permittee when the permittee is not responsible for the ultimate sludge disposal. The permittee must be assured that any third party contractor is in compliance with appropriate regulatory requirements. In such case, the permittee is required only to submit an annual report on February 19 containing the following information:

- Name and address of contractor responsible for sludge disposal
- Quantity of sludge in dry metric tons removed from the facility by the sludge contractor

F. MONITORING AND REPORTING

1. Reporting

Monitoring results obtained during each calendar month shall be summarized and reported on Discharge Monitoring Report Form(s) postmarked no later than the 15th day of the following month.

Signed and dated originals of these, and all other reports required herein, shall be submitted to the Director and the State at the following addresses:

Environmental Protection Agency
Water Technical Unit (SEW)
P.O. Box 8127
Boston, Massachusetts 02114

The State Agency is:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection
Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02347

Signed and dated Discharge Monitoring Report Forms and toxicity test reports required by this permit shall also be submitted to the State at:

Massachusetts Department of Environmental Protection
Division of Watershed Management
Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, Massachusetts 01608

G. STATE PERMIT CONDITIONS

This Discharge Permit is issued jointly by the U. S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (DEP) under Federal and State law, respectively. As such, all the terms and conditions of this permit are hereby incorporated into and constitute a discharge permit issued by the Commissioner of the MA DEP pursuant to M.G.L. Chap.21, §43.

Each Agency shall have the independent right to enforce the terms and conditions of this Permit. Any modification, suspension or revocation of this Permit shall be effective only with respect to the Agency taking such action, and shall not affect the validity or status of this Permit as issued by the other Agency, unless and until each Agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this Permit is declared, invalid, illegal or otherwise issued in violation of State law such permit shall remain in full force and effect under Federal law as an NPDES Permit issued by the U.S. Environmental Protection Agency. In the event this Permit is declared invalid, illegal or otherwise issued in violation of Federal law, this Permit shall remain in full force and effect under State law as a Permit issued by the Commonwealth of Massachusetts.

Appendix D
Fairhaven WPCF Hydraulic Profile

(Separate PDF File)

Appendix E
WPCF Conditions Survey Database

(Separate PDF File)

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(Separate PDF File)