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August 31, 2009

Mr. Gary Basilesco
US Power Generating Company - Mystic Station
173 Alford Street
Boston, MA 02129-1032

Re: RCRA Facility Assessment
Mystic Station
173 Alford Street
Boston, MA

Dear Mr. Basilesco:

Enclosed is one copy of the RCRA Facility Assessment for the Mystic Station. The RCRA Facility Assessment identified some data gaps where additional information is required. Provided that existing information is not available to address these data gaps, additional investigation may be warranted to adequately assess the facility. Should you have additional supporting information or questions regarding the RCRA Facility Assessment, please respond to EPA and M&A.

Very truly yours,

MABBETT & ASSOCIATES, INC.

BY:

James R. Greacen, LSP
Director, Site Assessment and Restoration

/tw

Enclosure: *RCRA Facility Assessment – Mystic Station, August 31, 2009* (1 Copy) and 1 CD

cc: Juan Perez, US EPA (1 copy and CD)
Gregg McBride, GZA (1 copy)
James Chow w/o encl.
Rosanne Sawaya-O'Brien w/o encl.
(MF)

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RCRA FACILITY ASSESSMENT REPORT

Mystic Station
173 Alford Street
Boston, MA
MAD000842401

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
U.S. Environmental Protection Agency
Region I - New England
1 Congress Street, Suite 1100 (HBT)
Charlestown, MA 02114-2023

Task Order No.: R01012
Contract No.: EP-W-07-051

August 31, 2009

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TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY 1
2.0 INTRODUCTION 7
2.1 Regulatory History 7
2.2 RFA Objectives 7
2.3 File Review 7
2.4 Visual Site Inspection 8
3.0 FACILITY DESCRIPTION 9
4.0 DESCRIPTION OF FACILITY ACTIVITIES AND HISTORY 11
4.1 Electricity Generation 11
4.2 Waste Management Practices 11
4.3 Regulatory History 18
5.0 ENVIRONMENTAL SETTING 21
5.1 Facility Land Use 21
5.2 Topography and Surface Water 21
5.3 Geology and Hydrogeology 22
5.4 Groundwater Monitoring History 23
6.0 SWMU AND AOC DESCRIPTIONS 25
6.1 Solid Waste Management Units 26
SWMU 1 - Oil Separator Pit/Former 1,000-gallon Waste Oil UST 26
SWMU 2 - RTN 3-10431 (Waste Treatment Plant Storage Tank Farm) 28
SWMU 3 – Former Wastewater Surface Impoundments 30
SWMU 4 – Former and Current Wastewater Treatment System 31
SWMU 5 – Former Coal Ash Pile 33
SWMU 6 – Fly Ash Storage Basin 34
6.2 Areas of Concern 35
AOC 1 - Unit 7 Transformer Area 35
AOC 2 - Unit 4 Building, Stained Areas 37
AOC 3 - Abandoned Sump Outside Unit 3 38
AOC 4 - RTN 3-12422 (Exxon/Facility No. 6 Fuel Oil Pipeline) 39
AOC 5 - Abandoned Underground Storage Tanks – Locations Unknown 40
AOC 6 - Spill of Unknown Location 41
AOC 7 – RTN 3-0923 and Related Releases at Mystic 8&9 Development Area 42
AOC 8 – Releases at Tank 1 and Tank 2 (RTN 3-12140 and RTN 3-17789) 48
AOC 9 - Former Fly Ash Storage Basin Pump Room 52
AOC 10 - RTN 3-19849 53
AOC 11 - RTN 3-22499 Ignition Oil Spill 55
AOC 12 - RTN 3-17387 56
AOC 13 - Tetrachloroethylene in Groundwater 57
AOC 14 - Former Transformers 1, 2, 3, 4, 5, 6 and 11 59
AOC 15 – RTN 3-13744 62
AOC 16 – RTN 3-17445 63
AOC 17 – RTN 3-22934 65
AOC 18 – RTN 3-22863 67
AOC 19 – RTN 3-20199 69
7.0 REFERENCES 73

TABLE OF CONTENTS
(Continued)

TABLES

Table 1 – Solid Waste Management Units 4
Table 2 – Areas of Concern 5

FIGURES

Figure 1 – Site Location Map
Figure 2 – Site Plan
Figure 3 – SWMU Map
Figure 4 – AOC Map

ATTACHMENTS

Attachment 1 – Solid Waste Management Unit (SWMU) and Area of Concern (AOC) List
Attachment 2 – Photographic Log
Attachment 3 – Sanborn Maps

ACRONYMS

AOC – Area of Concern
AST – Aboveground Storage Tank
BGS – Below Ground Surface
CFR – Code of Federal Regulations
CS – Confirmatory Sampling
EPIC – Environmental Photographic Interpretation Center
EPA – U.S. Environmental Protection Agency
EPH – Extractable Petroleum Hydrocarbons
IRA – Immediate Response Action
LNAPL – Light Non-Aqueous Phase Liquid
M&A – Mabbett & Associates, Inc.
MassDEP – Massachusetts Department of Environmental Protection
MCP – Massachusetts Contingency Plan
MODF –Mineral Oil Dielectric Fluid
NFA – No Further Action
NPDES - National Pollution Discharge Elimination
PAHs – Polynuclear Aromatic Hydrocarbons
PCB – Polychlorinated Biphenyl
POTW - Publicly-Owned Treatment Works
ppb – Parts per billion
ppm – Parts per million
PR – Preliminary Review
RAE – Remedial Alternative Evaluation
RAM – Release Abatement Measure
RAO – Response Action Outcome
RCRA – Resource Conversation and Recovery Act
RFA – RCRA Facility Assessment
RFI – RCRA Facility Investigation
RIP – Remedy Implementation Plan
SWMU – Solid Waste Management Unit
TPH – Total Petroleum Hydrocarbons
URAM – Utility Release Abatement Measure
UST – Underground Storage Tank
VSI – Visual Site Inspection

1.0 EXECUTIVE SUMMARY

The first step in the Resource Conservation and Recovery Act (RCRA) corrective action process is the RCRA Facility Assessment (RFA). The RFA is conducted to assess whether a release of hazardous waste or hazardous constituents has occurred from solid waste management units (SWMUs) and to identify potential areas of concern (AOCs). The main components of an RFA are to identify and gather information on releases at a facility; to evaluate SWMUs for releases to all media (groundwater, surface water, air, and soil); and to make preliminary determinations regarding releases of concern and the need for further action and interim measures.

An RFA is currently being conducted at the Mystic Station (herein the "Facility") located at the above-referenced address in Boston, Massachusetts. Although the Facility address is Charlestown, Charlestown is a borough of Boston. Furthermore, the majority of the property is located in Everett, Middlesex County, Massachusetts. In September 2008, Mabbett & Associates, Inc. (M&A) acquired information regarding the Facility from publically-accessible files located at the offices of the U.S. Environmental Protection Agency (EPA) Region 1 and Massachusetts Department of Environmental Protection (MassDEP). Following the acquisition of the files, M&A completed a preliminary review of this information to develop an understanding of the Facility history and the presence of specific SWMUs and AOCs. On October 22, 2008, M&A completed and submitted a Preliminary Review (PR) report to the EPA and representatives with US Power Generating Company (USPowerGen), the current owner of the Facility. On December 10, 2008, a visual site inspection (VSI) of the Facility was conducted by M&A and EPA to address information gaps identified in the PR, identify and document information associated with the SWMUs and AOCs, and meet Facility representatives to obtain additional information. This RFA summarizes the combined findings of the PR, the VSI, and information obtained from files located at the Facility. Finally, the RFA provides recommendations regarding potential RCRA activities.

The Facility is an active electric power generating station and is located at 173 Alford Street, City of Boston, Suffolk County, Massachusetts (Ref. SM-02). However, the majority of the Facility is located in Everett, Middlesex County, Massachusetts. The geographic coordinates of the Facility are 42°23'30" latitude and 71°04'00" longitude. The Facility is abutted to the south by the Mystic River, to the west by Alford Street, to the north by Dexter, Robin and Rover Streets, and to the east by Prolerized New England (a metals recycling facility) (Ref. SM-46). A Site Location Map and a Site Plan are provided as Figures 1 and 2, respectively.

The Facility is situated on approximately 75 acres, of which 17 acres are located under water in the Mystic River, adjacent to the Facility (Ref. SM-19). The Facility includes two distinct electricity generation areas. The first area, known as Mystic I, consists of a 600 megawatt (MW) steam-powered turbine (designated as "Unit 7") that utilizes a boiler fueled by No. 6 fuel oil and/or natural gas. This area also includes decommissioned, former turbine areas known as Units 1 through 6. Mystic I occupies a majority of the western portion of the Facility. The second area, known as Mystic Station 8&9, is a 1,550 MW natural-gas-fired combined cycle power plant equipped with four combustion turbine generators, four heat recovery steam

generators, two steam turbine generators, and two exhaust stacks (Refs. SM-38, SM-42). Mystic 8&9 occupies a majority of the eastern portion of the Facility.

Collectively, the Facility houses a wastewater treatment plant and associated aboveground wastewater storage tanks, a concrete-lined polishing pond, office buildings, a guard house, an electrical switching station, two outdoor electrical transformer yards (one of which is owned by NStar), bulk petroleum aboveground storage tanks, stormwater retention basins, and access docks (Ref. SM-46). The on-shore portion of the Facility not improved by structures is covered with asphalt pavement, crushed stone, and limited landscaping. The Facility is surrounded by a chain-link fence topped with barbed wire, and access to the Facility is controlled by a security guard (Ref. SM-46).

The property has been utilized for electricity generation since November 13, 1943 (Ref. SM-04). According to historical Sanborn Fire Insurance maps dated 1903, 1910, and 1950, the area surrounding the property was developed for industrial purposes, including a bed manufacturer and a gas and fuel company. Prior to 1943 the property was not improved with any structures (Ref. SM-19).

The Facility was initially owned and operated by the Boston Edison Company (BECo), though historical Sanborn maps identify the Facility as being owned and/or operated by the Edison Electric Illuminating Company of Boston (Refs. SM-19; SM-45). At the time, the Facility utilized six coal-fired turbines, referred to as Units 1, 2, 3, 4, 5, and 6. These six turbines were collectively referred to as Mystic I, LLC. In the 1940's, coal piles occupied the eastern portion of the Facility, and an electrical switchyard was constructed on the west side of the Facility. By 1968, the turbines were converted to burn No. 6 fuel oil, and in the same year a combustion jet peaking turbine (Unit No. 7) fueled by No. 6 fuel oil was installed; in 1982 it was converted to also burn natural gas. The No. 6 fuel oil was transferred directly into the Facility via two underground product pipelines extending between above-ground bulk product storage tanks located at the Facility and the supplier, Exxon/Mobil, which was located on the north side of Robin Street (Ref. SM-42). On a date not specified, these underground lines were replaced with above-ground lines on the Facility side of Robin Street. In 1975, underground electrical transmission lines cooled with non-PCB oil were installed between Mystic I and the switchyard and were operated until aboveground cables were installed in 1978.

On an unspecified date, Units 1-6 were decommissioned, and only Unit 7 continued to operate within Mystic I. In 2004, construction was completed on Mystic 8&9 and this station became operational in the same year.

The ownership history of the Facility is summarized below:

- Prior to 1943 – Property owned by Eastern Gas Company and Massachusetts Gas Company (Ref. SM-28)
- 1943 – Facility constructed, owned and operated by Boston Edison Company (BECo)
- May 15, 1998 – BECo sells Facility to Sithe Mystic (Refs. SM-24, SM-28)
- Date unknown – Sithe Mystic sells Facility to Exelon (Ref. SM-32)

- September 1, 2004 – Exelon sells Facility to US Power Generation. Facility operated as two distinct units (Mystic I, LLC and Mystic Development, LLC) (Ref. SM-42).

Wastes generated at the Facility have included corrosive wastewater, oily debris, sludge, petroleum-hydrocarbon combustion by-products (ash), and air emissions. These wastes have been generated as a direct result of operating the electric generation systems. In addition, the historical use of coal as a fuel source resulted in the generation of coal ash at the Facility. Releases of hazardous wastes and petroleum products have been documented at the Facility. As a result, a total of 6 SWMUs and 15 AOCs were identified at the Facility. The names of these SWMUs and AOCs are listed in Attachment 1, and their approximate locations are identified on the SWMU Map in Figure 3 and the AOC Map in Figure 4. In addition, a summary description of the SWMUs and AOCs is provided in Tables 1 and 2, and a more detailed discussion of each SWMU and AOC is provided in Section 6.0.

Table 1 **Solid Waste Management Units**					
SWMU #	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Waste Managed**	**Recommendation**
SWMU 1	Oil Separator Pit/Former 1,000-gallon Waste Oil UST	Waste Oil UST	Early 1980's to no later than 1997.	Waste oil	No further action. Class A-3 RAO issued August 10, 2005.
SWMU 2	RTN 3-10431 (Waste Treatment Plant Storage Tank Farm)	Corrosive wastewater storage tanks	1983 to 2000	Corrosive wastewater	No further action. Class A-1 RAO issued March 14, 1994.
SWMU 3	Former Wastewater Surface Impoundments	Surface impoundments	1982 to 1988	Corrosive wastewater	No further action. Clean closure issued October 19, 1992.
SWMU 4	Former and Current Wastewater Treatment System	Wastewater Treatment System, excluding tanks	1983 to Present	Corrosive wastewater, hazardous chemicals	No further action.
SWMU 5	Coal ash pile	Coal ash storage	1943 to Unknown	Coal ash	RCRA Facility Investigation.
SWMU 6	Fly ash basin	Fly ash accumulation unit	Unknown to Present	Fly ash	No further action.

Table 2 **Areas of Concern**					
AOC #	**AOC Name**	**Type of Unit**	**Period of Operation**	**Waste Managed**	**Release Potential**
AOC 1	Unit 7 Transformer Area	Transformer sump pit	Unknown	Petroleum hydrocarbons	No further action
AOC 2	Unit 4 Building, Stained Areas	Release area	1997	Petroleum hydrocarbons	RCRA Facility Investigation.
AOC 3	Abandoned Sump Outside Unit 3	Acid sump	Unknown	Acids	RCRA Facility Investigation.
AOC 4	RTN 3-12422	No. 6 fuel oil pipeline	Unknown	No. 6 fuel oil	No further action. Class A-2 RAO issued August 28, 1995.
AOC 5	Abandoned Underground Storage Tanks	USTs	1956 through 1994	No. 2 and No. 6 fuel oil	RCRA Facility Investigation.
AOC 6	Spill of Unknown Location	Unknown	1976	Fuel oil	RCRA Facility Investigation.
AOC 7	RTN 3-0923, RTN 3-18553, RTN 3-18717	Bulk No. 6 fuel oil AST (Former Tank 3)	1943 to 2005	No. 6 fuel oil, phthalate	No further action. Class A-3 RAO issues August 10, 2005.
AOC 8	RTN 3-12140, RTN 3-17789	Bulk No. 6 fuel oil AST (Tank Nos. 1 and 2)	Unknown to Present	No. 6 fuel oil	No further action.
AOC 9	Former Fly Ash Storage Basin Pump Room	Release	Unknown up to 1999	Ethylene glycol	No further action.
AOC 10	RTN 3-19849	Unit 4 Building	Unknown	No. 6 fuel oil	No further action. Class A-1 RAO issued July 14, 2001.
AOC 11	RTN 3-22499	Paved road surface	2003	No. 2 fuel oil	No further action. Class A-1 RAO issued March 21, 2003.

Table 2 **Areas of Concern**					
AOC #	**AOC Name**	**Type of Unit**	**Period of Operation**	**Waste Managed**	**Release Potential**
AOC 12	RTN 3-17387	Containment berm	Unknown to Present	No. 2 fuel oil	No further action. Class A-1 RAO issued December 7, 1998.
AOC 13	Tetrachloroethylene in Groundwater	Groundwater	Unknown	Tetrachloroethylene	RCRA Facility Investigation.
AOC 14	Former Transformers 1, 2, 3, 4, 5, 6 and 11	Transformers	Unknown to 1989 and early 1990's	PCB	RCRA Facility Investigation.
AOC 15	RTN 3-13744	Hydraulic oil release to the Mystic River	Unknown	Hydraulic oil	No further action. Class A-1 RAO issued July 10, 1996.
AOC 16	RTN 3-17445	Sulfuric acid release to soil	1998	93.7% sulfuric acid	No further action. Class A-2 RAO issued December 16, 1998.
AOC 17	RTN 3-22934	Electrical substation	2003	No-PCB MODF	No further action. Class A-2 RAO issued June 23, 2003
AOC 18	RTN 3-22863	Electrical substation	2003	No-PCB MODF	No further action. Class A-2 RAO issued May 28, 2003
AOC 19	RTN 3-20199	Electrical substation	Unknown to Present	PCB and MODF	RCRA Facility Investigation.

2.0 INTRODUCTION

2.1 Regulatory History

The 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) provide authority in the RCRA program to assist the U.S. Environmental Protection Agency (EPA) in implementing corrective action at RCRA facilities. RCRA facilities include all facilities that currently treat, store, or dispose of hazardous waste, or have done so in the past, as regulated under RCRA. The first step in the RCRA corrective action process is the RCRA Facility Assessment (RFA).

2.2 RFA Objectives

The RFA is being conducted to assess whether a release of hazardous waste or hazardous constituents has occurred from Solid Waste Management Units (SWMUs) and to identify potential Areas of Concern (AOCs) at the Facility. A SWMU is defined as any discernable waste management unit at a RCRA Facility from which hazardous constituents might migrate, irrespective of whether the unit was intended for management of solid and/or hazardous waste. An AOC is an area where evidence of spills or other releases of waste have occurred resulting from waste management activities that may not fit the definition of a SWMU.

Under Work Assignment No. R01012, EPA Region 1 requested M&A to conduct an RFA at the Facility. The specific objectives of this RFA are to:

- Identify all SWMUs and AOCs located at the Facility;

- Perform a PR of file material and conduct a VSI to assess the potential for the release of hazardous wastes or hazardous constituents from each SWMU and AOC;

- Make preliminary determinations regarding releases of concern and the need for further actions, including confirmatory sampling (CS), RCRA Facility Investigations (RFIs) and/or interim measures (IMs), for each SWMU and AOC at the Facility.

2.3 File Review

The acquisition of publically accessible files located at the offices of EPA Region 1 and Massachusetts Department of Environmental Protection (MassDEP) for the Facility was completed by M&A in September 2008. Subsequently, M&A completed a PR of the file material in September 2008 to develop an understanding of the Facility operation in advance of the VSI. A list of files used to prepare this report is provided in Section 7.0. This list also includes the files obtained during the VSI.

The PR identified past and current waste management practices involving waste generation, treatment, and storage and/or disposal at the Facility. The PR also included a review of other activities and areas, not involving waste, which may have exhibited a potential for releasing contaminants to the environment (e.g., drum, raw materials, or product storage areas, fuel storage or transfer areas, and other areas of reported contamination). As a result of the PR, a preliminary list of SWMUs and AOCs was generated and used to plan the VSI. In addition, the PR identified information gaps to be clarified during the VSI to fully assess the potential for releases from SWMUs and impacts from AOCs.

2.4 Visual Site Inspection

The purpose of a VSI is to conduct an on-site assessment to address information gaps identified during the PR, identify and document information associated with all SWMUs and AOCs identified in the PR, and identify any additional SWMUs and AOCs at the Facility.

On December 10, 2008, a five-person team (Juan Perez and Frank Battaglia with EPA Region 1, and Jamie Greacen, Kiran Sears, and Andrew Glucksman with M&A) attended an introductory meeting with Facility representatives. The primary Facility participants were Gary Basilesco and Melvin Parker with USPowerGen and Greg McBride with GZA, Inc. (GZA), an environmental consultant contracted to USPowerGen. Following the meeting, M&A personnel conducted the VSI with oversight by Mr. Perez. Following the VSI, M&A personnel reviewed relevant file materials archived at the Facility (Ref. SM-46).

3.0 FACILITY DESCRIPTION

Current Facility Features

The Facility is an active electric power generating station located at 173 Alford Street, City of Boston, Suffolk County, Massachusetts. The geographic location of the Facility is latitude 42°23'30" and 71°04'00" longitude. The Facility is situated on approximately 75 acres, of which 17 acres are reportedly under water in the Mystic River (Ref. SM-19). The location of the Facility is shown on Figure 1. The Facility is abutted to the south by the Mystic River, to the west by Alford Street, to the north by Dexter, Robin and Rover Streets, and to the east by Prolerized New England (a metals recycling facility) (Ref. SM-46). A public recreational field is located across Dexter Street to the north of the Facility property, while the nearest residential dwellings are approximately 900 feet to the north of the Facility, along Lynde Street.

The Facility includes two distinct electricity generation areas. The first area, known as Mystic I, includes a 600 megawatt (MW) steam-powered turbine (designated as "Unit 7") that utilizes a boiler fueled by No. 6 fuel oil and/or natural gas. Mystic I occupies approximately 41 acres the western portion of the Facility. The second area, known as Mystic Station 8 & 9, is a 1,550 MW natural-gas-fired combined cycle power plant equipped with four combustion turbine generators, four heat recovery steam generators, two steam turbine generators, and two exhaust stacks (Refs. SM-38, SM-42). Mystic 8&9 occupies approximately 17 acres on the eastern portion of the Facility.

As a whole, the Facility includes the two power generation areas, a wastewater treatment plant and above-ground wastewater holding tanks within secondary containment, a concrete-lined polishing pond and clarifier, office buildings, a guard house, an electrical switching station, an outdoor electrical transformer yard, three bulk petroleum storage tanks and associated secondary containment structures, a sludge accumulation containment area, four stormwater retention basins and four outfalls (one for Unit 7 cooling water, one for wastewater discharge, and two for stormwater discharge) into the Mystic River, and access docks along the Mystic River (Ref. SM-46). There are a total of seven stacks at the Facility: one for Unit 7 and two for Mystic 8&9, while the remaining three stacks are associated with Units 1-6. The on-shore portion of the Facility not improved by structures is covered with asphalt pavement, crushed stone, and limited landscaping. The Facility is surrounded by a chain-link fence topped with barbed wire, and access to the Facility is controlled by a security guard.

Historical Facility Features

Sanborn Fire Insurance maps dated 1903, 1910, 1950, 1955, 1970 and 1972 indicate that the area surrounding the Facility was developed for industrial purposes, including a bed manufacturer and a gas and fuel company (Refs. SM-19, SM-46). Prior to 1943 the property was not improved with any structures (Ref. SM-19).

An EPA Environmental Photographic Interpretation Center (EPIC) analysis was performed in 1987 of aerial photographs taken in 1943, 1955, 1969, 1979 and 1986 (Ref. SM-07). A summary of the EPIC findings are presented in the following list:

- The 1943 photograph shows the Facility under construction. The EPIC analysis identified a very large coal pile present on the eastern portion of the Facility. This coal pile would have been used in the coal-fired boilers inside Units 1-6. Furthermore, mounded materials (source of material not identified) are present on the northwestern corner and northern portion of the Facility in the area currently occupied by the outdoor electrical substation.

- The 1955 photograph depicts several new buildings at the Facility. A large coal pile is present in the center of the Facility in an area where a pit was visible in the 1943 photograph. The mounded material on the northwestern portion of the Facility has been replaced with a new paved lot.

- The 1969 photograph depicts several new buildings at the Facility, while others have been removed. A total of 31 vertical tanks are visible, with the majority located in the southeastern corner of the Facility. No coal piles were identified, though mounded material remains in the northern portion of the Facility.

- The 1979 photograph depict two surface impoundments in the northeast portion of the Facility and several new tanks (a total of 44 tanks are present), including two large No. 6 fuel oil storage tanks and associated secondary containment. In addition, the Unit 7 building is present. A coal pile and debris are present in the northeast corner of the Facility. Stained areas and debris is visible to the east of the Tank No. 4.

- The 1986 photograph depicts the addition of the new surface impoundment in the northeast portion of the Facility. The one surface impoundment visible in the 1979 photo has been replaced with three (now former) surface impoundments (SMWU 3). An impoundment visible in the approximate center of the Facility in the 1979 photo is no longer present in the 1986 photo. A clarifier and another impoundment are present in the southern portion of the Facility.

Several of these historical features on the 1986 photograph are present at the Facility today, including the generation buildings and selected wastewater treatment systems. However, since the most recent EPIC photo dated 1986, many features have changed at the Facility, including the removal of the three northwest surface impoundments, removal of the AST farm in the southeast corner, removal of the railroad, and the construction of Mystic 8&9.

4.0 DESCRIPTION OF FACILITY ACTIVITIES AND HISTORY

Information used to develop the following discussion of historical and current Facility operations was obtained from a number of reports prepared by Federal and State agencies, environmental consultants, Facility owners/operators, and observations made during the VSI.

4.1 Electricity Generation

The Facility has been utilized for electricity generation since November 13, 1943 (Ref. SM-19). As previously described, generation activities have utilized coal, No. 6 fuel oil, and natural gas. As such, the Facility has generated waste streams that are unique to each specific fuel source, as well as waste that is independent of the fuel source, such as corrosive boiler-side wastewater. These waste streams and management practices are described in detail in Section 4.2.

In addition to the generation activities, the Facility also houses an outdoor electrical distribution substation on the north/northwestern and western portions of the Facility. Some of the electrical equipment located within the substation is owned by NStar, an electrical distribution company.

4.2 Waste Management Practices

Wastes generated at the Facility have included corrosive wastewater, oily debris, sludge, petroleum-hydrocarbon combustion by-products (ash), and air emissions. These wastes have been generated as a direct result of operating the electric generation systems. In addition, the historical use of coal as a fuel source resulted in the generation of coal ash at the Facility. The following sections describe each waste stream and the accompanying waste management practices.

Wastewater

Currently, wastewater is generated in the power plants (Unit 7 and Mystic 8&9) from external equipment washes, equipment and floor drains, chemical cleaning and boiler blowdown, equalization tank area sump, and air preheater and boiler fireside washes (Ref. SM-36). The wastewater is defined as a hazardous substance due to its corrosive nature and typically has contained entrained, suspended and dissolved solids, such as fly ash, soda ash, iron and copper. As such, a wastewater treatment system is utilized to neutralize the water, settle out solids (sludge), and discharge the treated water to the City of Everett municipal sewer system under Sewer Use Discharge Permit #39 102507, which was issued on August 11, 2005 (Ref. SM-38). Approximately 90,000 gallons of treated water is discharged daily (Ref. SM-38). Sanitary waste is discharged to the sewer system at an approximate volume of 1,250 gallons per day.

The current wastewater treatment system involves a wastewater flow equalization tank farm (three fiber-reinforced plastic tanks with a total capacity of 1.9 million gallons) and an oil/water separator (described in the following section) (Ref. SM-36). Wastewater enters the tanks and is discharged at a controlled rate (maximum of 600 gallons per minutes) into the treatment plant. The treatment process involves pH adjustment/precipitation, aeration and mixing, coagulation,

clarification (in an outdoor concrete-lined pond), sludge dewatering and final pH adjustment/neutralization (Ref. SM-36). The chemicals used to treat the waste water include aqueous ammonia stored in two 100,000 gallon tanks, sulfuric acid (8,000 gallon tank), caustic (8,000 gallon tank), sodium chloride (8,000 gallon tank), propylene glycol in two 3,000 gallon tanks, and GT wash chemicals, biocides and laboratory chemicals in two 4,000 gallon totes for each chemical, sodium bisulfate (100 gallon tote), phosphate solution in two 250-gallon totes, and sodium hypochlorite in 5-gallon containers (Ref. SM-36). All of these chemicals are stored in within 110% secondary containment structures. Maintenance chemicals, such as degreasers, parts cleaner, and paints are stored within secondary containment in the maintenance shop area.

Historically, from January 1983 through 1988, corrosive wastewater was treated in three surface impoundments located on the north central portion of the Facility (Refs. SM-03, SM-12). The surface impoundments and subsequent closure are discussed in greater detail the following section and under SWMU 3. The wastewater was hazardous because it was corrosive in nature (approximately 10% strength acid solution [Ref. SM-05]). The surface impoundments were closed in 1988 and the MassDEP issued a "Clean Closure" letter on October 19, 1992 (SM-14). Mystic 8&9 was subsequently constructed over a portion of the former surface impoundments. As such, no visible evidence of the former surface impoundments was observed during the VSI. In addition to the former surface impoundments, from 1983 through 2000, the Facility utilized a former above-ground tank farm for wastewater equalization. The tanks had a combined capacity of 931,362 gallons and were located in the eastern portion of the Facility in the (current) footprint of Mystic 8&9. In 2000, the tanks were removed from service and replaced with the current system of above-ground storage tanks, which are located adjacent to the wastewater treatment building and within secondary containment.

Detailed information about wastewater management practices prior to 1982 is not available in the file material or from Facility representatives. It is known that wastewater treatment operations have taken place since 1975 (Ref. SM-05). Based on the EPIC photographs dated 1979, a surface impoundment was constructed in the northeast portion of the property between 1969 and 1979. Additional information about this impoundment was not available in the file material. Furthermore, the 1955 and 1969 EPIC photographs depict an active outfall from the southwestern portion of the Facility into the Mystic River (Ref. SM-07). No information was available in the file material indicating whether the outfall was for the discharge of wastewater from the Facility.

Former Surface Water Impoundment Closure

The Exposure Information Report of the revised Part A Application included information about the surface impoundment design (Ref. SM-04). Specifically, the three surface impoundments were constructed with a 45-mil Hypalon liner (consisting of two single Hypalon sheets bonded to a synthetic undersheet), a leachate detection/collection system, a bentonite clay liner, and a groundwater monitoring system (Ref. SM-04). The impoundments were used to segregate primary wastewaters (which required different degrees of treatment), equalize chemical concentration fluctuations and hydraulic loadings to downstream treatment equipment, and receive recycled wastewater that did not meet the NPDES limitations.

Pond No. 1 had a total capacity of 1,600,000 gallons and received boiler fireside and air preheater washing wastes and boiler blowdowns with elevated iron concentrations. Pond No. 2

was 1,233,000 gallons in capacity and received floor drain and equipment drain wastes. Pond No. 3 was 393,000 gallons in capacity and received boiler chemical cleaning wastes and used the discharge pump to recirculate/mix the chemical cleaning wastes. Detected leachate was diverted to a collection sump located inside the former pump house.

The total capacity of the impoundments was 3,216,000 gallons of wastewater including two feet of freeboard capacity. The impoundments were placed in use in January 1983. Based on the volume of wastewater processed daily (864,000 gallons), the Facility determined that 25,500 tons of corrosive waste was generated annually. The wastes entering the surface impoundments were considered corrosive because the pH may have been less than 2.0 or greater than 12.5, as specified at the time under 310 CMR 30.123.

Prior to entering the surface impoundments, untreated wastewater was passed through an oil/water separator. Once in the surface impoundments, the waste was neutralized due to dilution (approximately 10% strength acid solution). The treated wastewater characteristics in the impoundments included total suspended solids at 100-15,000 ppm, pH at 2-12.5, iron at 1,000-4,000 ppm, copper at 200-400 ppm, sulfuric acid at 6%, sodium hydroxide at 4%, calcium hydroxide at 500-1,000 ppm, hydrochloric acid at 2-4%, and ammonia at 0.5% (Ref. SM-04). Once in the surface impoundments, the waste was pumped to the Waste Treatment Building at a maximum flow rate of 600 gallons per minute where the wastewater passed through a clarifier/thickener, then a polishing pond, and finally was discharged into the Mystic River via a single outfall. Sludge that had accumulated in the surface impoundments was reportedly routinely tested as non-hazardous (no data was provided in the file).

The Facility requested and received on October 31, 1985, a MassDEP waiver from interim status groundwater monitoring requirements under 40 CFR 265.09(e) (Refs. SM-03, SM-04). On December 9, 1985, the Facility informed the MassDEP of a leak at the toe seam of the Hypalon liner of Pond No. 2 (Ref. SM-06). The leak rate was approximately 96 gallons per day, as determined by the leak detection system. The surface impoundment was drained and two attempts to identify the leak area were performed by Encore Builders and Weston Geophysical (Ref. SM-08). The studies were inclusive and a visual “inch-by-inch” inspection was performed. In February 1986, the surface impoundment was returned to service. The MassDEP directed the Facility to conduct groundwater monitoring in the vicinity of the surface impoundment. Seven monitoring wells were sampled on March 27, 1986; groundwater well construction details were not available in the file material. Laboratory analysis of collected groundwater samples indicated elevated concentrations of manganese, sodium, chlorine and sulfate; concentration data were not available in the file material.

On June 26, September 24 and December 18, 1986, MassDEP inspected the Facility for RCRA violations (Ref. SM-06). During each inspection, MassDEP noted that a small leak was present in the liner of surface impoundment No. 2. On February 23, 1987, the Facility determined that the leak rate had increased (new rate not reported). As a result, Pond No. 2 was taken out of service on the same day.

On March 20, 1987, MassDEP issued a Notice of Non-Compliance (NON) regarding the leak and inadequate resolution, as well as a Notice of Non-Compliance regarding groundwater monitoring and the lack of clearly defined groundwater flow underlying the Facility (Ref. SM-06). The Facility disputed both NON letters on April 17, 1987, stating that the leak in surface

impoundment No. 2 was a *de minimis* trickle (approximately 96 gallons per day) and was contained by the bentonite clay liner and the leachate collection system, and that the wastewater pH was between 2 and 12. Furthermore, leachate samples were analyzed for VOCs and the data were provided to MassDEP (the data were not present in the file material, but based on the Facility letter, it can be concluded that VOCs were not detected in the leachate).

On February 23, 1987, the Facility informed MassDEP that the leakage rate had increased and that impoundment No. 2 was removed from service while the leak could be located and repaired (Ref. SM-06). On April 2, 1987, an electrical conductive test was performed on the liner and revealed several leaks along the toe seam. There is no information in the file material indicating whether the impoundment was ever returned to service; all three surface impoundments were closed in 1988.

On October 2, 1988, Wehran Engineers reported the results of a preliminary inspection of the Facility conducted under the MassDEP FIT contract (Ref. SM-08). The report noted that a number of historical releases had occurred at the Facility and recommended that soil and groundwater samples be collected to assess the impact of these releases. Specifically, sampling was recommended to assess releases from the transformer station, fuel oil transfer pipelines, and the surface impoundments. The report also confirmed that treated wastewater was discharged to the Mystic River under the NPDES Permit MA0004740. The report concluded that the Facility "is probably contaminated from past releases of hazardous waste, and may be further contaminated from the continual release of wastewater from [surface impoundment] Pond No. 2." Furthermore, the report recommended that more information should be obtained regarding the nature and extent of "ash in the storage silos; metal hydroxide sludge; ash in the precipitator ash accumulation area and holding basin; and oily waste at the drum accumulation area."

In 1988, the surface impoundments were eventually closed. (Prior to closure of the surface impoundments, in 1983 a series of above-ground tanks with a combined capacity of 931,362 gallons was installed in the eastern portion of the Facility. The tanks were used for wastewater equalization. In 2000, the tank farm was replaced with the current above-ground wastewater holding tanks, as previously described [Ref. SM-12]). As such, a surface impoundment closure plan was submitted to MassDEP in 1989 (Ref. SM-11). On February 24, 1989, MassDEP conditionally approved the closure plan (Ref. SM-12). The closure plan was resubmitted in May 1989, and MassDEP approved the revised closure application on September 14, 1989. The approval letter specified the soil and groundwater criteria needed to achieve "clean closure" (Ref. SM-12). In addition, MassDEP indicated that groundwater quality from upgradient locations must be compared to down gradient locations, and that MassDEP groundwater Maximum Contaminant Levels (MCL) would be used to assess groundwater quality.

In September 1989, ABB conducted the first round of soil sampling in the vicinity of the surface impoundments, and the data were reported in a Closure Performance Report in April 1990 (Ref. SM-11). On June 8, 1990, MassDEP provided comments to the Closure Performance Report, as well as allowing for the continuation of closure activities with the exception of backfilling, to which the Facility responded with a Closure Performance Report Addendum No. 1 in July 1990.

Between June 13, 1990, and July 16, 1990, the Facility dismantled the surface impoundments. The primary closure activities involved removing the liners (Refs. SM-11, SM-12). During removal of the liners, an inspection by MassDEP representatives concluded that soils beneath the

liners were visibly stained and that the underlying soil was potentially contaminated. Furthermore, it was later reported that the liner of surface impoundment No. 2 did leak (Refs. SM-06, SM-12). The stained soil areas were subsequently excavated (volume not reported), and in June and July of 1990, under MassDEP oversight, ABB collected soil samples from the sides and/or bottom of each excavation for VOCs (Method 8240 TCL) and 15 selected inorganic compounds. In addition, soil samples underlying impoundment No. 1 were analyzed for SVOCs (Method 8270 TCL). In total, 16 soil samples were collected from the surface impoundment area and analyzed by CEIMIC Corporation. The laboratory analytical data for the samples collected in 1990 were compared to data for soil samples collected in 1989 from the bentonite layer beneath surface impoundment No. 3, as this layer contained the highest concentration of contaminants of concern (and the highest cancer and hazard risk) in 1989. The data for soil samples collected in 1990 revealed that the concentration of up to seven compounds were higher in 1990 than in 1989. These compounds were acetone, *bis*-(2-ethylhexyl)phthalate, beryllium, cobalt, nickel, copper, and methylene chloride. As such, the concentrations of these compounds were used to recalculate risk to workers (inhalation) and children (direct contact and ingestion). The risk calculations indicated a cancer risk to workers of 1.84×10^{-7}, which was below the MassDEP target risk of 1×10^{-5}. The hazard index risk to children was 1.76×10^{-2}, which was below the MassDEP target risk of 0.2. These data indicated that the soil met the clean closure requirements for public health risks.

The data for soil samples collected in 1990 were also used to evaluate compliance with the environmental clean closure requirements (Ref. SM-11). The 1990 data were compared to the MassDEP TCLP Selection Criteria defined in the Closure Performance Report and the data for samples collected in 1989. In 1990, three compounds were detected at concentrations exceeding the TCLP selection criteria, including *bis*-(2-ethylhexyl)phthalate, vanadium and lead. Of these, *bis*-(2-ethylhexyl)phthalate was also present a higher concentration in 1990 (1.8 mg/kg) compared to 1989 (0.77 mg/kg). However, TCLP analyses on the 1989 samples indicated that none of the compounds were detected in the leachate. Although the 1990 concentration of *bis*-(2-ethylhexyl)phthalate was higher than the concentration detected in 1989, ABB did not perform a TCPL analysis on this sample. Instead, ABB stated that TCLP data for soil samples collected from the New Boston facility in Boston, Massachusetts that contained *bis*-(2-ethylhexyl)phthalate at 7.1 mg/kg did not contain *bis*-(2-ethylhexyl)phthalate in the TCLP leachate. Based on this information, ABB concluded that since soil samples containing *bis*-(2-ethylhexyl)phthalate at 7.1 mg/kg at the New Boston facility did not pose a leachability threat to groundwater, then likewise a concentration of 1.8 mg/kg at the Mystic Station facility would not pose a threat either. As such, ABB concluded that the environmental clean closure criterion for soils was achieved.

Based on this information, MassDEP authorized the Facility to proceed with the closure activities (Ref. SM-12). On October 1, 1990, the Facility demolished the impoundments, excavated the visibly stained soil, and on November 5, 1990, backfilled the area with crushed stone. The excavated soil was treated on-site by asphalt batching, and the treated soil was then spread throughout the Facility grounds on December 7, 1990.

In accordance with the approved Closure Plan, ABB performed groundwater monitoring around the former surface impoundment area (Ref. SM-12). The sampling was performed from December 31, 1990, to January 9, 1991, and from February 4 to 11, 1991. In April 1991, ABB submitted a Groundwater Closure Performance Report, which included the results of a

comparison of the groundwater data to the groundwater closure performance criteria specified for surface impoundments under 310 CMR 30.00 and 310 CMR 30.617(a)(2) (Ref. SM-12). Based on a northerly groundwater flow direction, data collected from three upgradient monitoring well locations were compared to data collected from five down gradient monitoring well locations. The laboratory data indicated that the concentrations of eight detected compounds were statistically higher (at a 5% level) in down gradient monitoring wells compared with the upgradient wells. Specifically, these compounds included manganese, chloride, sodium, sulfate, iron, zinc, vanadium and tetrachloroethylene (PCE), as well as pH and specific conductivity. Of these compounds, only sodium exceeded the MCL, while PCE exceeded the Drinking Water Guidelines (DWG). However, detected concentrations of mercury and selenium also exceeded the MCL, but because these compounds were detected in both the upgradient and down gradient wells, it was suggested that the former surface impoundments were not the source of these compounds.

Based on these data, sodium and PCE exceeded the MCL/DWG and were statistically higher in down gradient wells compared with upgradient wells. However, ABB concluded that sodium is a naturally occurring constituent and may be associated with saline water located toward the northern portion of the Facility. As such, ABB concluded that PCE was the only contaminant of concern. However, ABB stated that chloroform was also detected in a down gradient well at a concentration that exceeded the DWG, but that because chloroform was also detected in an upgradient well at a statistically insignificant difference, that it should not be used to assess whether the former surface impoundments had impacted groundwater quality.

As such, ABB concluded that the closure requirements were not met with respect to PCE. ABB indicated that three additional monitoring wells would be installed, samples would be collected from the existing and newly installed groundwater monitoring wells, and the samples would be analyzed for VOCs (Method 8240 TCL), pH and specific conductivity. The addendum report with these data was not available in the file material or at the Facility. However, according to information in the clean closure letter, the addendum was provided to MassDEP in April 1992 (Ref. SM-13).

On October 19, 1992, the MassDEP issued a clean closure certification regarding the surface impoundments, and considered that the industrial exposure scenario (rather than residential) was appropriate (Refs. SM-13, SM-14). The letter indicated that the source of PCE could not be confirmed and concurred with ABB's conclusion that PCE was not associated with the operation of the former surface impoundments and was more likely related to other activities at the Facility or an off-site source (Refs. SM-13, SM-15). As such, an internal Facility memorandum indicated that the groundwater PCE issue would be addressed under the MCP 21E program (Ref. SM-13). Additional information regarding PCE in groundwater is discussed in Section 4.3 and under AOC 13.

On June 30, 2006, the MassDEP issued a Final Air Quality Operating Permit MBR-95-OPP-036M (Ref. SM-35). The permit was a minor modification to the original permit, which had an expiration date of December 16, 2006. The re-issued modified permit had an expiration date of December 16, 2009. The permit identified 16 emission units (and pollution control devises [PCD]) at the Facility, including four Safety Kleen parts washers (no PCD); two diesel generators (no PDU), four combined cycle steam generators (selective catalytic reduction, NO_x combustors, CO oxidation catalysts), two auxiliary boilers (NO_x burners and flue gas

recirculators), one simple cycle combustion turbine (no PCD), and four high pressure boilers (electrostatic precipitator).

Oily Debris

Currently, oily debris is separated from the corrosive wastewater via an oil/water separator in the wastewater treatment area located in the southern portion of the Facility (Ref. SM-36). The oily wastewater has been generated from the following six points:

1. Auxiliary bay sump pump discharge
2. Fire Pump House sump pump discharge
3. Tank farm sump discharge
4. Fuel oil additive area sump pump discharge
5. Equalization tanks
6. (Former) Unit Nos. 4-6 indirect waste from oily waste sump pumps.

The oily waste is pumped into an oily waste surge tank, which then flows to a 6,200-gallon corrugated plate oil/water separator designed for gravity separation of lubrication and fuel oils, and is finally accumulated in a 700-gallon waste oil reservoir within the oil/water separator. The accumulated oil is removed via a vacuum truck (Ref. SM-36). Oil accumulated in the equalization tank may also be removed by skimming.

Sludge

Currently, sludge is generated as part of the wastewater treatment system (Ref. SM-36. Sludge is accumulated in the equalization tanks and in the oil/water separator and is removed by a vacuum truck (Ref. SM-36).

Historically, sludge accumulated in the oil/water separator was manually removed using a sludge pump (Ref. SM-05). Oily residue accumulated in the clarifier was contained in a scum box, which was pumped to a sump for disposal by a licensed contractor. Sludge accumulated in the clarifier was pumped to a sludge dewatering building, where a vacuum filter was used for dewatering. The dewatered sludge was placed in dumpsters for off-site disposal at a landfill. A sludge sample was collected for analysis on May 22, 1985; the results indicated that the sludge was non-hazardous according to RCRA guidelines. Likewise, sludge that had accumulated in the surface impoundments was sampled on March 15 and November 21, 1985; the results indicated the sludge was non-hazardous according to RCRA guidelines (Ref. SM-05). No information was available regarding the frequency at which the sludge was removed from the surface impoundments (Ref. SM-05).

Combustion By-Products

Currently and historically, fly ash is generated as a by-product of burning No. 6 fuel oil (Ref. SM-05). Fly ash is contained and dewatered in an 18,000-gallon concrete-lined outdoor basin located behind the Unit 7 precipitator (Ref. SM-05). Vanadium oxide and/or pentoxide may have been present in the fly ash waste. Fly ash waste, at the time of the RCRA Part B application submittal, was categorically exempt from the hazardous waste regulations by

definition in 310 CMR 30.104(9). Currently, the outdoor basin is still used for fly ash storage. The fly ash is reportedly transported off-site for disposal on an as needed basis (Ref. SM-46).

Air Emissions

Air emissions have been produced during the combustion of natural gas and No. 6 fuel oil. Combustion by-products include nitrogen oxide, carbon monoxide, VOCs, sulfur dioxide, ammonia, and particulate matter, which are emitted via a stack at Unit 7 and four stacks at Mystic 8&9 under the MassDEP Air Permit MBR-95-OPP-036, which expires on December 16, 2009 (Ref. SM-35).

4.3 Regulatory History

The regulatory history of the Facility includes documented permits, regulatory inspections, and regulatory violations. A summary of these regulatory events is provided in the following sections.

Regulatory Permits and Activity

The following list summarizes the regulatory permits issued to the Facility, as documented in the available file material. Several of these permits were discussed in previous sections of this RFA report.

- November 19, 1980 – Initial RCRA Part A Application submitted (Ref. SM-03); original application not in the file material or at the Facility.
- March 29, 1983 – Revised RCRA Part A Application submitted under EPA ID Number MAD000842401 and NPDES Number MA0004740 (Ref. SM-03); Facility is granted interim status as a permitted hazardous waste treatment facility due to the treatment of corrosive waste in surface impoundments (Ref. SM-04)
- November 7, 1985 - RCRA Part B Exposure Information Request for Surface Impoundments submitted (Ref. SM-04)
- November 8, 1985 - RCRA Part B Application submitted (Ref. SM-05)
- March 31, 1986 – Notice of Deficiency issued regarding RCRA Part B application (Ref. SM-05)
- July 14, 1986 – Revised RCRA Part B Application submitted (Ref. SM-05)
- September 25, 1986 – Notice of Non-Compliance issued regarding groundwater monitoring of the surface impoundments (Ref. SM-06)
- August 31, 1998 – U.S. EPA and MassDEP NPDES Permit MA0004740 issued to allow discharge to the Mystic River; updated on August 17, 2001 (Ref. SM-31)
- September 20, 2000 – U.S. EPA NPDES Multi-Sector Permit MA05B587 issued (Ref. SM-29)
- March 7, 2006/June 30, 2006 – Air Permit MBR-95-OPP-036/Minor Modification of Operating Permit; expires December 16, 2009 (Ref. SM-35)
- June 1, 2007 – Massachusetts Water Resources Authority Sewer Use Discharge Permit Application, Permit Number 13 102507 (Ref. SM-36)

Regulatory Submittals and Inspections

On November 19, 1980, the Facility reportedly submitted a RCRA Part A application to the EPA, and on March 29, 1983, the Facility submitted a revised Part A and B Hazardous Waste Facility Criteria Status Application (Ref. SM-03); neither application is available in the file material nor at the Facility, but references are made to both in the revised application submitted in 1986 (Refs. SM-03, SM-05). At the time of the 1985 submittal, portions of the Facility were under construction and a temporary fly ash block pond was in use, possibly in the same general location as the current fly ash containment area. The application was submitted because the Facility generated hazardous wastewater related to the electricity generating process. On November 7, 1985, a revised application was submitted to EPA (Ref. SM-03). The Interim Status Revised Application stated that the temporary fly ash bock pond had been replaced with a permanent concrete-lined drying bed, and that the three surface impoundments had been constructed on the northeast portion of the Facility. The revised application indicated that the Facility was issued EPA RCRA I.D. MAD000842401 and NPDES Number MA0004740. On March 31, 1986, the MassDEP issued a Notice of Deficiency (Ref. SM-05); the notice was not available in the file material or at the Facility, but reference to the letter was made in the revised Part B application submitted on July 14, 1986.

Historical Regulatory Violations

Historical regulatory violations were identified in the file material (Ref. SM-03). This list was provided in the Part B Application dated November 7, 1985, and was required under 310 CMR 30.803(11). The historical violations were compiled by the Facility from information provided by MassDEP. The violations dated from 1969 through 1985. None of the violations involved criminal convictions, license revocations or suspensions. The majority of the violations were administrative in nature.

Water Violations

Agency:

U.S. EPA, U.S. Coast Guard

Incident Date Range:

April 20, 1974, through March 26, 1984

Regulation Cited (nature of violation):

309 (a)(3) Clean Water Act, 33 USC §1319 (NPDES compliance schedule)

33 USC §1321(b)(3) (Oil spills; reportedly less than 50 gallons each)

Air Violations

Agency:

U.S. EPA and/or MassDEP

Incident Date Range:

January 16, 1969, through September 6, 1983

Regulations Cited (nature of violation):

MBAPCB 6.1.1/6.1.2 and 310 CMR 7.06(1)(a) (opacity)

MBAPCD 1.1/MBAPCD #2 Order (Particulate soot fallout/soot and fly ash and smoke emission)

MBAPCD 4.2.1 (Alarm and recorder not calibrated)

Hazardous Waste Violations

Agency:

MassDEP

Incident Date Range:

December 23, 1982, through July 2, 1985

Regulations Cited (nature of violation):

310 CMR 30.516(20(a) & (b) (personnel training plan)
310 CMR 30.904 (closure plan)
310 CMR 30.903-906 and .908 (closure and liability requirements)
310 CMR 30.332 (annual report)
310 CMR 30.521 and .522 (contingency plan)
310 CMR 30.513 (waste analyses plan)
310 CMR 30.515 (inspection report)

September 25, 1986 – MassDEP Notice of Non-Compliance issued regarding surface impoundment groundwater monitoring activities (Ref. SM-06)

5.0 ENVIRONMENTAL SETTING

5.1 Facility Land Use

The land occupied by the Facility is used for an active electric power generating station. As a result, operations and maintenance and office staff are present at the Facility during normal day-time business hours and after-hours, as necessary. A security guard is present at the Facility 24-hours per day. Additional temporary occupants may include maintenance contractors, administrative workers, and other authorized personnel.

The property has been utilized for electricity generation since November 13, 1943 (Ref. SM-04). Prior to 1943 the property was not improved with any structures (Ref. SM-19). According to historical Sanborn Fire Insurance maps dated 1903, 1910, and 1950, the area surrounding the property was developed for industrial purposes, including a bed manufacturer and a gas and fuel company. Sanborn maps dated 1955, 1970 and 1972 depict the Facility as it appeared prior to the construction of Mystic 8&9 and the surface impoundments (Ref. SM-45).

The Facility is abutted to the south by the Mystic River, to the west by Alford Street, to the north by Dexter, Robin and Rover Streets, and to the east by Prolerized New England (a metals recycling facility) (Ref. SM-46). A sewage pumping station is located adjacent to the southwestern corner of the Facility. The nearest public recreational field is located across Dexter Street to the north of the Facility property, while the nearest residential dwellings are approximately 900 feet to the north of the Facility, along Lynde Street. The Facility is situated on approximately 75 acres, of which 17 acres are reportedly under water in the Mystic River (Ref. SM-19). The Mystic River is used for both industrial and recreational purposes and has been designated as a Class SC waterway by MassDEP; Class SC waterways are designated for the protection and propagation of fish, other aquatic life and wildlife, and for secondary contact recreation (Ref. SM-05).

5.2 Topography and Surface Water

The Facility is located in the southeastern portion of the Lower Mystic River Valley in the northern half of the Boston Lowland of the New England physiographic providence (Ref. SM-05). The Lower Mystic River Valley crosses the Facility from northwest to southeast. Most of the Boston Lowland along the Lower Mystic River Valley is less than 50 feet NGVD. NGVD is approximately mean sea level (MSL) and represents the actual MSL in 1929. The Lower Mystic River Valley once consisted of marshes and alluvial plains. Rolling hills to the northeast and southwest of the Facility consist of glacial drift.

The land surface at the Facility was once much lower, as indicated by an earlier natural Mystic River shoreline (Ref. SM-05). In *circa* 1870, a portion of the land currently occupied by the Facility was reclaimed. More major filling occurred in the 1930's for the construction of Units 1, 2 and 3 in the 1940's.

The Facility is situated on extensive clay deposits with localized deposits of sand and gravel (Ref. SM-04). The Facility is on a relatively flat area and is adjacent to the Mystic River. The elevation of the Facility varies from approximately 10 feet above mean sea level (MSL) to approximately 20 feet MSL at the northern portion of the Facility bordering Dexter Street. Bedrock is located approximately 120 feet below the ground surface (Ref. SM-08).

There are no natural surface water bodies located at the Facility (Ref. SM-46). However, stormwater originating at the Facility is collected in a series of four open, concrete-lined catchment basins, and is then discharged through one of two outfalls located on the southeastern portion of the Facility (Ref. SM-43). The outfalls discharge directly into the Mystic River. There is also a concrete-lined outdoor wastewater clarifier located in the wastewater treatment complex on the southern portion of the Facility.

5.3 Geology and Hydrogeology

Geology

The USPowerGen Facility is located in the Charlestown area within the City of Boston, Suffolk County, Massachusetts, which lies within the Wamsutta Formation (Ref. SM-08). Specifically, it is Cambridge Argillite, a grey argillite with minor quartzite.

The predominant lithology at the Facility has been described as fill material, ranging in depth from 5 to 20 feet (Ref. SM-08). The composition of the fill had been reported to contain coal ash (Ref. SM-26). Beneath the fill is a layer of organic soils, varying in thickness from 0 to 25 feet, followed by silty clay at a thickness ranging from 0 to 105 feet and interspersed with occasional lenses of sand typically ranging in thickness from 5 to 10 feet.

Hydrogeology

Groundwater has been observed in monitoring wells advanced within the property boundary at depths ranging from approximately 5 to 14 feet below the surface grade (Refs. SM-04, SM-12). In the southern portion of the Facility, groundwater flow direction is south toward the Mystic River. In the northern portion of the Facility, where sands and gravel are predominant, groundwater flow is toward a north/northwestern cove of the Mystic River. The influence of tides on groundwater flow direction is inconclusive; however, tidal fluctuations are thought to influence groundwater flow only in the southern portion of the Facility (Refs. SM-06, SM-08, SM-12).

Based on the MASS GIS website, no private or public potable drinking water wells are present within a 1-mile radius of the Facility. The nearest zone of classified groundwater is approximately 1 mile north and northeast of the Facility. Three wells in that area are reported to have yields of 200-300 gallons per minute.

5.4 Groundwater Monitoring History

Former Surface Impoundment Area

As previously described, in 1980 and 1987 nine groundwater monitoring wells (MW-1A and 1B, MW-2A and 2B, MW-3 through -7) were installed as part of the surface impoundment closure process (Ref. SM-12). The well locations were intended to represent down gradient and background conditions. Three additional wells (MW-8 though MW-10) were installed in 1991 (Ref. SM-20). The depth of installation for the four wells installed in 1987 ranged from approximately 25 to 40 feet below the ground surface. The wells were screened in a combination of fill, peat and organic soils, silty clay, and sand and gravel. The screened intervals ranged from approximately 10 to 25 feet and 25 to 40 feet below the ground surface.

The groundwater elevation was measured on three different dates (May 2, 1990, January 4, 1991, and February 8, 1991 (Ref. SM-12). During these periods, the minimum and maximum groundwater elevations ranged from 8.34 feet to 13.75 feet below the ground surface (bgs). Groundwater flow direction in this area is generally to the north, but during reduced infiltration periods (i.e., during the winter) the "extent of groundwater mounding on top of the silty clay soils is reduced and the point at which the northerly flow meets the regional southerly flow shifts on the Facility boundary in the area of the former surface water impoundments" (Ref. SM-12).

Southwestern Area

Groundwater wells had been advanced in the southwestern area of the Facility to assess impacts from historical releases from an outdoor transformer yard (these releases are described in greater detail in AOC 16 and 17). As such, on August 1, 1997, two groundwater wells (MW-1 and MW-2) were advanced down gradient from the release locations during an ASTM Phase II Assessment overseen by ABB Environmental Services, Inc (Ref. SM-20). MW-1 was located south of the Unit 4 precipitator and MW-2 was located south of the Unit 1 building. MW-1 was installed in clay and fine sand (slight to very strong petroleum odor noted) at a depth of 14 feet below the ground surface with a screened interval from 4 to 14 feet, while MW-2 was installed in sandy gravel (slight petroleum odor noted) to a depth of 15 feet below the ground surface with a screened interval at 5 to 15 feet. The depth to groundwater in this area was measured at 4.69 feet below the ground surface in MW-1 and 10.16 feet below the ground surface in MW-2, suggesting that groundwater in the southwestern portion of the Facility flows south toward the Mystic River.

Fuel Oil Tanks 1 and 2

Due to historical releases of No. 6 fuel oil in this area, two groundwater recovery and four monitoring wells are located within the boundary of the earthen berm for Tanks 1 and 2 (Ref. SM-28). The historical releases are discussed in greater detail in AOC 8. Three of the wells (MW-201, MW-203 and MW-204) were installed by ABB prior to 2000, but the dates and construction details were not available in the file material or from Facility representatives. In addition, in 1996 a well (MW-1) was installed between the earthen impoundment and the Mystic

River (Ref. SM-28). On July 20, 2000, GZA oversaw the installation of monitoring well GZ-301 within the bermed area. The well construction details were not provided. The depth to groundwater measured in January 2009 ranged from 6.54 to 7.93 feet below the ground surface (Ref. SM-47).

Outdoor Electric Substation

Two groundwater monitoring wells were installed on June 23, 2006, and three wells were installed on September 19, 2006, to assess groundwater impacts following the release and subsequent remediation of a release of mineral oil dielectric fluid on May 16, 2006, from the outdoor electrical substation located on the western portion of the Facility (Ref. SM-37). This release is described in detail in AOC 16 and AOC 17. The five wells (LE-MW-1, LE-MW-2, MW-3, MW-4, MW-5) were installed by Lightship Engineering. The wells were advanced to approximately 10 to 11 feet below the ground surface with 10 feet of screen. A third well (GZ-2) was also located in the vicinity of the area, though no information regarding the installation date or construction details was available in the file material or from Facility representatives. On July 27, 2006, Lightship Engineering measured the depth to groundwater at approximately 7 feet below the ground surface in the three wells (LE-MW-1, LE-MW-2, GZ-2). Additionally, 18.5 inches of NAPL was measured in LE-MW-2. On September 28, 2006, the depth to groundwater was measured at 6.01 to 11.05 feet below the ground surface in four wells (LE-MW-1, MW-3, MW-4, MW-5) and one recovery well (RW-2); no NAPL was observed in these wells. A groundwater elevation survey was performed and indicated the direction of groundwater flow was to the west.

Mystic 8&9

A Limited Environmental Site Assessment Report prepared by GZA in December 1999 makes reference to the Preconstruction Site Assessment (PSA) prepared by LFR on June 24, 1999 (Ref. SM-26). The PSA was conducted to assess the extent of contaminated soil and groundwater in the eastern portion of the Facility where Mystic 8&9 was to be constructed. As such, LFR advanced 61 soil borings, 14 test pits, and installed five groundwater monitoring wells. The construction details and location of the wells could not be determined because a copy of the PSA was not available in the file material or from Facility representatives. However, it is known that groundwater was sampled and analyzed for VOCs, SVOCS, EPH, PCBs, TPH and pH. The groundwater depth and flow direction were not summarized in the GZA report. However, it was reported that LNAPL was present in the wells and appeared to extend to the west of the Mystic 8&9 construction site. The LNAPL was detected from 4 to 5 feet to approximately 10 feet below the ground surface.

6.0 SWMU AND AOC DESCRIPTIONS

As previously described, an SWMU is defined as any discernable waste management unit at a RCRA facility from which hazardous constituents might migrate, irrespective of whether the unit was intended for the management of solid and/or hazardous waste. An AOC is an area where evidence of spills or other releases of waste or petroleum products have occurred resulting from waste management activities that may not fit the definition of a SWMU.

The following section provides information about each SWMU and AOC obtained from the file material and gathered during the VSI. A total of 6 SWMUs and 19 AOCs were identified at the Facility. The name of each SWMU and AOC is listed in Attachment 1 and their locations are identified on Figures 3 and 4, respectively. Photographs of the SWMUs and AOCs, when available, were taken during the VSI and are included in Attachment B.

The pathway(s) through which a release impacts the environment, and potential exposure points and receptors along that pathway, is discussed for each SWMU and AOC. These pathways include groundwater, surface water, air, soil, and subsurface gas. It is possible for a release to impact the environment through more than one pathway. The likelihood for a release pathway to be active is designated by an L (low), M (moderate) or H (high).

The discussion also includes an evaluation as to whether the need for further action is recommended for each SWMU and AOC. When further action is not recommended, it is noted as "No Further Action Required." When further action is recommended, it can take the form of interim measures (IM), a confirmatory sampling visit (SV), or a RCRA Facility Investigation (RFI) for each SWMU and AOC at the Facility. Interim measures are typically recommended to reduce the risk of immediate exposure of a release to the environment, and may take the form of repackaging damaged drums or installing warning signs for worker protection. An SV is often recommended to confirm that a release has occurred in support of a decision to require an RFI related to a particular SWMU or AOC. An RFI is recommended when evidence of a release is identified (either through information obtained from the PR and VSI, or following an SV) and additional corrective actions may be necessary.

6.1 Solid Waste Management Units

SWMU 1 - Oil Separator Pit/Former 1,000-gallon Waste Oil UST

TYPE OF UNIT: UST

PERIOD OF OPERATION: Early 1980's to no later than 1997

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION: Unknown

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Waste oil

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (H)
	Groundwater (L)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

The former Fuel Oil Tank 3 was surrounded by a steel dike. The diked area drained to a catch basin, which discharged to an oil/water separator pit (4-feet deep, concrete lined, open top) located outside of and to the east of the dike. The pit was installed in the early 1980's. The oil captured in the pit then drained into a 1,000 gallon UST, located adjacent to the east side of the pit. The inlet and outlet to the pit was eventually closed in circa 1994. The UST was reportedly removed prior to 1997, though no documentation exists in the file material. However, during a Phase I ESA conducted in 1997, vent pipes were observed in the area where the 1,000-gallon UST may have been located.

According to a Limited Environmental Site Assessment prepared by GZA in December 1999, in November 1999, the oil/water separator pit and the fuel lines were removed to make way for construction of Mystic 8&9 (Ref. SM-26). As such, this area would have been excavated and backfilled. Although no data appears to have been collected to indicate whether residual petroleum-impacted soil was present underlying the former footprint of the UST, the portion of the Facility in which the UST was located was issued a Class A-3 RAO on August 10, 2005. As such, no further investigations related to the UST are warranted under the MCP.

RECOMMENDATION:	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
Although residual petroleum-impacted soil was present underlying the former footprint of the UST, the impacted soil does not pose a risk to human health or the environment under the MCP Class A-3 RAO.

SWMU 2 - RTN 3-10431 (Waste Treatment Plant Storage Tank Farm)

TYPE OF UNIT: Wastewater storage tank farm

PERIOD OF OPERATION: 1983-2000

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION:

Between 1983 and 2000, eight waste water equalization tanks were located in the footprint of the southwestern portion of Mystic 8 & 9. The tanks were retired and removed in 2000 and were replaced with the current waste water equalization tanks.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Corrosive wastewater

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (M)
	Groundwater (L)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

On January 13, 1994, approximately 931,362 gallons of wastewater containing elevated levels of nickel was released from the wastewater treatment plant storage tank farm (Refs. SM-16, SM-17, SM-18). The cause of the release was attributed to cracks in five of the eight fiberglass suction drain lines servicing the eight tanks (Refs. SM-16, SM-17). During the remedial efforts, samples of the released wastewater were collected for analysis of Priority Pollutant Metals using EPA Method 200.7, TPH using EPA Method 418.1, pH and PCBs using EPA Method 6080 (Ref. SM. 16). The laboratory reported analytical data indicating that low levels of acetone, naphthalene, 2-methylnaphthalene, and TPH were present in the collected samples, and that pH was 3.68-5.7. PCBs were not detected above the laboratory method reporting limit. However, 10 of 13 priority pollutant metals were detected, though nickel was the only metal detected at concentrations above the MassDEP Reportable Quantity of 10 pounds. Based on mass balance calculations, approximately 59 pounds of nickel was released to the Mystic River (Ref. SM-18). Because the grounds of the Facility were frozen at the time of the release, the LSP of record stated that it was unlikely that the released wastewater could have infiltrated the soil.

Response actions were conducted by Clean Harbors and overseen by the LSP. In total, 569,560 gallons of effluent were recovered, while 361,802 gallons of effluent flowed over frozen ground and into the Mystic River. Based on the remedial actions, a Class A-1 Response Action Outcome (RAO) was achieved on March 14, 1994.

RECOMMENDATION:	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
The release was addressed and a Class A-1 RAO was filed in accordance with the MCP. As such, no further assessment or remediation is warranted in connection with this unit.

SWMU 3 – Former Wastewater Surface Impoundments

TYPE OF UNIT: Surface impoundments

PERIOD OF OPERATION: 1982 to 1988

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION:

The three former surface impoundments were constructed with a 45-mil Hypalon liner (consisting of two single Hypalon sheets bonded to a synthetic undersheet), a leachate detection/collection system, a bentonite clay liner, and a groundwater monitoring system (Ref. SM-04). Additional information regarding the operation and closure of the former surface impoundments are provided in Section 4.0.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Corrosive wastewater

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (M)
	Groundwater (M)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

On December 9, 1985, the Facility informed the MassDEP of a leak at the toe seam of the Hypalon liner of Pond No. 2 (Ref. SM-06). The leak rate was approximately 96 gallons per day, as determined by the leak detection system.

As previously described in Section 4.3, an investigation was performed to assess whether the wastewater had impacted soil and groundwater quality. The results of the investigation were evaluated by the MassDEP and were ultimately determined to not have had a negative impact on human health or environmental quality. As such, on October 19, 1992, the MassDEP issued a clean closure letter (Ref. SM-14). Therefore, no further action is warranted with regard to the former surface impoundments under the MCP.

RECOMMENDATION:	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
None.

SWMU 4 – Former and Current Wastewater Treatment System

TYPE OF UNIT: Wastewater Treatment System (excluding the surface water impoundments)

PERIOD OF OPERATION: 1983 to Present

PHOTOGRAPH NUMBER(S): 11, 13-23, 26-30

PHYSICAL DESCRIPTION AND CONDITION:

Between 1983 and 2000, eight waste water equalization tanks were located in the footprint of the southwestern portion of Mystic 8 & 9. The tanks were retired and removed in 2000 and were replaced with the current waste water equalization tanks. Prior to 1983, the facility may have utilized surface impoundments (see Section 4.0) and discharged waste water directly to the Mystic River. (A Sanborn Fire Insurance Map dated 1972 does not depict any wastewater treatment facility structures at the Facility.)

Between 1983 and the present, the basic elements of the wastewater treatment system have not substantially changed since first described in the file material (Ref. SM-04). The system includes the following components:

1. Pump house and pumps and current wastewater holding tanks
2. Oily waste surge tank and corrugated plate oil/water separator
3. Waste Treatment Building and equipment
4. Clarifier/Thickener
5. Sludge dewatering building and equipment
6. Polishing pond
7. Final pH adjustment and final monitoring equipment

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Approximately 25,500 tons of corrosive wastes (equivalent to 6,100,000 gallons of wastewater) have been treated annually by the Facility.

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (L)
	Groundwater (L)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

No releases from the current wastewater treatment system (operational period from 2000 to present) have been documented. However, in 1994 wastewater was released from former holding tanks; the release was issued RTN 3-10431 and is described under SWMU 2. The former holding tanks were removed from the Facility in 2000 and replaced with the holding tanks current in use at the Facility.

There are no records or observations of releases from the current waste water treatment system.

RECOMMENDATION:	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
None.

SWMU 5 – Former Coal Ash Pile

TYPE OF UNIT: Coal ash pile

PERIOD OF OPERATION: 1943 to Unknown

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION:

Historically, the Facility utilized coal-fired boilers in the electricity generating process. In the 1940's, coal piles occupied the eastern portion of the Facility (Refs. SM-07, SM-19, SM-45). According to a Preconstruction Site Assessment (PSA) report prepared by LFR and dated June 24, 1999, coal and coal ash was present in the fill in the Mystic 8&9 area, the area investigated (Ref. SM-26). This information suggests that coal ash may have been stored at the Facility.

According to Facility representatives, it is not believed that coal ash was buried at the Facility and any storage was temporary prior to being shipped off-site. However, the Facility was not able to locate any documentation regarding removal of the ash (Ref. SM-52).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Coal ash typically contains arsenic, chromium, lead, sulfur, silica, aluminum, iron oxide, calcium, and PAHs. If the coal ash was not stored in a containment unit, it is possible that soils could have been impacted with the aforementioned compounds at levels exceeding applicable MassDEP reportable concentrations.

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (H)
	Groundwater (L)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

Based on the file material, no evidence of a release had occurred. Furthermore, at the time of the VSI, no evidence of the former ash storage area was observed. However, coal ash has been identified in fill underlying portions of the Facility.

RECOMMENDATION:	No Further Action	( )
	Interim Measures	( )
	Confirmatory Sampling Visit	( )
	RFI Necessary	(X)

COMMENTS:
A description of the management of the coal ash was not available in the file materials. If additional information regarding the management of the coal ash is not provided by the Facility, then an investigation to assess whether the material impacted the environment is warranted.

SWMU 6 – Fly Ash Storage Basin

TYPE OF UNIT: Surface impoundment

PERIOD OF OPERATION: Unknown to Present

PHOTOGRAPH NUMBER(S): 07

PHYSICAL DESCRIPTION AND CONDITION:

The fly ash storage basin is an outdoor, concrete-lined, open topped 18,000-gallon basin designed to dewater fly ash generated from electricity generation activities at Unit 7 (Ref. SM-05). The basin is located to the north of the Unit 7 precipitator.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The basin is used for the dewatering of fly ash generated from the Unit 7 natural gas-fired boiler. The accumulated flyash is reportedly transported off-site for disposal on an as needed basis. The dewatered liquid is reportedly captured in a sump at the base of the basin and discharged to the wastewater treatment plant for treatment.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

No evidence of a release was noted in the file material or observed during the VSI. As such, no further action is warranted at this time.

RECOMMENDATION:

No Further Action	(X)
Interim Measures	( )
Confirmatory Sampling	( )
RFI Necessary	( )

COMMENTS:
According to Facility representatives, there is no on-going monitoring associated with the flyash storage basin (Ref. SM-52). The leachate goes through a sand filter and piping system and ends up in the sump adjacent to the basin. A qualified environmental contractor periodically removes the contents of the sump.

6.2 Areas of Concern

AOC 1 - Unit 7 Transformer Area

TYPE OF UNIT: Transformer

PERIOD OF OPERATION: Unknown

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION:

During a Phase I ESA conducted in 1997, "significant staining" of trap rock was observed below the Unit 7 Main and Station Service transformers. These two transformers reportedly never contained PCBs. The transformers were located adjacent to the outside of the western wall of the Unit 7 building. A concrete curb surrounding the transformers was also stained. A sump pit located within the curbed area discharged to another sump pit, which discharged to the Facility storage drainage system and then to the Mystic River.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Petroleum hydrocarbons

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (L)
	Groundwater (L)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

During the ASTM Phase II assessment performed by ABB on July 28, 1997, it was determined that the sumps were concrete lined and not connected to soil or groundwater, but liquid and sediment accumulated in the sumps could be manually drained to the storm water system, which ultimately discharges to the Mystic River (Ref. SM-20). Samples of the sediment were collected for TPH and PCB analysis. The data indicated that PCBs were not detected above the laboratory method reporting limit, but the sediments contained TPH at 52,500 mg/kg. However, because the sumps were not connected to soil or groundwater, the presence of petroleum hydrocarbons in sediment in the sump did not constitute a reportable condition to the MassDEP. ABB recommended that the sediment be removed using a vactor truck and transported off-site for disposal.

RECOMMENDATION:	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	()

COMMENTS:
Based on information provided by Facility representatives, the contents of the sumps have been removed at various times since the late 1990's when the issue was identified in the ABB report. On June 19, 2009, Clean Harbors drained, inspected and power washed the Unit 7 transformer sump. No sediment was observed. Some debris (gasket material, pieces of wood, etc) was identified. The water collected was disposed of through the station's wastewater treatment plant and the debris will be manifested offsite (Ref. SM-52). The facility must provide additional information on the frequency of the sump cleanouts.

AOC 2 - Unit 4 Building, Stained Areas

TYPE OF UNIT: Stained soil

PERIOD OF OPERATION: 1997

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION:

During a Phase I ESA conducted in 1997, potential oil stains were observed on trap rock located outside of the eastern exterior of the Unit 4 fuel oil heater room. Additionally, a standing pool of "greenish liquid, possibly No. 2 fuel oil" was observed in the same area. Speedi-dry appeared to cover most of this liquid at the time of the Phase I.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Petroleum hydrocarbons

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

Although no oil staining in this area was observed during a Limited Environmental Site Assessment performed in 1999, no samples were collected to confirm or refute the visual findings (Ref. SM-26). Based on this information, oil-impacted soil may still be present in the vicinity of Unit 4.

RECOMMENDATION:

No Further Action	( )
Interim Measures	( )
Confirmatory Sampling	( )
RFI Necessary	(X)

COMMENTS:
Surficial soil samples should be collected for petroleum hydrocarbon analysis in the vicinity of the Unit 4 fuel oil heater room exterior wall.

AOC 3 - Abandoned Sump Outside Unit 3

TYPE OF UNIT: Sump

PERIOD OF OPERATION: 1997

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION:

During a Phase I ESA conducted in 1997, an abandoned sump for a former acid tank was observed adjacent to the eastern exterior wall of the Unit 3 building (Ref. SM-19).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Acids

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (H)
	Groundwater (L)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

During the Phase I ESA, the sump was observed to contain water and trash, but did not appear to have a drain. However, if the sump overflowed the surrounding soil may have been impacted by acid. Based on this information, it is possible that corrosive soil is present in the vicinity of the sump.

RECOMMENDATION:	No Further Action	( )
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	(X)

COMMENTS:
Surficial soil samples should be collected in the vicinity of the sump to assess whether corrosive soil is present in this area.

AOC 4 - RTN 3-12422 (Exxon/Facility No. 6 Fuel Oil Pipeline)

TYPE OF UNIT: No. 6 fuel oil pipeline

PERIOD OF OPERATION: Unknown

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION:

Multiple, documented releases of No. 6 fuel oil occurred to soil located in the vicinity of the fuel pipeline that transfers No. 6 fuel oil between Exxon and the Facility (Refs. SM-10, SM-19).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

No. 6 fuel oil

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (H)
	Groundwater (M)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

On February 5, 1991, 30 gallons of No. 6 fuel oil was released to surface and subsurface soils. According to the Facility ICP, following the oil release the impacted soil was excavated and the fuel line was repaired. On December 20, 1991, 1,000 tons of petroleum-impacted soil was excavated during the replacement of the underground No. 6 fuel pipeline under MassDEP Case Number 3-1109. This soil was asphalt-batched on site. On February 14, 1993, 55 gallons of No. 6 fuel oil was released to surface and subsurface soils; and on July 22, 1993, 300 gallons of No. 6 fuel oil was released to subsurface and surface soils (Ref. SM-19).

On April 25, 1995, petroleum-impacted soil was found during another replacement of the underground pipeline; this release was issued RTN 3-12422 (Ref. SM-19). According to the MassDEP website, a Release Abatement Measure (RAM) Plan for removal of 600 cubic yards of soil was approved by MassDEP, and a Class A-2 Method 1 RAO was achieved August 28, 1995.

Based on the issuance of a Class A-2 RAO, no further remedial action with regard to releases in the vicinity of the underground oil transfer pipeline is warranted.

RECOMMENDATION:	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
Although petroleum-impacted soil was present in the vicinity of the fuel pipeline, the impacted soil does not pose a risk to human health or the environment under the MCP Class A-2 RAO.

AOC 5 - Abandoned Underground Storage Tanks – Locations Unknown

TYPE OF UNIT: Underground storage tanks for fuel and transformer oil

PERIOD OF OPERATION: 1956 through 1994

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION: Unknown

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The Facility was issued Massachusetts permits to abandon six USTs in place (Ref. SM-19). Copies of the permits are not available in the file material. The location, condition and contents of these tanks at the time they were abandoned are unknown. The tanks included:

1. 35,000 gallon No. 6 fuel oil tank. Installed in 1956 and abandoned in 1978.
2. 80,000 gallon No. 6 fuel oil tank. Installed in 1956 and abandoned in 1994.
3. 3,300 gallon No. 2 fuel oil tank. Installed in 1956 and abandoned in 1978.
4. 3,744 gallon No. 2 fuel oil tank. Installed in 1965 and abandoned in 1978.
5. 20,000 gallon transformer oil tank. Installed in 1965 and abandoned in 1987.
6. 25,000 gallon No. 2 fuel oil tank (the "jet fuel" tank). Installed in 1969, date abandoned not reported.

The Phase I ESA from which this information was obtained did not indicate the location of these tanks (Ref. SM-19). However, the issuance of the closure permits suggests that the USTs would have been emptied of product prior to closure. The Phase I ESA did not indicate that releases were known to have occurred from these USTs.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (M) Groundwater (M) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

No releases of oil from the USTs have been documented.

RECOMMENDATION:

No Further Action	( )
Interim Measures	( )
Confirmatory Sampling	( )
RFI Necessary	(X)

COMMENTS:
Facility representatives are currently performing a review for documentation on the closure of the tanks. Information was provided indicating that the 25,000 gallon No. 2 fuel oil tank (the "jet fuel" tank (tank No. 6 in the list above) was replaced in 1998. Furthermore, activities related to the closure were issued RTN 3-16553 and a subsequent Class A-2 RAO was achieved on May 4, 1998 (Ref. SM-52).

However, unless additional information is obtained for the remaining five tanks, additional investigations to verifying that the surrounding soil was free from contamination upon removal or closure of the tanks is warranted.

AOC 6 - Spill of Unknown Location

TYPE OF UNIT: Unknown

PERIOD OF OPERATION: 1976

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION: Unknown

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Fuel oil

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (H)
	Groundwater (M)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

According to a historic BECo database report, on March 5, 1976, approximately 9,000 gallons of fuel oil was released to the environment (Ref. SM-19). No information regarding the location of the release or subsequent remedial actions was provided in the file material. The ASTM Phase II prepared by ABB on September 9, 1997, states that the release "likely occurred near oil storage tanks, pipelines, valves, and/or other fuel handling equipment" (Ref. SM-20). The majority of areas at the Facility with "fuel handling" equipment have been assessed. Furthermore, the presence of LNAPL in groundwater at the Facility is being managed under a Class C RAO. As such, although the location of the 1976 release is unknown, the released fuel oil may have been assessed with other fuel oil releases at the Facility. However, a release of this magnitude must be adequately assessed, remediated, and monitored. As such, the Facility must either provide additional information to demonstrate that these activities have been performed, or conduct an investigation to demonstrate compliance with applicable cleanup regulations.

RECOMMENDATION:		
	No Further Action	( )
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	(X)

COMMENTS:
Based on information provided by Facility representatives, no further information regarding this release could be found. As such, an investigation is warranted.

AOC 7 – RTN 3-0923 and Related Releases at Mystic 8&9 Development Area

TYPE OF UNIT: Petroleum-impacted soil

PERIOD OF OPERATION: 1943 through 2005

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION:

AOC 7 represents petroleum-hydrocarbon releases that have occurred on the portion of the Facility occupied by the Mystic 8&9 development area. Two of the releases listed under AOC 7 were assigned RTN numbers 3-18553 and 3-18717, and were subsequently linked to RTN 3-0923. Each release is described in detail in the following paragraphs.

Prior to the construction of Mystic 8&9 in 2004, the eastern portion of the Site included the former wastewater surface impoundments (SWMU 3), Tank No. 3 aboveground bulk No. 6 fuel oil storage tank, an oil/water separator UST (SWMU 1), several control structures, and a City of Everett municipal stormwater sewer and associated easement.

The following paragraphs describe specific releases in the eastern portion of the Facility. This discussion does not include releases of wastewater that occurred from the former surface impoundments; a discussion of the surface impoundments is provided in Section 4.3 and SWMU 3.

Tank 3 Release (Original RTN 3-0923 release)

On February 1, 1987, approximately 29,000 gallons of No. 6 fuel oil was released due to the overfilling of Tank No. 3, a steel bulk No. 6 fuel oil AST with a 10,332,000-gallon capacity, located within a steel dike with an earthen floor (Ref. SM-19). Of the volume released, approximately 1,500 gallons was released to the diked area, 26,500 gallons was released into the storm drain system via the fire protection foam lines, and 1,000 gallons was released into the Mystic River via the storm drains. Remedial actions involved the removal of 41,000 gallons of oily water from the storm drains and river, and 59,000 pounds and 25 cubic yards of oily solids from the dike area.

On August 20, 1988, oil was observed in the Mystic River and was found to have entered the river from a cracked storm drain (Ref. SM-19). Five test pits were dug (locations unknown) and free product was observed in each pit. The source of the oil was believed to be leaking underground pipes associated with Tank No. 3. This release was initially designated ERB-N88-1627.

As a result of these releases, a Phase I investigation was conducted in July 1995 (Ref. SM-19). Total petroleum hydrocarbons were detected at a concentration of 180,000 ppm in one of six surficial soil samples collected from within the dike area. As a result, additional investigations involving the collection of additional surface soil sampling in the dike area were to be performed under a Phase II Comprehensive Site Assessment (CSA).

During a Phase I ESA conducted in 1997, hardened No. 6 fuel oil and soil staining was observed around a plugged catch basin located in the southwest portion of the dike area (Refs. SM-19). The oil and soil staining may have been related to the release of 1,500 gallons of No. 6 fuel oil on February 1, 1987.

According to references SM-26 and SM-33, a Phase II/III report was prepared by ABB on August 7, 1997. The report concluded that soil contamination in the vicinity of Tank No. 3 was localized to a thin soil layer, approximately 6 inches below the ground surface, and the areal extent was approximately 20-by-100-feet (Ref. SM-26). Additionally, a condition of No Significant Risk did exist for groundwater because none of the groundwater exposure point concentrations exceeded the MCP Method 1 standards. Furthermore, a condition of No Substantial Hazard related to soil or LNAPL did exist due to the low leaching potential and slow migration of LNAPL. However, because a condition of No Significant Risk was not being achieved, the Phase III report was prepared.

The Phase III report evaluated potential remediation strategies for contaminated soil and LNAPL in groundwater (Ref. SM-26). The remedial goal for LNAPL in groundwater was to achieve an LNAPL thickness of less than 0.5 inch, while in soil it was to reduce contaminant concentrations to levels below the MCP Method 1 S-1 standard. Reducing concentrations to background levels was thought not achievable given the industrial history of the Facility and the surrounding area. The Phase III report recommended extracting the LNAPL from groundwater from existing recovery wells on a monthly basis for at least one year using a vacuum system, while no action was recommended for soil contamination, as costs were considered restrictive for excavation and/or in-situ treatment. The Phase III report concluded that a Class C RAO was achievable.

A Phase IV Remedy Implementation Plan (RIP) was prepared by GZA on August 7, 1998 (Ref. SM-26). The Phase IV RIP described the protocols to remove LNAPL from the groundwater at existing recovery wells using a vacuum truck on a monthly basis for at least one year. Following one year of removal, the protocol was to be re-evaluated.

During this time, the Facility began planning to construct Mystic 8&9 in the eastern portion of the Facility. Because site development related to the pending construction of Mystic 8&9 would expose construction workers to contaminated soil and groundwater, a Remedial Alternative Evaluation (RAE) was prepared by LFR on May 26, 1999 (Ref. SM-26). The RAE identified the boundary of the proposed development area and included laboratory analytical data for soil and groundwater samples collected from locations within the development area. In addition, the RAE included an MCP Method 3 Risk Characterization to assess worker hazards. The Risk Characterization concluded that areas with NAPL contamination posed a Significant Risk to construction workers. As such, the RAE recommended remedial actions to reduce the risk presented by the NAPL to construction workers. Specifically, the RAE recommended excavating the soil with NAPL contamination. The RAE noted that excavation would not completely remove all petroleum-impacted soil, but reducing the contaminant mass would make the area safe for workers.

On July 23, 1999, the original Phase IV RIP was modified (Ref. SM-24). The modification to the RIP was necessary because the original RIP was prepared prior to the decision to construct Mystic 8&9 and only addressed LNAPL in groundwater. As such, the modified RIP was

intended to protect workers who would be working within the proposed Mystic 8&9 construction area. The modified RIP sought to remove soil from the area of the proposed construction where LNAPL was present or where high concentrations of petroleum in soil were observed. The modification had four remedial components: (1) soil management associated with excavation activities; (2) groundwater management associated with dewatering activities (groundwater was present at 5-10 feet bgs); (3) installation of shoring systems during construction; and (4) groundwater containment to prevent LNAPL or petroleum-contaminated groundwater from re-entering the construction area.

According to information in a Limited Environmental Site Assessment Update (Ref. 26), on June 24, 1999, a Preconstruction Site Assessment (PSA) report was prepared by LFR. The PSA involved the collection and analysis of soil and groundwater samples in the proposed Mystic 8&9 construction area. Sixty-one borings and 14 test pits were completed and five groundwater monitoring wells were installed; information about the well construction and location was not available in the file material. The data indicated that LNAPL and PAHs were present in the soils, in addition to coal and coal ash in the fill underlying the Site (Ref. SM-26). Furthermore, metals and PCBs were detected in the soil at concentrations above background. In groundwater, LNAPL (resembling No. 6 fuel oil) was present in the west central portion of the construction area and was thought to extend beyond the western boundary of the construction area. Furthermore, the LNAPL thickness extended from 4 to 10 feet below grade, and was anticipated to be greater than 10 feet thick to the west of the "stormwater line."

According to information in Ref. 26, on July 16, 1999, a report titled "Results of Recent Sampling Activities" was prepared by LFR. This report indicated that on May 17, 1999, LFR collected groundwater from seven monitoring wells to supplement the PSA field activities; the well locations were not specified. The laboratory data reportedly indicated that metal and VOC concentrations were below the MCP Method 1 GW-2 and GW-3 standards. However, naphthalene was detected at elevated concentrations in monitoring well MW-56, and EPH was present in wells MW-56 and MW-45. No further information regarding the data was provided.

On June 25, 1999, a Release Abatement Measure (RAM) Plan was prepared by GZA to address the LNAPL recovery effort (which had occurred monthly since August 1998), the removal of other petroleum-impacted soil on the eastern portion of the site, and to address the management of soils associated with the planned construction of Mystic 8&9 (Ref. SM-26).

During site preparation work related to the construction of Mystic 8&9, four abandoned railroad tracks were removed from the construction area (Ref. SM-26). Oil-contaminated soil was observed underlying the tracks. The RAM Plan recommended staging the oil-impacted soil on-Site prior to disposal or reuse. From June 25, 1999, through July 27, 1999, activities described under the RAM Plan were performed in conjunction with the removal of the oil-contaminated soil. Approximately 730 tons of soil and 37 tons of railroad ties, spikes and debris were removed from the Facility. The excavation area was approximately 9,000 square feet. Confirmatory soil samples were collected from the limits of the excavation and analyzed for metals, extractable petroleum hydrocarbons (EPH) and volatile petroleum hydrocarbons (VPH). The data indicated that site-specific cleanup goals had been achieved. However, *bis*-(2-ethylhexyl)phthalate was detected in selected confirmatory soil samples at concentrations above the MassDEP Reportable Concentration for Category S-2 soils. As such, a release notification was made on July 21, 1999. GZA stated that future response actions related to the presence of *bis*-(2-ethylhexyl)phthalate

would be addressed under the RIP. These actions would later be completed under RTN 3-18553. (See below for a discussion of RTN 3-18553.)

On July 15, 1999, a second Method 3 Risk Characterization was performed for workers involved within the construction of Mystic 8&9 (Ref. SM-26). The report was prepared by LaGoy Risk Analysis, Inc. The report concluded that the potential for health risks to construction workers was limited within the construction area, but that oil-contaminated soil in the west-central portion of the construction area posed a risk to workers under conditions of regular exposure. In addition, a white ash-like substance that had a naphthalene/styrene odor and may have been noticeable by Site workers was observed in the southeastern portion of the Site. The Risk Characterization concluded that the Site did not pose health risks to workers involved with constructing Mystic 8&9, and assumed that the remediation of NAPL present in soil in the west-central portion of the construction area had been completed. Furthermore, the report concluded that a condition of No Significant Risk existed for Public Welfare and Safety, with the exception of the LNAPL present in groundwater at a thickness of greater than ½-inch. LNAPL present at greater than ½inch thick by definition poses a risk to public welfare and is a UCL exceedance as specified under the MCP.

According to a Limited Environmental Site Assessment prepared by GZA in December 1999, in August 1999, Tank No. 3 was demolished, the tank and foundation were removed (soil volume, disposal location not reported) and the area was backfilled with off-site material (Ref. SM-26). Site development work for Mystic 8&9 then began in earnest from November 12, 1999, through March 15, 2000 (Ref. SM-27). During this period, approximately 49,000 tons of contaminated soil was removed from the eastern portion of the Facility, including the area occupied by the former Tank 3. The contaminated soils were transported under manifest to the Raynham Landfill, Woburn Landfill, Clean Waters of America in Chichester, New Hampshire, American Reclamation Corporation in Charlton, Massachusetts, Commercial Recycling Services in Scarborough, Maine, and Aggregate Recycling Corporation in Eliot, Maine. Confirmation soil samples were collected from the limits of the excavation by GZA (Ref. SM-27). The data were ultimately used to support a Class A RAO.

RTN 3-18717

On September 7, 1999, Facility personnel observed an oily sheen on the Mystic River (Ref. SM-25). An investigation to locate the source of the release revealed that oily water was discharging from holes in the sheet pile seawall near a former stormwater discharge. An investigation to assess the nature and source of the discharged oil determined that the release consisted of stormwater, groundwater, and LNAPL related to No. 6 fuel oil. Furthermore, the source of the oil was determined to be from an abandoned 26-inch diameter stormwater drain pipe. This drainpipe, prior to being abandoned, had been connected to drainage systems in the area of Tank 3 (see RTN 3-0923). After the Tank 3 release on February 1, 1987, the drainpipe was reportedly closed in 1988 by sealing it with concrete at two ends. However, the investigation revealed that the end of the drainpipe nearest the seawall had failed and, furthermore, that the drainpipe apparently still contained No. 6 fuel oil. In addition, groundwater containing LNAPL had infiltrated the pipe. The source of the LNAPL in the groundwater was considered to be from the aforementioned release on February 1, 1987 (RTN-0923), as well as a release of 5,000 gallons of No. 6 fuel oil in February 1995 at Unit 7 (RTN 3-12140) and a release of 67,000 gallons in

December 1998 at Tanks 1 and 2 (RTN 3-17789). (See AOC 8 for a discussion of RTN 3-12140 and RTN 3-17789.)

Remedial activities to address the release assigned RTN 3-18717 were performed between September 7 and September 28, 1999 (Ref. SM-25). These activities included boom deployment, recovery of oil on the Mystic River using a vacuum truck, repairing the seawall holes, removing a portion of the underground stormwater pipe, and sealing the remaining portion of the pipe with concrete and closing upstream manholes. Oil-impacted soil around the pipe was excavated and transported off-site for disposal at the Sawyer Landfill in Maine, and the excavation was backfilled with clean fill. No samples were collected, as the response actions related to this release were to continue in conjunction with Comprehensive Response Actions under the aforementioned Phase IV RIP.

Oil Pump Starters Stained Soil

During the Phase I ESA conducted in 1997, oil staining was observed in the vicinity of the oil-pump starters associated with the former Tank No. 3 (Ref. SM-19). The oil-pump starters were located in an asphalt-bermed area south of Tank 3. Oil staining extended over the berm and onto the adjacent gravel surface. The stained area was approximately 4 square feet in area.

Based on this information, the berm was unable to contain released oil (or oily water) and oil may have impacted underlying soil and groundwater. No information was provided in the file material indicating whether the stained area was remediated.

In August 1999, the oil-pump starters were decommissioned and demolished to make way for construction of Mystic 8 & 9 (Ref. SM-26). GZA stated in the Limited ESA report dated December 1999 that no signs of staining remained in the footprint of the oil pump starters. Although no subsurface soil samples were collected to assess potentially unseen subsurface petroleum impacts in soil related to the oil-pump starters, this area was addressed under the Phase IV RIP.

RTN 3-18553 (Phthalate-contaminated soil)

While conducting the RAM plan activities associated with the remediation of RTN 3-0923 from June 25, 1999, through July 27, 1999, soil containing *bis*(2-ethylhexyl)phthalate at concentrations exceeding the MassDEP Reportable Concentration were identified during the removal of railroad tracks in the Mystic 8&9 construction area (Ref. SM-26). On July 22, 1999, the release of *bis*(2-ethylhexyl)phthalate was issued RTN 3-18553. In August 1999, the *bis*(2-ethylhexyl)phthalate-impacted soil was excavated under the Phase IV RIP, and the release was linked to RTN 3-0923 on July 19, 2000 (Ref. SM-27). No additional information about this release was available in the file material, on the MassDEP website, or from Facility representatives.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

No. 6 fuel oil, phthalates.

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (H)
	Groundwater (M)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

Investigations and remediation were performed in conjunction with these aforementioned documented releases, but complete closure of the area could not be achieved due to the presence of buildings and equipment in active use. As such, a Class C RAO (temporary solution) was obtained for the contaminated soil and groundwater present in this area. However, once plans to construct Mystic 8&9 in this area were established, it became possible to consider seeking a Permanent Solution. As such, during site development related to the construction of Mystic 8&9, contaminated soil and groundwater was removed from the area and treated and/or disposed of off-site under a Phase IV Remedy Implementation Plan (RIP) and Release Abatement Measures. Following the completion of the remedial activities in 2004 a Method 3 Risk Characterization was performed. The Risk Characterization determined that a condition of No Significant Risk to human health or the environment did exist. Furthermore, an AUL was implemented to limit future use of the eastern portion of the Site to industrial activities. By achieving a condition of No Significant Risk and applying the AUL, a Class A-3 RAO was ultimately achieved for this area on August 10, 2005.

RECOMMENDATION:	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
The eastern portion of the Facility was issued a Class A-3 RAO on August 10, 2005. As such, under the MCP no further assessment or remediation is warranted in connection with the aforementioned releases.

AOC 8 – Releases at Tank 1 and Tank 2 (RTN 3-12140 and RTN 3-17789)

TYPE OF UNIT: Bulk No. 6 fuel oil AST

PERIOD OF OPERATION: Unknown to Present

PHOTOGRAPH NUMBER(S): 08

PHYSICAL DESCRIPTION AND CONDITION:

Tanks 1 and 2 are each 1.9 million gallon bulk aboveground storage day tanks for No. 6 fuel oil. The tanks are located within an earthen bermed containment area in the southeastern portion of the Facility. The oil stored in the tanks is used for the operation of Unit 7 and Mystic 8&9. At least three documented oil releases have occurred within the bermed area. The location of a fourth release in 1983 could not be confirmed, though based on information available in the file material, the release most likely occurred in the area of Tank Nos. 1 and 2.

In 1983, several releases of No. 6 fuel oil reportedly occurred from a cracked underground BECo fuel line. An unspecified volume of oil leaked into the storm drain and eventually was discharged to the Mystic River (Refs. SM-08, SM-19). Other spills had impacted soil, which was reportedly excavated and replaced (the volume of soil was not specified). A recovery well system was reportedly installed in the immediate area of a storm drain system and a 30-inch diameter drain pipe was installed to collect oil in the vicinity. No further information was provided regarding this release area in the file material. However, based on the file information, these releases most likely occurred within the berm for Tank Nos. 1 and 2.

The first documented release in the Tank 1 and 2 area occurred on or prior to November 3, 1986, when 800 gallons of No. 6 fuel oil was discovered leaking from a damaged flange (Ref. SM-19). No further information regarding the release was available in the file material or from Facility representatives (Ref. SM-28).

On February 4, 1995, a release of 5,000 gallons of No. 6 fuel oil was assigned to RTN 3-12140 (Ref. SM-19). (The release was later linked, then un-linked from RTN 3-0923.) The oil was released from a transfer pump located in a concrete containment area within the bermed area. Under an IRA dated April 5, 1995, removal actions involved the excavation of approximately 120 tons of contaminated soil and trap rock (Ref. SM-28). A Phase I investigation was conducted under the MCP and included the collection and analysis of four surficial soil samples collected 2 inches below the ground surface on March 7, 1995 by ABB (Refs. SM-19; SM-28). The soil samples were collected "to represent the concentration to which a receptor would be exposed" (Ref. SM-28). The results indicated that TPH was present in soils at concentrations ranging from 5,070 ppm to 19,300 ppm. On August 2, 1995, ABB submitted a Phase I Initial Site Investigation Report and Tier Classification Submittal to MassDEP and defined the release site as a Tier II site under the MCP (Ref. SM-28). However, at the time, the release addressed under RTN 3-12140 was linked to other releases listed under RTN 3-0923, so the Phase I investigation accounted for both RTNs.

In July 1997, ABB prepared a Phase II CSA and Phase III RAP for RTN 3-12140 and RTN-0923, as the RTNs were still linked at that time (Ref. SM-28). The CSA identified the nature and extent of contamination, provided recommendations to recovery LNAPL, and concluded that a condition of No Significant Risk did not exist for LNAPL or soil at the Site. However, a condition of no Substantial Hazard did exist because of the low leaching potential and slow migration of LNAPL and the limited exposure to oil-impacted soil and LNAPL in groundwater (Ref. SM-28). The Phase III recommended using a vacuum truck to remove LNAPL, while no action was recommended for oil-impacted soil (presumably due to the low exposure potential).

On August 7, 1998, GZA completed a Remedy Implementation Plan (RIP) (Ref. SM-28). Under the RIP, LNAPL was vacuumed monthly for one year from two recovery wells (RW-1 and RW-2) located within the bermed area; no information was available on the construction or dates of installation of the recovery wells. This remedial activity was to be re-evaluated after one year.

While vacuum recovery was under way, on December 24, 1998, another release of No. 6 fuel oil was discovered within the bermed area of Tanks 1 and 2 (Refs. SM-23, SM-28). The release was assigned RTN 3-17789. Approximately 50,000 gallons of No. 6 fuel oil was released from two 1-inch drain lines that reportedly fractured due to vibration fatigue (Ref. SM-23). Under an IRA that spanned from December 24, 1998, to April 9, 1999, approximately 25,000 gallons of oil and water (rainfall) was removed by Clean Harbors and transported under manifest for off-site disposal at Murphy's Waste Oil Services in Woburn, Massachusetts, and 42,000 gallons of No. 6 fuel oil was recovered for reuse in Tank No. 4. In addition, approximately 1,500 tons of oil-impacted soil was transported under Bills of Lading by Clean Harbors for off-site disposal at either the Clean Harbors Braintree, Massachusetts facility or at ESMI in Loudon, New Hampshire. Clean Harbors stated that residual oil-impacted soil located in inaccessible areas was left in place, and that remedial actions related to those soils would be conducted under on-going Phase IV RIP response actions related to RTN 3-12140 and RTN 3-0923.

As such, as previously described in Section 5.5, on July 20, 2000, GZA oversaw the installation of monitoring well GZ-301 within the berm area (Ref. SM-28). The well construction details were not provided. On July 21, 2000, GZA sampled groundwater monitoring wells MW-203, MW-204 and GZ-301 for VPH and EPH analysis. Approximately 1.2 feet of LNAPL was present in MW-203, which is a categorical exceedance of the Upper Concentration Limit established in the MCP under 310 CMR 40.0996(6). Other groundwater gauging data were not provided in the file material. By August 2000, GZA reported that approximately 1,560 gallons of LNAPL had been recovered, though only approximately 50-100 gallons had been recovered from wells located within the bermed area (Ref. SM-28).

In the August 2000 Phase IV FIR and Class C RAO Report, GZA noted that the concentration of EPH fractions detected in samples collected from the upgradient well MW-204 were 20 to 200 times higher than the concentrations detected in samples collected from the down gradient wells (MW-1 and GZ-301), suggesting that the release of No. 6 fuel oil within the bermed area was located in the northern portion of the bermed area, and that the LNAPL detected in MW-203 had not migrated to the Mystic River (Ref. SM-28).

The Phase IV report included an evaluation of substantial hazards based on soil data collected in 1995, 1997 and 2000, and groundwater data collected in 1996 and 2000 from groundwater

monitoring wells located within the bermed area. It was determined that the groundwater was present at a depth unlikely to come into contact with Site workers. As such, "groundwater exposures were not considered in the evaluation of human health risks." Based on the results of the evaluation, it was determined that No Substantial Hazard to the environment did exist, but that a condition of No Significant Risk had not been achieved due to the presence of LNAPL at a thickness of 1.2 feet in MW-203, a UCL exceedance that indicated a potential for future risk to public welfare and the environment. As such, on August 8, 2000, the requirements for a Class C 1 RAO had been achieved for the area within the berm. In accordance with the Class C 1 RAO, post-RAO Operation and Maintenance Activities were planned for five years. These activities included gauging for LNAPL, manual recovery of LNAPL, collecting groundwater samples for dissolved petroleum hydrocarbons, and evaluating changes in site conditions over time.

On April 16, 2008, GZA prepared a Post-RAO Operation, Maintenance and/or Monitoring Report No. 14 (Ref. SM-40). The report stated that a periodic evaluation of the Temporary Solution was submitted on August 10, 2005. The 2005 and the 2008 report indicated that LNAPL remained present in monitoring well MW-203 at a thickness of approximately 0.49 feet, which is greater than the UCL of 0.5 inches. In addition, three recovery wells (RW-FT-1, RW-FT-2, RW-FT-2A) had evidence of a sheen and a tar-like separate phase in the water column or at the bottom of the well. Due to the inability to excavate impacted soils within the bermed area (the area was actively used during normal Facility operations), the Facility would work toward a Permanent Solution through a combination of manual removal and natural attenuation of LNAPL. The report concluded that since 2000 approximately 33.5 gallons of LNAPL had been recovered. The recovered LNAPL was placed in the wastewater treatment system oil/water separator.

On August 7, 2008, and January 23, 2009, GZA submitted requisite Post-RAO Operation, Maintenance and/or Monitoring Reports (Refs. SM-41, SM-42). The reports provided similar information as the April 16, 2008, report, with the exception that recovery well RW-FT-2A was dry and had been damaged and was no longer used as a monitoring location; a replacement well was not installed. The reports indicated that the LNAPL thickness in MW-203 was measured at 1.38 feet on December 9, 2008, 0.99 feet on July 8, 2008, and 0.61 feet on May 30, 2008.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

No. 6 fuel oil

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (H)
	Groundwater (H)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

The release of at least 55,800 gallons of No. 2 fuel oil has been documented within the bermed area of Tanks 1 and 2.

RECOMMENDATION:	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:

The release has been adequately assessed and managed under a Temporary Solution (Class C RAO). The Facility continues to monitor LNAPL and evaluate strategies to reach a Permanent Solution. The monitoring program to assess the potential migration of the release has been approved under a MCP Class C RAO.

AOC 9 - Former Fly Ash Storage Basin Pump Room

TYPE OF UNIT: Pump Room

PERIOD OF OPERATION: Unknown up to 1999

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION:

During the ASTM Phase I ESA conducted in 1997, a green liquid presumed to be ethylene glycol anti-freeze was present on the floor of the fly ash storage basin pump room, which was located north of the Unit 7 Precipitator. A sump pump was present in the floor and was reportedly pumped out manually (Ref. SM-19). Based on the available information, it appears that the release was contained within the pump room.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Ethylene glycol

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (L)
	Groundwater (L)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

In December 1999, a Limited ESA was conducted at the Facility. The Limited ESA report indicated that the fly ash storage basin pump room was demolished in October 1999 to make way for Mystic 8&9 on the eastern portion of the Facility (Ref. SM-26). However, information provided by Facility representatives indicated that the fly ash storage basin pump room was not demolished and has not been relocated; there were modifications made to the storage room pump room to accommodate construction of Mystic 8&9 (Ref. SM-52). No signs of staining were reported in the vicinity of the building exterior during the VSI. Although no indication of confirmatory sampling was provided in the file material, the release appears to have been contained and did not affect soil and groundwater beneath the facility.

RECOMMENDATION:	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
None.

AOC 10 - RTN 3-19849

TYPE OF UNIT: Unit 4 Building

PERIOD OF OPERATION: Unknown

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION:

The Unit 4 generation building is located on the western portion of the Facility. It is currently deactivated.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

No. 6 fuel oil

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (L)
	Groundwater (L)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

On August 17, 2000, an unspecified volume of pre-heated No. 6 fuel oil was released inside the Unit 4 generation building (Ref. SM-30). At the time, a 135-megawatt steam turbine generator was operational inside the Unit 4 building. The No. 6 fuel oil was transferred from Tanks 1 and 2 via piping (underground or above-ground not specified). The released oil migrated to a utility trench located in the floor of the Unit 4 building. Facility personnel initially believed that the trench was connected to the wastewater treatment system until they discovered an oil sheen exiting the cooling water discharge flume and entering the Mystic River.

As a result of the release, response actions were conducted under the Facility OPA-90 plan. These activities involved placing boom along the river to contain the released oil. In addition, the trench inside the Unit 4 building was discovered to contain an abandoned 6-inch diameter pipe formerly connected to the roof drain. This pipe discharged directly to the aforementioned discharge flume. The pipe was immediately sealed with expandable foam and capped with a blank flange. Once the pipe was sealed, the oily sheen discharging from the flume to the Mystic River dissipated. Additional response actions involved cleaning the sheet pile walls and down gradient structures that had been impacted by the release. These structures included the Tobin Bridge, Mary O'Malley Park, and the Chelsea Yacht Club.

In total, 10,000 gallons of oily water was recovered and transported by Clean Harbors under manifest to its facility in Portland, Maine. In addition, approximately 14.5 tons of oily solids from the trench cleaning, and approximately 59 tons of oily debris from the down gradient receptors was generated and transported under manifest and disposed of by Clean Harbors at Sawyer Environmental Recovery in Hampden, Maine.

On June 14, 2001, a Class A-1 RAO was achieved.

RECOMMENDATION:	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
The release was addressed and a Class A-1 RAO was filed in accordance with the MCP. As such, no further assessment or remediation is warranted in connection with this AOC.

AOC 11 - RTN 3-22499 Ignition Oil Spill

TYPE OF UNIT: Asphalt-paved road surface

PERIOD OF OPERATION: 2003

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION: Not applicable

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

No. 2 fuel oil

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (L)
	Groundwater (L)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

On January 20, 2003, approximately 187 gallons of No. 2 fuel oil was released when a pressure gauge on a pump malfunctioned (Ref. SM-32). The oil impacted an approximately 300-square foot area of pavement located adjacent to the northwest side of the Unit 6 stack. None of the released oil impacted soil or groundwater. The release was assigned RTN 3-22499.

Under an IRA, from January 20 through 27, 2003, Clean Harbors performed response actions that involved the containment and recovery of the oil using absorbent pads and powder, followed by washing the pavement with detergent solution.

In total, approximately 3 cubic yards of response-related debris and 472 gallons of liquid were generated. The material was transported under manifest by Clean Harbors for disposal at Murphy's Waste Oil Services in Woburn, Massachusetts.

On March 21, 2003, a Class A-1 RAO was achieved. As such, no further action with regard to this release is warranted at this time.

RECOMMENDATION:		
	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
The release was addressed and a Class A-1 RAO was filed in accordance with the MCP. As such, no further assessment or remediation is warranted in connection with this AOC.

AOC 12 - RTN 3-17387

TYPE OF UNIT: Within the berm for Tank Nos. 1 and 2

PERIOD OF OPERATION: Unknown to Present

PHOTOGRAPH NUMBER(S): 08

PHYSICAL DESCRIPTION AND CONDITION: Not applicable

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

No. 2 fuel oil

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (L)
	Groundwater (L)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

On October 7, 1998, approximately 25 gallons of No. 2 fuel oil was released when a hose line ruptured within the bermed area for Tanks 1 and 2 (Refs. SM-21, SM-22). The oil impacted soil and trap rock within the bermed area of Tanks 1 and 2 on the southeastern portion of the Facility. The release was assigned RTN 3-17387. Although this release occurred within the boundary of RTN 3-12140 and RTN 3-17789, this release was not linked to these previous releases.

Under an IRA, on October 7, 1998, Clean Harbors excavated approximately 4 cubic yards of oil-impacted soil (Ref. SM-22). On October 8, the excavated material was transported under manifest for disposal to the Clean Harbors facility in Braintree, Massachusetts. On October 15, 1998, GZA collected a confirmatory soil sample from the base of the excavation for VPH/EPH analysis. The laboratory reported analytical data indicating that VPH was not detected above the laboratory method reporting limits. However, EPH was detected, but not at concentrations exceeding the applicable MCP Method 1 S-2 Standards. GZA concluded that based on the location of the release (on the north side within the Tanks 1 and 2 bermed area) that the residual EPH constituents represented background conditions.

On December 7, 1998, a Class A-1 RAO was achieved. As such, no further action with regard to this release is warranted at this time.

RECOMMENDATION:		
	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
The release was addressed and a Class A-1 RAO was filed in accordance with the MCP. As such, no further assessment or remediation is warranted in connection with this AOC.

AOC 13 - Tetrachloroethylene in Groundwater

TYPE OF UNIT: Groundwater

PERIOD OF OPERATION: Unknown

PHOTOGRAPH NUMBER(S): 03 (general area)

PHYSICAL DESCRIPTION AND CONDITION: Not applicable

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Tetrachloroethylene

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (L)
	Groundwater (H)	Subsurface Gas (M)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

During the groundwater investigation performed to achieve clean closure of the former surface impoundments, PCE was detected in monitoring wells at concentrations ranging from 9 µg/L to 350 µg/L (Refs. SM-12, SM-20). As previously described, the surface impoundments could not be confirmed as the source of PCE. However, in the Groundwater Closure Performance Report prepared by ABB in April 1991, ABB stated that the detected PCE "may be associated with a spill, which occurred in 1986 or 1987, from pumping out the oil collection tank of the oil/water separator, via the pump out connection located between the surge tank and the Eastern Gas building. Or perhaps the presence of PCE is due to historical use of this chemical in the Eastern Gas storage building area" (Ref. SM-08). As such, an off-site location may be the source of the PCE present in groundwater beneath the Facility.

The concentrations of PCE in groundwater were re-evaluated based on the risk-based remediation standards issued in the 1993 MCP; these standards were not available for comparison in 1991 (Ref. SM-20). As such, on September 9, 1997, ABB compared the historical PCE concentrations to the risk-based groundwater standards and determined that the detected PCE concentrations were below the existing MCP Method 1 GW-2 and GW-3 remediation standards of 3,000 µg/L and 5,000 µg/L, respectively. The current MCP Method 1 GW-2 and GW-3 remediation standards for PCE are 50 µg/L and 30,000 µg/L, respectively.

The file material suggests that groundwater samples have not been collected for PCE analysis since 1991. As such, it is recommended that groundwater samples be analyzed for PCE to confirm that PCE concentrations have not exceeded the risk-based remediation standards since the most recent investigation in 1991.

RECOMMENDATION:	No Further Action	( )
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	(X)

COMMENTS:
Groundwater samples should be collected in the area of the former surface water impoundments to assess whether PCE is present in groundwater at concentrations exceeding applicable groundwater standards.

AOC 14 - Former Transformers 1, 2, 3, 4, 5, 6 and 11

TYPE OF UNIT: Transformer

PERIOD OF OPERATION: Unknown to 1989 and early 1990's

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION:

These former transformers were PCB-filled (PCB concentration was greater than 500 ppm) and were located in the vicinity of the exterior southern wall of the Unit 1 building

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

PCBs

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H) Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

According to the Preliminary Assessment Report prepared by Wehran Engineers, Transformer No. 6 failed in 1981, resulting in the release of 3,715 gallons of PCB-contaminated MODF (Ref. SM-08). The MODF contained 60% PCBs and 40% trichlorobenzene solvent. Transformer No. 6 was replaced in the late 1980's or early 1990's (Ref. SM-19). No specific information about the remedial action(s) performed for this release was available in the file material or from Facility representatives.

On February 16, 1984, approximately 50 gallons of Chlorextal liquid (60% PCB, 40% solvent) was released from Transformer No. 2 (Ref. SM-03). In response to the release, soil and gravel impacted with PCBs was excavated by Clean Harbors to depths ranging from 2 to 5 feet below the ground surface. A total of 28 samples were analyzed from the base of the excavation area and analyzed for PCBs. The data indicated that PCB concentrations at the base of the excavation ranged from 4 to 44 parts per million. In addition, a portion of the asphalt-paved roadway impacted by the release was excavated. A composite soil sample was collected at 6-inches below the ground surface at the base of the roadway excavation and analyzed for PCBs. The data indicated that the residual PCB concentration was 11 parts per million. The excavation was then backfilled under the direction of the MassDEP.

In total, 289 cubic yards of PCB-impacted media were removed and transported under manifest by Clean Harbors to SCA in Model City, New York. In addition, the transformer carcass and clean-up equipment was transported to Emelle, Alabama.

On June 23, 1987, EPA issued a consent order to the Facility in regard to the discovery of two transformers leaking Askarel to the environment (Ref. SM-09). The consent order stated that the transformers had leaked since at least August 10, 1981. Although the transformer numbers are

not provided, accompanying file material suggests that the leaking transformers were Nos. 1 and 3 (Ref. SM-20).

There is no information regarding the remediation of the soil impacted by this release until 1989 (Ref. SM-09). A BECo letter dated February 21, 1989, and addressed to the MassDEP indicates that 209 cubic yards of impacted soil and gravel had been excavated to a depth of approximately 40 inches below the ground surface, and that residual PCB concentrations in soil were below 25 parts per million. Furthermore, the letter states that two concrete transformer foundations had been decontaminated such that the surface PCB concentration was below 100 µg/100 square centimeters. However, the letter does not indicate the transformer numbers where these remedial activities had occurred. The letter goes on to say that three remaining transformers (presumably Nos. 4, 5 and 11) would be replaced with non-PCB transformers no later than July 1989, and that clean-up standards of 25 ppm for soil and 100 µg/100 square centimeters for concrete surfaces would be used. In addition, the letter states that Askarel had been released from transformers 1, 3, 4, 5 and 11 and had impacted an area of approximately 2,695 square feet. No further information about the performance or completion of remedial actions was available in the file material.

On August 1, 1997, ABB installed two groundwater wells (MW-1 and MW-2) down gradient from the former transformer area during an ASTM Phase II Assessment. The wells were installed to presumably assess whether these historical Askarel releases impacted soil or groundwater, (Ref. SM-20). In addition, ABB oversaw Geosearch advance six soil borings (SB-1 through SB-6) around the southern perimeter of the former transformer area. The borings were advanced up to 15 feet below the ground surface, expect for SB-6, which hit refusal at 6 feet below the ground surface. Soil samples were collected from 5 to 15 feet at 2-foot intervals. (It is unclear why soil samples were not also collected at 0-5 feet.) The collected soil samples were analyzed for VOCs using a PID, and one to two samples from each boring with the highest PID readings were submitted to BECo's analytical laboratory in Watertown, Massachusetts for analysis of TPH using EPA Method 8100 and PCBs using EPA Method 8080, while two samples were analyzed for VPH and EPH using the MassDEP Method. The groundwater wells were sampled on August 5, 1997, and analyzed by the BECo Watertown Laboratory for PCBs, VPH, and EPH.

For the collected soil samples, the laboratory reported analytical data indicating that PCBs were detected at concentrations less than 2 mg/kg from soil borings SB-2, SB-3 and SB-4, while low levels of EPH and VPH fractions were detected in the soil sample collected from SB-2. However, none of the applicable MCP Reportable Concentrations were exceeded. As such, no further analysis or remedial action was determined to be warranted with respect to residual concentrations of PCBs, EPH and VPH in soil. For the collected groundwater samples, the data indicated that VPH and EPH were not detected above laboratory method reporting limits, but that PCBs were detected at 0.16 µg/L in MW-1 and at 0.1 µg/L in MW-2. These concentrations were below applicable MCP Reportable Concentrations and the unrestricted use criteria of 0.5 µg/L for PCBs in groundwater under 40 CFR 761.

Based on the investigation conducted by ABB in 1997, historic releases of PCB-contaminated MODF from Transformer Nos. 1, 2, 3, 4, 5, 6, and 11 have occurred. The presence of PCBs at a concentration of 11 parts per million in soil under a portion of the roadway (presumably to the south of the Unit 1 building) may necessitate an investigation under 40 CFR 761.

RECOMMENDATION:	No Further Action	( )
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	(X)

COMMENTS:
Based on the information provided in the file material, there is insufficient information to support compliance with the cleanup regulations specified under 40 CFR 761. The Facility should provide information to justify compliance with 40 CFR 761 or perform an evaluation to determine compliance with applicable regulations.

AOC 15 – RTN 3-13744

TYPE OF UNIT: Hydraulic oil release to the Mystic River

PERIOD OF OPERATION: Unknown

PHOTOGRAPH NUMBER(S): None

PHYSICAL DESCRIPTION AND CONDITION: Not applicable

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Hydraulic oil

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (L)
	Groundwater (L)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

On May 9, 1996, approximately 19 gallons of hydraulic oil was released from an intake screened well located on the southwestern portion of the Facility, adjacent to the Mystic River (Ref. SM-19). The majority of the oil (volume not specified) was contained in the well, but an oil sheen was observed on the Mystic River. A vactor was used to remove the oil from the well. A Class A-1 RAO was achieved on July 10, 1996. No further information regarding this release was present in the file material. However, based on the issuance of the Class A-1 RAO, no further investigation with respect to this release is warranted.

RECOMMENDATION:	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
The release was addressed and a Class A-1 RAO was filed in accordance with the MCP. As such, no further assessment or remediation is warranted in connection with this AOC.

AOC 16 – RTN 3-17445

TYPE OF UNIT: Impacted soil

PERIOD OF OPERATION: 1998

PHOTOGRAPH NUMBER(S): 11 (general area)

PHYSICAL DESCRIPTION AND CONDITION:

A sulfuric acid pipeline was located adjacent to the wastewater treatment settling pond in the southern portion of the Facility. The diameter, age, and point of origin of the pipeline was not reported in the file material. The area beneath the pipe was gravel.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The pipeline carried 93.7% sulfuric acid, presumably for use in the wastewater treatment plant operation.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L) Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

On October 17, 1998, approximately 10 gallons of 93.7% sulfuric acid was released when a valve on the pipeline failed. The volume of released sulfuric acid constituted a release notification with the MassDEP. The release impacted approximately 340-square feet of gravel underlying the pipeline valve and the underlying soil.

Release response activities involved the application of soda ash to neutralize the acid in the gravel and underlying soil to a depth of approximately 6-12 inches below the ground surface. The impacted gravel and soil was excavated and contained in a roll-off box (approximately 12 tons of material) and in six 30-gallon drums and transported under manifests MAK 785674 and MAK790706 to the Clean Harbors facility in Braintree, Massachusetts for disposal on December 10 and October 03, 1998, respectively. Three soil samples collected from the limits of the excavation indicated that the pH is the soil ranged from 3.2 to 7.5, with an average of 5.83. The background soil pH was 6.4 and 7.3. Based on these data, the excavation was backfilled (origin of backfill material not specified).

A risk characterization performed according to the MCP concluded that a level of No Significant Risk and a Permanent Solution had been achieved. As such, a Class A-2 RAO had been achieved.

RECOMMENDATION:	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
The release was addressed and a Class A-2 RAO was filed in accordance with the MCP. As such, no further assessment or remediation is warranted in connection with this AOC.

AOC 17 – RTN 3-22934

TYPE OF UNIT: Outdoor electrical substation

PERIOD OF OPERATION: 2003

PHOTOGRAPH NUMBER(S): 36, 38

PHYSICAL DESCRIPTION AND CONDITION:

A 25 kilovolt transformer containing an unspecified volume of No-PCB (less than 1 part per billion PCB) MODF was located in the 115 kilovolt outdoor electrical substation operated by NStar. The substation is located in the western portion of the Facility.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The transformer contained mineral oil dielectric fluid (MODF).

RELEASE PATHWAYS:	Air (L)	Surface Water (L)	Soil (H)
	Groundwater (L)	Subsurface Gas (L)	

HISTORY AND/OR EVIDENCE OR RELEASE(S):

On June 17, 2003, approximately 30 gallons of MODF was released to the environment during maintenance work performed on the transformer by NStar personnel. The release impacted approximately 40-feet of gravel and soil to a depth of approximately 4 feet below the ground surface. The release volume constituted a notification to the MassDEP.

Remedial response activities involved excavating impacted gravel and soil into a roll-off container by Cyn Environmental. NStar personnel collected two soil samples from the limits of the excavation and screened the samples for TPH. The data indicated that the TPH concentration was 1,716 ppm and 1,842 ppm.

This release occurred within the area of RTN 3-20199, which was an existing Tier II site. NStar concluded that the screening data indicated that the excavation of soils impacted by the June 17, 2003 release had returned the release area to pre-existing conditions. As such, no confirmatory soil samples were collected.

On June 18, 2003, approximately 10 cubic yards of impacted soil and gravel were transported under manifest MAQ 389614 to the Cyn facility in Stoughton, Massachusetts.

A risk characterization performed according to the MCP concluded that a level of No Significant Risk had been achieved. As such, a Class A-2 RAO was achieved. A Class A-1 RAO for the release was not relevant as the release occurred within the boundary of an active disposal site (RTN 3-20199) that had not attained a condition of No Significant Risk.

RECOMMENDATION:	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
The release was addressed and a Class A-2 RAO was filed in accordance with the MCP. As such, no further assessment or remediation is warranted in connection with this AOC.

AOC 18 – RTN 3-22863

TYPE OF UNIT: Outdoor electrical substation

PERIOD OF OPERATION: 2003

PHOTOGRAPH NUMBER(S): 36, 38

PHYSICAL DESCRIPTION AND CONDITION:

A 115 kilovolt transformer containing an unspecified volume of no-PCB (less than 1 part per billion PCB) was located in the 115 kilovolt outdoor electrical substation operated by NStar. The substation is located in the western portion of the Facility.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The transformer contained mineral oil dielectric fluid (MODF).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H) Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

On May 1 and 15, 2003, approximately 100 gallons of MODF was released to the environment during the filling and installation of the transformer by NStar personnel. The release impacted a 540-square foot area of gravel and soil on the north side of the transformer and a 225-square foot area to the south of the transformer. Both releases impacted the underlying soil to a depth of approximately 2-foot below the ground surface. In addition, a concrete vault below the transformer was observed to contain water and MODF on the surface of the water. The release volume constituted a notification to the MassDEP.

Remedial response activities involved excavating approximately 40-cubic yards of impacted gravel and soil into a roll-off container and vacuuming approximately 308-gallons of oily water and oil from the vault by Cyn Environmental. NStar personnel collected a total of three soil samples from the limits of the excavations and screened the samples for TPH. The data indicated that the TPH concentration ranged from 734 ppm to 3,200 ppm.

This release occurred within the area of RTN 3-20199, which was an existing Tier II site. As such, NStar concluded that the screening data indicated that the excavation of soils impacted by the May 1 and 15, 2003, release had returned the release area to pre-existing conditions. As such, no confirmatory soil samples were collected.

On May 16, 2003, the impacted soil and gravel was transported under manifest MAQ 393142 and MAQ 393143, and the oily liquid under MAQ 392832 to the Cyn facility in Stoughton, Massachusetts.

A risk characterization performed according to the MCP concluded that a level of No Significant Risk had been achieved. As such, a Class A-2 RAO had been achieved. A Class A-1 RAO for the release was not relevant as the release occurred within the boundary of an active disposal site (RTN 3-20199) that had not attained a condition of No Significant Risk.

RECOMMENDATION:	No Further Action	(X)
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
The release was addressed and a Class A-2 RAO was filed in accordance with the MCP. As such, no further assessment or remediation is warranted in connection with this AOC.

AOC 19 – RTN 3-20199

TYPE OF UNIT: Outdoor electrical substation

PERIOD OF OPERATION: Unknown to Present

PHOTOGRAPH NUMBER(S): 36, 38

PHYSICAL DESCRIPTION AND CONDITION:

The NStar 115 kilovolt outdoor electrical switchyard is located on the west side of the Facility and occupies approximately 4.75 acres (Ref. SM-51). The substation is known as Substation 250. A locked chain-linked fence surrounds the substation. The interior of the substation includes numerous transformers, breakers, an 18 kilovolt switch house, a 14 kilovolt switch house with an office, a 25 kilovolt switch house, several metal storage sheds, and gravel-covered surfaces. NStar operates the substation, which occupies land owned by USPowerGen.

As reported by GZA, the substation is approximately 3 meters above sea level. Surface water run-off within the substation flows to catch basins which discharge to the Mystic River. Groundwater is present between 3 and 8 feet below the ground surface. The groundwater elevation was reported to fluctuate between 0.5 to 3 feet between June and October 2003. The groundwater flow direction was reported to be from the northwest to the southeast. GZA measured the hydraulic gradient at 0.012 ft/ft, while the hydraulic conductivity was estimated at 1 foot per day. Based on these values, a horizontal seepage velocity was estimated at 14.4 feet per year.

The ground surface is composed of gravel (up to 4 feet thick) overlying 5-10 feet of granular fill. The fill is composed of sand, gravel and minor amounts of silt. The fill material consists of brick, glass, concrete debris, coal cinders, coal ash, and metal debris. Greenish-gray organic silt and clay deposits were observed beneath the fill and in selected shallow (approximately 5 feet bgs) locations (Ref. SM-51).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Substation 250 has been the location of numerous releases of MODF and PCBs. Currently, none of the electrical equipment contains PCBs.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H) Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OR RELEASE(S):

Utility Release Abatement Measure

As part of a Utility Release Abatement Measure (URAM) at Substation 250, Levine Fricke Remediation (LFR; environmental consultants to Sithe) collected a soil sample in the vicinity of an area where new electrical equipment related to the operation of Mystic 8&9 was to be located.

The soil sample contained PCBs at 3 mg/kg, which exceeded the MassDEP RCS-2 Reportable Concentration of 2 mg/kg. As such, LFR notified MassDEP on November 30, 2000. The release was assigned RTN 3-20199 (Ref. SM-51). The source of this release was not specified, but was assumed not to be affiliated with a TSCA-regulated source.

As part of the URAM, on March 20 and 27, 2001, LFR collected 105 soil samples along a proposed trench for electrical distribution lines and 2 soil samples from a proposed transformer foundation footprint. The data indicated that PCBs (present as Aroclors 1254 and 1260) were present at concentrations above 2 mg/kg (the MassDEP RCS-2) in soil samples collected from proposed trenches 2 and 8. However, the concentrations were below 50 mg/kg and, as such, were not considered PCB Remediation Waste under 40 CFR 761. Subsequently, the trenches were excavated and disposed of off-site. In total, 2,277 cubic yards (3,416 tons) of soil was excavated and transported under manifest or bills of lading to one of five waste disposal facilities. As such, no further investigation for this area is warranted.

RTN 3-21131

On October 4, 2001, a trailer-mounted mobile transformer located between the 14 and 18 kilovolt switch houses exploded, caught on fire, and released approximately 2,500 gallons of non-PCB MODF (Ref. SM-51). The release was issued RTN 3-21131.

Response actions were completed under an IRA and involved the excavation of approximately 25 cubic yards of impacted soil and gravel, which were transported off-site for disposal by Clean Harbors. Confirmatory soil samples were collected from the limits of the excavation for PCB and MODF analysis. The data indicated that PCBs were present in soil nearest the 14 kilovolt switch house at concentrations exceeding the applicable cleanup standards. The source of the PCBs was thought to be related to historical releases, because the mobile transformer did not contain PCBs. The area of soil with the elevated PCB concentrations was subsequently excavated; approximately 4 cubic yards was removed and transported off-site for disposal. A Class A-2 RAO was issued on December 3, 2001. As such, no further remedial actions or investigations are warranted with respect to the release of no-PCB MODF from the mobile transformer.

Phase I Initial Site Investigation

On behalf of NStar, GZA conducted Phase I initial site investigation activities in April 2001 (Ref. SM-51). The purpose of the investigation was to assess soil from areas where visual staining was present on the surficial gravel. A total of 35 soil samples were collected from 1.5 to 4.5 feet below the ground surface on April 23, 2001, and May 3, 2001, for PCB analysis. A subset of the samples was also analyzed for EPH. In addition, three 4-inch diameter groundwater monitoring wells (GZ-1, GZ-2, GZ-3) were installed. On October 4 and 11, 2001, an approximately 0.36 inch layer of petroleum was observed floating on the surface of the groundwater present in GZ-2. The thickness of the petroleum warranted notification, and the MassDEP issued RTN 3-21688 for this release. However, this release was subsequently linked to RTN 3-20199, as NStar planned to address both releases further under a Phase II investigation. Groundwater samples were also collected from GZ-1 and GZ-3 for PCB and EPH analysis.

The results of the Phase I initial site investigation indicated that the Site was classified as Tier II. In soil, four out of 35 samples contained PCBs at concentrations equal to and above 2 mg/kg (the MassDEP Method 1 standard); the concentrations ranged from 2 mg/kg to a maximum of 6.5 mg/kg (sample ID T-110D-3-2). In addition, four of 15 soil samples contained EPH fractions above the Method 1 S-3/GW-3 standards. In groundwater, PCBs and EPH fractions were not detected above the laboratory method reporting limits in samples collected from GZ-1 or GZ-3.

Based on the Phase I results, a Phase II investigation was performed to further assess the nature and extent of PCB and EPH impacts identified in soil and groundwater during the Phase I investigation.

Phase II Site Investigation

In June and November 2003, GZA conducted Phase II investigations. The investigation involved collecting 14 soil samples for PCB analysis (three samples were analyzed for EPH and target PAHs). The soil samples were collected from areas where the Phase I investigation determined PCBs were present. In addition, five 2-inch diameter groundwater wells (GZ1-101 through GZ-105) with screened intervals at 5-15 feet below the ground surface were installed. Groundwater from five new wells and the three original wells (GZ-1, GZ-2, and GZ-3) was collected for PCB and EPH analysis on June 16, 2003. The wells GZ-2 and GZ-102 contained floating petroleum hydrocarbons and were not sampled. However, by October 2003 there was no free product present in GZ-2, so the well was subsequently sampled on November 10, 2003.

In soil, the data indicated that PCBs were present above the MassDEP Method 1 criteria (2 mg/kg) in four of 14 soil samples. The soil samples with elevated PCB concentrations were all collected from the area near the 14 kilovolt switch house. The maximum detected PCB concentration was 24 mg/kg. However, the source of the PCBs in soil was not specified. Three soil samples contained elevated target PAHs, but the source of the PAHs was considered to be from the fill (coal ash) underlying the substation.

In groundwater, neither EPH nor PCBs were detected above the respective laboratory method reporting limits. In addition, on August 13, 2002, a 30-inch diameter well installed adjacent to GZ-102 was assessed for free petroleum hydrocarbons for a week-long period. The observation results indicated that petroleum hydrocarbons were no longer present on the surface of the groundwater.

Based on these data, GZA performed a risk characterization according to the MCP and concluded that a level of No Significant Risk for Human Health and a Condition of No Significant Risk to the Environment had been achieved. As such, the requirements for a Class A-2 RAO were achieved.

RECOMMENDATION:	No Further Action	( )
	Interim Measures	( )
	Confirmatory Sampling	( )
	RFI Necessary	(X)

COMMENTS:
Based on the information provided in the file material, there is insufficient information to support compliance with the cleanup regulations specified under 40 CFR 761. The original source of the PCBs remaining in soil at 24 mg/kg is unclear. As such, the Facility should provide information to justify compliance with 40 CFR 761.

7.0 REFERENCES

Documents Log
Mystic Station – Charlestown, MA – Everett, MA

Document Date	Title	Author	Ref. SM-#
1981 January 12	Site Plans	Stone & Webster Engineering	01
1983 March 29	Appendix 1-B – Part A Permit Application and Appendices		02
1984 May 24	PCB Transformer Spill at Mystic Generating Station	Boston Edison Company	03
1985 November 7	Exposure Information Report	Chas. T. Main, Inc. Boston, MA	04
1986 July 14	Part B Permit – NOD Response		05
1987 April 17	Notices of Non-Compliance	Commonwealth of Mass. Dept. of Env. Qual. Engineering and Boston Edison	06
1987 June	Site Analysis	US EPA	07
	FIT Report		08
1989 February 21	Application Completed Hazardous Waste Cleanup PCBs	Joel Y. Kamya VP Production Operations	09
1989 to Present	Table 12, Mystic I, LLC – Mystic Station Summary of Historical Facility Spills (1989 to Present) from Integrated Contingency Plan Pages 58 and 59	Triton Environmental, Inc.	10
1990 August 23	Closure Performance Report – Soils, Mystic Station Addendum No. 2 Evaluation of Confirmatory Sampling	ABB Environmental Services	11
1991 April	Groundwater Closure Performance Report Mystic Station, Everett, MA	ABB Environmental Services	12
1992 May 27	Office Memorandum - Closure Performance Reports	J.P. Seferiadis Boston Edison Company	13

Document Date	Title	Author	Ref. SM-#
1992 November 4	Office Memorandum – Closure Certification Mystic Station	J.P. Seferiadis Boston Edison Company	14
1993 January 21	Office Memorandum – Mystic Station Closure Letter Attached DEP Mystic Station Closure Letter dated May 6, 1992	N. Rabadjija	15
1994 January 13	Response Action Outcome Statement Report (310 CMR 40.1056)	Duncan Wood, LSP No. 8765 Environmental Science Services	16
1994 March 10	Waste Water Spill Incident – January 13, 1994 Mystic Station	T.J. Bedard	17
1994 March 11	Wastewater Release to Mystic River DEP Case No. 3-10431	John P. Seferiadis, PE, LSP Senior Envir. Engineer	18
1997 May 8	ASTM Phase I Environmental Site Assessment Report	Raytheon Environmental Services	19
1997 September 9	ASTM Phase II Assessments – Mystic Station Addendum	ABB Environmental Services	20
1998 October 7	Draft copy – Spill Report and 11-24-2008 DEP Ltr received oral notification of release		21
1998 December 7	Class A-1 Response Action Outcome Statement	GZA GeoEnvironmental	22
1999 April 21	Immediate Response Action Completion Statement Tank #1 & #2 Containment Dike Everett, MA	Clean Harbors Environmental	23
1999 July	MCP Phase IV Modification to Remedy Implementation Plan (RIP)	GZA GeoEnvironmental, Inc.	24
1999 November 5	Immediate Response Action (IRA) Sithe Mystic, LLC Charlestown, MA	GZA GeoEnvironmental, Inc.	25
1999 December	Limited Environmental Site Assessment Update	GZA GeoEnvironmental, Inc.	26
2000 August	Volume I of IV Phase IV Final Inspection Report (FIR) and Class C Response Action Outcome (RAO)	GZA GeoEnvironmental, Inc.	27

Document Date	Title	Author	Ref. SM-#
2000 August	Phase IV Final Inspection Report (FIR) and Class C Response Action Outcome Statement	GZA GeoEnvironmental, Inc.	28
2000 September 20	Certificate Storm Water Notice of Intent Permit No. MAR05B587	EPA	29
2001 June	Immediate Response Action (IRA) Completion Report and Response Action Outcome (RAO) Statement RTN 3-19849 Sithe Mystic Station Everett, MA	GZA GeoEnvironmental, Inc.	30
2001 August 22	Authorization to Discharge Permit No. MA0004740 2001 Reissuance Page 1 of 22	DEP	31
2003 March 21	Response Action Outcome (RAO) Statement Ignition Oil Spill	GZA GeoEnvironmental, Inc.	32
2004 May 31	Sithe Mystic Massachusetts Contingency Plan Compliance Report		33
2005 August 9	Class A-3 Response Action Outcome Statement (GBC Bound Rpt)	GZA GeoEnvironmental, Inc.	34
2006 June 30	DEP Ltr – Minor Modification of Operating Permit	James Belsky	35
2006 September	Wastewater Treatment Plant Operations and Maintenance Manual Boston Generating Mystic I LLC		36
2007 January 2	Immediate Response Action Completion Report and Class A-2 Response Action Outcome Statement RTN 3-25900 NSTAR Station 250 115 kV Switchyard 173 Alford Street Charlestown, MA	Lightship Engineering, LLC	37
2007 June	Sewer Use Discharge Permit Application Mystic Units 8 and 9 Natural Gas Fired Combined Cycle Power Plant (GBC Bound Rpt)	Triton Environmental, Inc.	38

Document Date	Title	Author	Ref. SM-#
2007 August 6	Sewer Use Discharge Permit Issued Cover Page only	MWRA	39
2008 April 16	Post-RAO Operation, Maintenance and/or Monitoring Report No. 14	GZA GeoEnvironmental, Inc.	40
2008 August 7	Post-RAO Operation, Maintenance and Monitoring Report	GZA GeoEnvironmental, Inc.	41
2008 November	Stormwater Pollution Prevention Plan (SWPPP) Boston Generating, LLC Mystic I, LLC,173 Alford St. Charlestown, MA (3-ring binder)	Triton Environmental, Inc.	42
2008 November	Stormwater Pollution Prevention Plan (SWPPP) Boston Generating, LLC Mystic Station, Units 8 & 9, 173 Alford St. Charlestown, MA (3-ring binder)	Triton Environmental, Inc.	43
2008 September 16	Sanborn Maps dated 1950, 1955, 1970 and 1972	Environmental Data Resources, Inc.	45
2008 December 10	Mabbett & Associates, Inc. Visual Site Inspection		46
January 23, 2009	Post-RAO Operation, Maintenance and Monitoring Report	GZA GeoEnvironmental, Inc.	47
December 14, 1998	Response Action Outcome Statement, Sulfuric Acid Release, RTN 3-17445	Clean Harbors Environmental Services, Inc.	48*
June 13, 2003	Response Action Outcome Completion Report, MODF Release, NStar Station 250, RTN 3-22934	NStar	49*
May 27, 2003	Response Action Outcome Completion Report, MODF Release, NStar Station 250, RTN 3-22863	NStar	50*
December 2003	Class A-2 Response Action Outcome Statement, NStar Substation 250, RTN 3-20199	GZA	51*

* - Out of chronological sequence.

FIGURE 1

Mystic Station Facility Location Map

U S P O W E R G E N

173 ALFORD STREET CHARLESTOWN, MASSACHUSETTS

Mabbett & Associates
Environmental Consultants & Engineers

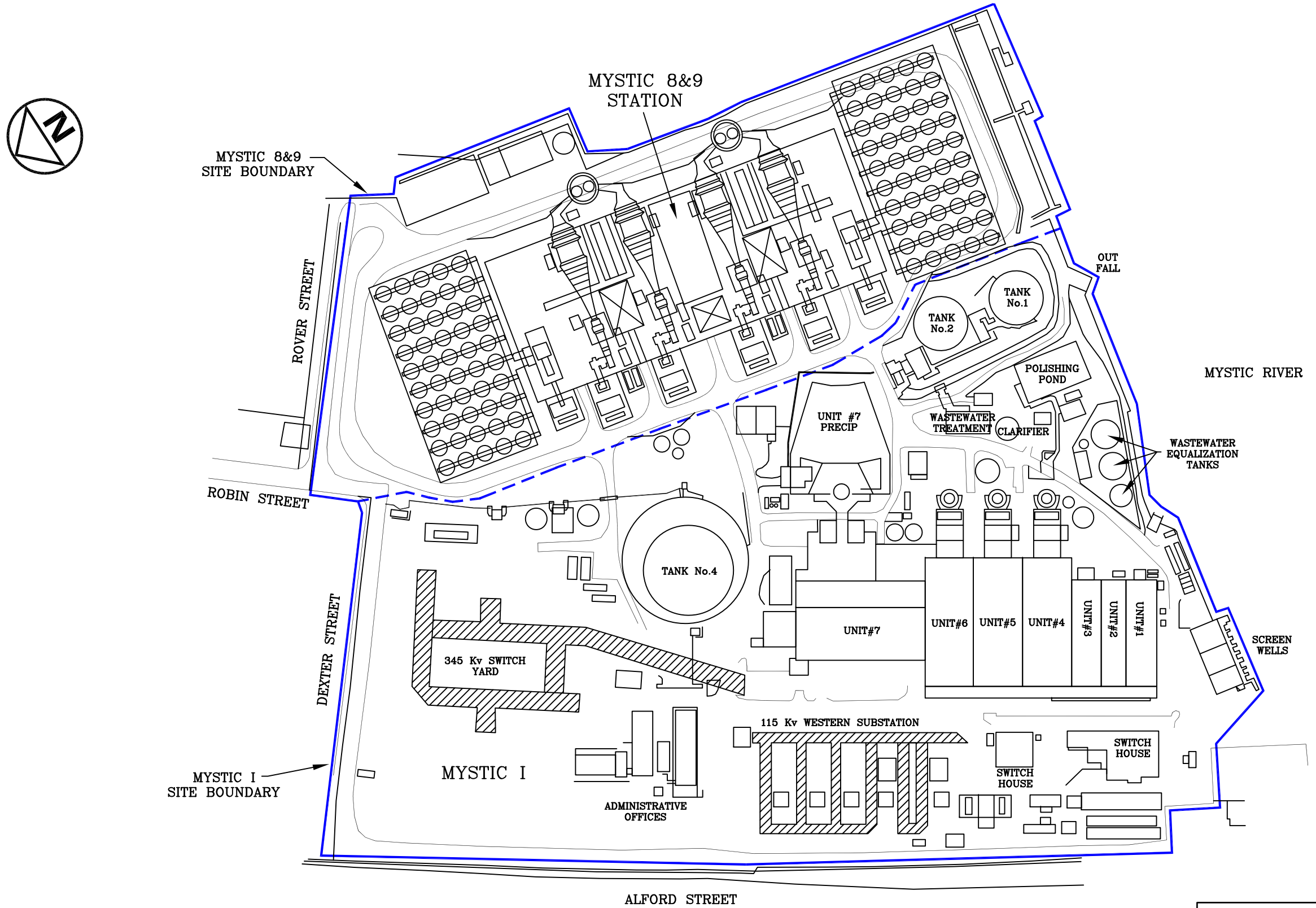
SITE LOCUS MAP

DWG. NO. L-1

DRAWN DJA	APPROVED KBS	SCALE 1=2500	PROJ. NO. 7051012.003

FIGURE 2

Mystic Station Facility Site Plan



SOURCE:
FIGURE L-2 IS BASED ON DRAWING FIGURE G-1,
PRELIMINARY LAYOUT BY STONE & WEBSTER ENGINEERING
CORPORATION, ISSUED 11/12/98.

NO.	DATE	DESCRIPTION	DRN	CHK	APP
		REVISION			

U S P O W E R G E N

173 ALFORD STREET CHARLESTOWN, MASSACHUSETTS

Mabbett & Associates
Environmental Consultants & Engineers

SITE PLAN

DWG. NO. L-2

DRAWN DJA | APPROVED AMG | SCALE 1"=200'-0" | PROJ. NO. 7051012.003

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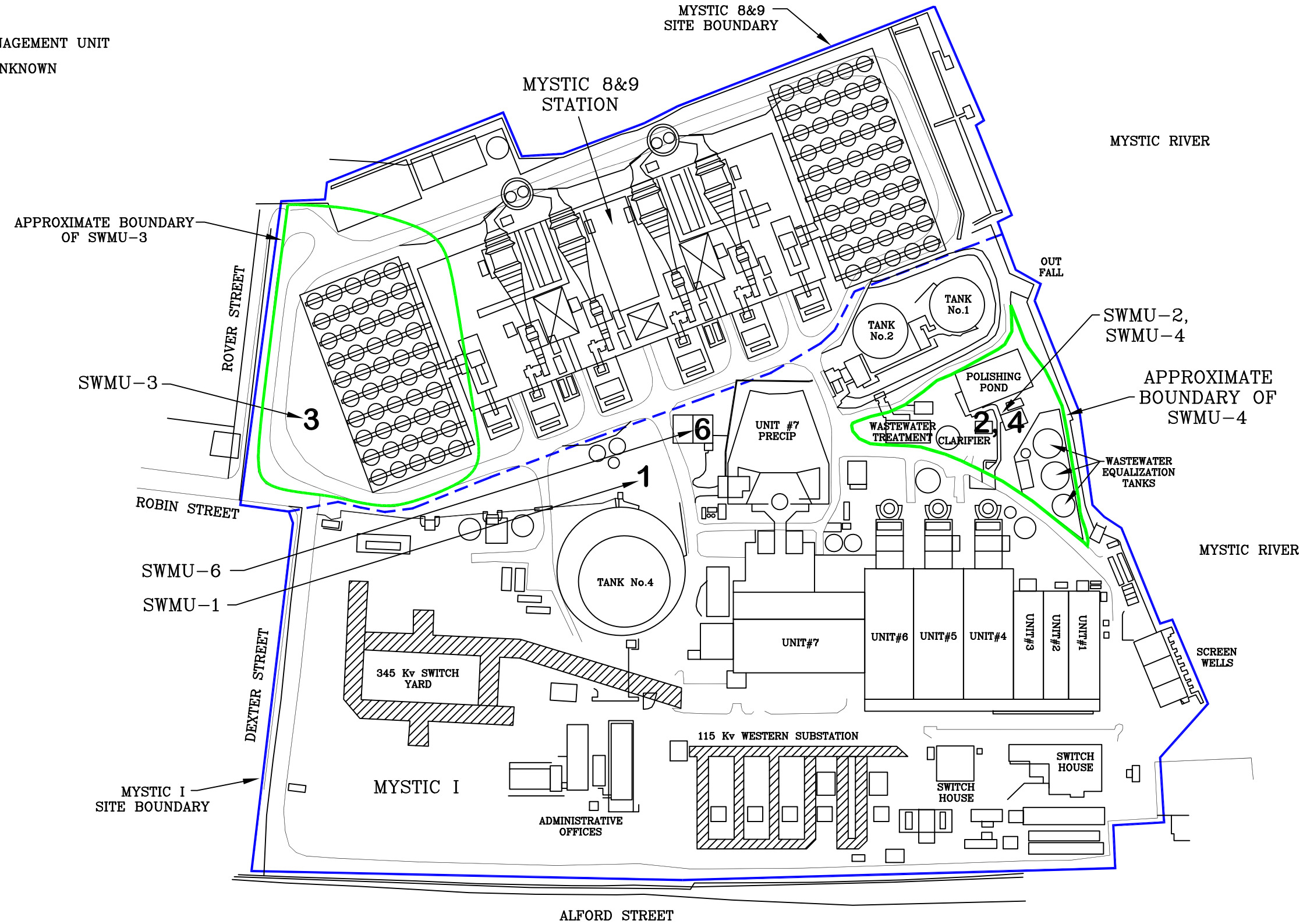
FIGURE 3

Mystic Station Facility SWMU Map

LEGEND

1. SWMU–SOLID WASTE MANAGEMENT UNIT
2. SWMU–5 LOCATION IS UNKNOWN



SOURCE:
FIGURE L–2 IS BASED ON DRAWING FIGURE G–1, PRELIMINARY LAYOUT BY STONE & WEBSTER ENGINEERING CORPORATION, ISSUED 11/12/98.

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173 ALFORD STREET CHARLESTOWN, MASSACHUSETTS

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SWMU LOCATIONS SITE FIGURE

DWG. NO. L–3

DRAWN DJA | APPROVED AMG | SCALE 1"=200'–0" | PROJ. NO. 7051012.003

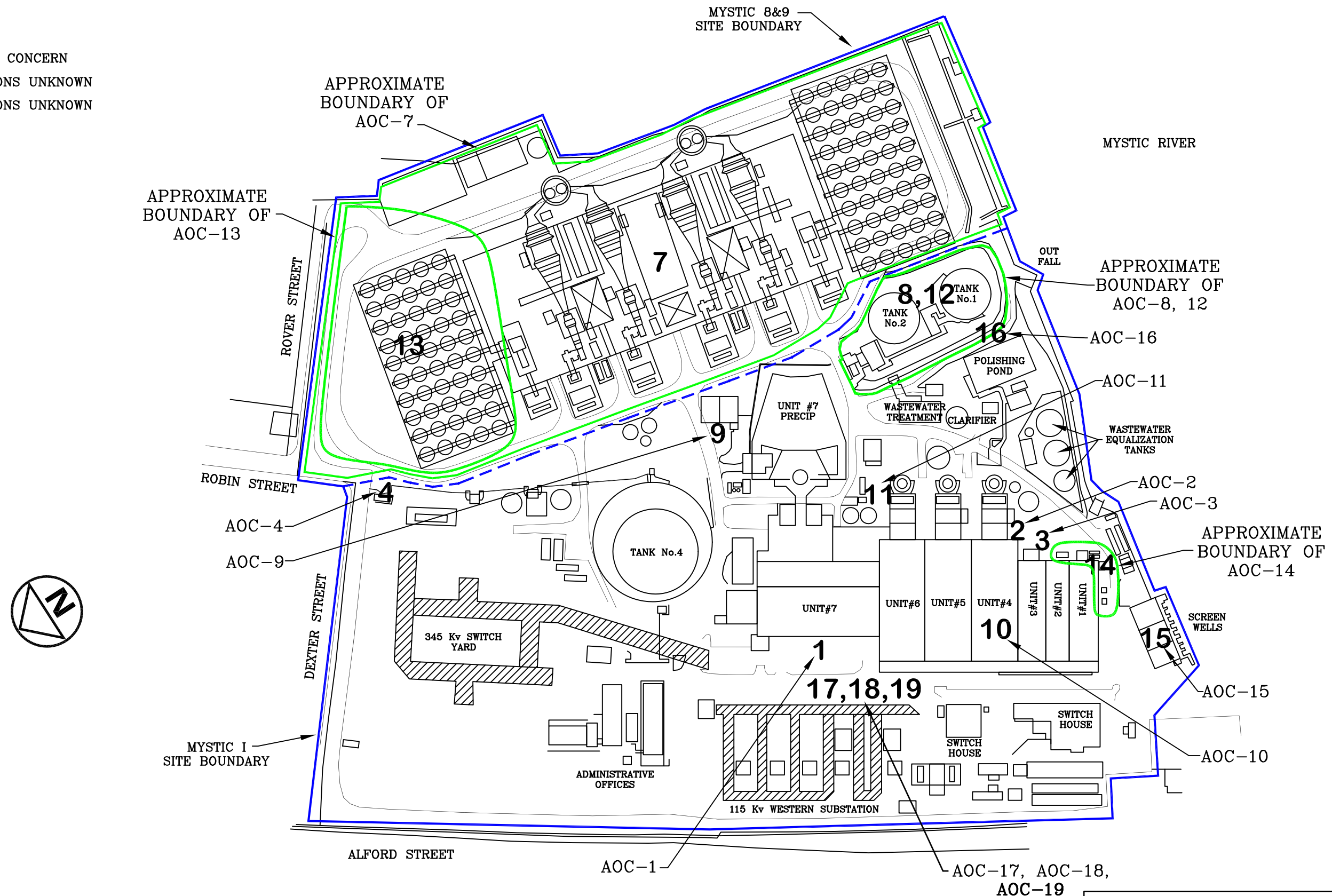
S:\CADD\WORK\RCRA_RFA\Mystic_Station\Sithe_Mystic_SWMU_Site_Plan.dwg – Layout1 – May 14, 2009 4:26pm – dja

FIGURE 4

Mystic Station Facility AOC Map

LEGEND

1. AOC–AREAS OF CONCERN
2. AOC–5 LOCATIONS UNKNOWN
3. AOC–6 LOCATIONS UNKNOWN



SOURCE:
FIGURE L–2 IS BASED ON DRAWING FIGURE G–1, PRELIMINARY LAYOUT BY STONE & WEBSTER ENGINEERING CORPORATION, ISSUED 11/12/98.

NO.	DATE	DESCRIPTION	DRN	CHK	APP
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AOC LOCATIONS SITE FIGURE

DWG. NO. L–4

DRAWN DJA | APPROVED AMG | SCALE 1"=200'–0" | PROJ. NO. 7051012.003

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ATTACHMENT 1

Mystic Station
Solid Waste Management Unit (SWMU) and
Areas of Concern (AOC) List

Mystic Station

Solid Waste Management Unit (SWMU) and
Areas of Concern (AOC) List

SWMU

1. Oil Separator Pit/Former 1,000-gallon Waste Oil UST
2. RTN 3-10431 (Waste Treatment Plant Storage Tank Farm)
3. Former Wastewater Surface Impoundments
4. Former and Current Wastewater Treatment System
5. Former Coal Ash Pile
6. Fly Ash Basin

AOC

1. Unit 7 Transformer Area
2. Unit 4 Building, Stained Areas
3. Abandoned Sump Outside Unit 3
4. RTN 3-12422
5. Abandoned Underground Storage Tanks
6. Spill of Unknown Location
7. RTN 3-0923, RTN 3-18553, RTN 3-18717
8. RTN 3-12140, RTN 3-17789
9. Former Fly Ash Storage Basin Pump Room
10. RTN 3-19849
11. RTN 3-22499
12. RTN 3-17387
13. Tetrachloroethylene in Groundwater
14. Former Transformers 1, 2, 3, 4, 5, 6 and 11
15. RTN 3-13744
16. RTN 3-17445
17. RTN 3-22934
18. RTN 3-22863
19. RTN 3-20199

ATTACHMENT 2

Mystic Station

Photographic Log

Photograph Log

Photo 01 – Ammonia storage tanks; oil transfer lines

Photo 02 – Ammonia Storage Tank

Photo 03 – Former surface impoundment area

Photo 04 – Surface stormwater drain

Photo 05 – One of four stormwater catchment basins, discharges pursuant to NPDES

Photo 06 – Air emission stacks

Photograph Log

Photo 07 – 18,000 gallon flyash pond

Photo 08 – No. 6 fuel oil bulk product storage tanks and secondary containment berm

Photo 09 – Dock

Photo 10 – Boom around outfall in river

Photo 11 – Wastewater treatment tank

Photo 12 - Grates

Photograph Log

Photo 13 – Wastewater treatment lines

Photo 14 – Red ultrapure water condensate storage tanks

Photo 15 – Wastewater treatment system control room panel

Photo 16 – Wastewater treatment, sulfuric acid tank

Photo 17 – Wastewater treatment, sodium hydroxide tank

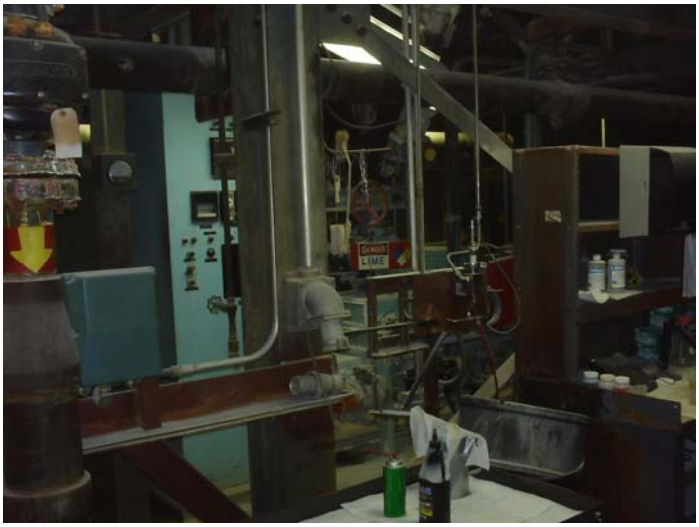

Photo 18 – Wastewater treatment, lime addition area

Photograph Log

Photo 19 – Wastewater treatment, lime tank

Photo 20 – Wastewater treatment, coagulant mixing tank

Photo 21 – Wastewater treatment, floor drain

Photo 22 – Wastewater treatment, floor grate

Photo 23 – Metal hydroxide clarifier tank

Photo 24 – Scrap metal roll-off container

Photo 25 – Domestic waste dumpsters

Photo 26 – Wastewater sludge dewatering building

Photo 27 – Wastewater treatment building

Photo 28 – Oil/water separator (from surge tank)

Photo 29 – Antifoaming agent drums in clarifier building

Photo 30 –Wastewater tanks and 870,000 concrete polishing pond

Photograph Log

Photo 31 – Condensate water tanks; stormwater drain

Photo 32 – Former transformers and sulfuric acid tank

Photo 33 – Groundwater monitoring well

Photo 34 – Water intake line

Photo 35 – Property fence line (toward Alfred Street)

Photo 36 – NSTAR transformers

Photo 37 – Former stormwater sump

Photo 38 – NSTAR transformers

Photo 39 – Sodium hypochlorite AST

Photo 40 –Bulk No. 6 fuel oil storage tank number 4

Photo 41 – Wastewater treatment system sulfuric acid tank

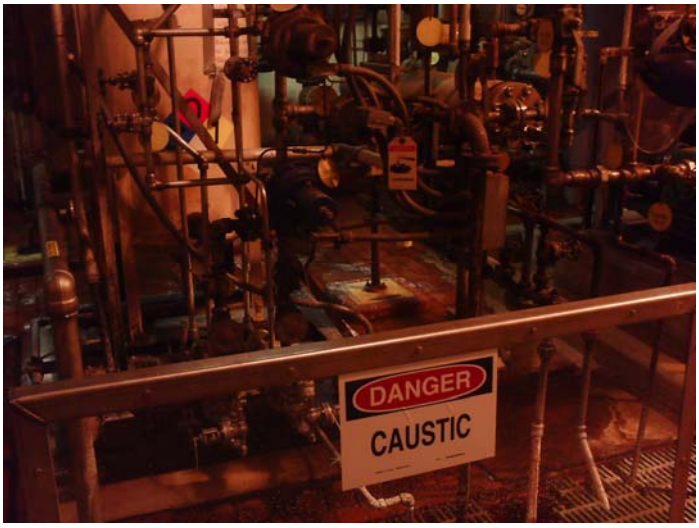

Photo 42 – Wastewater treatment system caustic area

Photo 43 – Condensate polishing tanks

Photo 44 – Sulfuric acid AST

Photo 45 – Caustic contents AST

Photo 46 – Sodium hydroxide AST

Photo 47 – Ammonium hydroxide AST

Photo 48 – Floor drains in water treatment building

Photograph Log

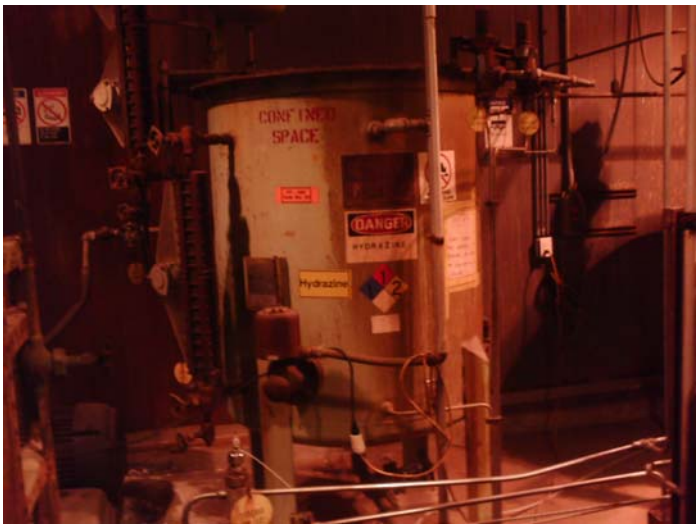

Photo 49 – Hydrazine (virgin) AST

Photo 50 – Waste oil and oily debris temporary accumulation area

Photo 51 - Waste oil and oily debris temporary accumulation area

Photo 52 – Hazardous waste labeling instructions

Photo 53 – Waste oil signage

Photo 54- Universal waste temporary accumulation area (bulbs, batteries, computers)

Photo 55 – Machine shop

Photo 56 – Safety Kleen parts washer

Photo 57 – Virgin petroleum product drums

Photo 58 – Virgin drums of fire-resistant hydraulic fluid

ATTACHMENT 3

Mystic Station

Sanborn Fire Insurance Maps

Mystic Power Station
173 Alford Street
Charlestown, MA 02129

Inquiry Number: 2316696.2S
September 16, 2008

Certified Sanborn® Map Report

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

9/16/08

Site Name:
Mystic Power Station
173 Alford Street
Charlestown, MA 02129

Client Name:
Mabbett & Assoc.
5 Alfred Circle
Bedford, MA 01730

EDR Inquiry # 2316696.2S

Contact: Kiran Sears

EDR® Environmental Data Resources Inc

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Certified Sanborn Results:

Site Name: Mystic Power Station
Address: 173 Alford Street
City, State, Zip: Charlestown, MA 02129
Cross Street:
P.O. # 4369
Project: 7051012.001
Certification # FFB4-4888-966D

Maps Identified - Number of maps indicated within "( )"

1972 (1)
1970 (1)
1955 (1)
1950 (1)

Total Maps: 4

Sanborn® Library search results
Certification # FFB4-4888-966D

The Sanborn Library includes more than 1.2 million Sanborn fire insurance maps, which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

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- ✔ University Publications of America
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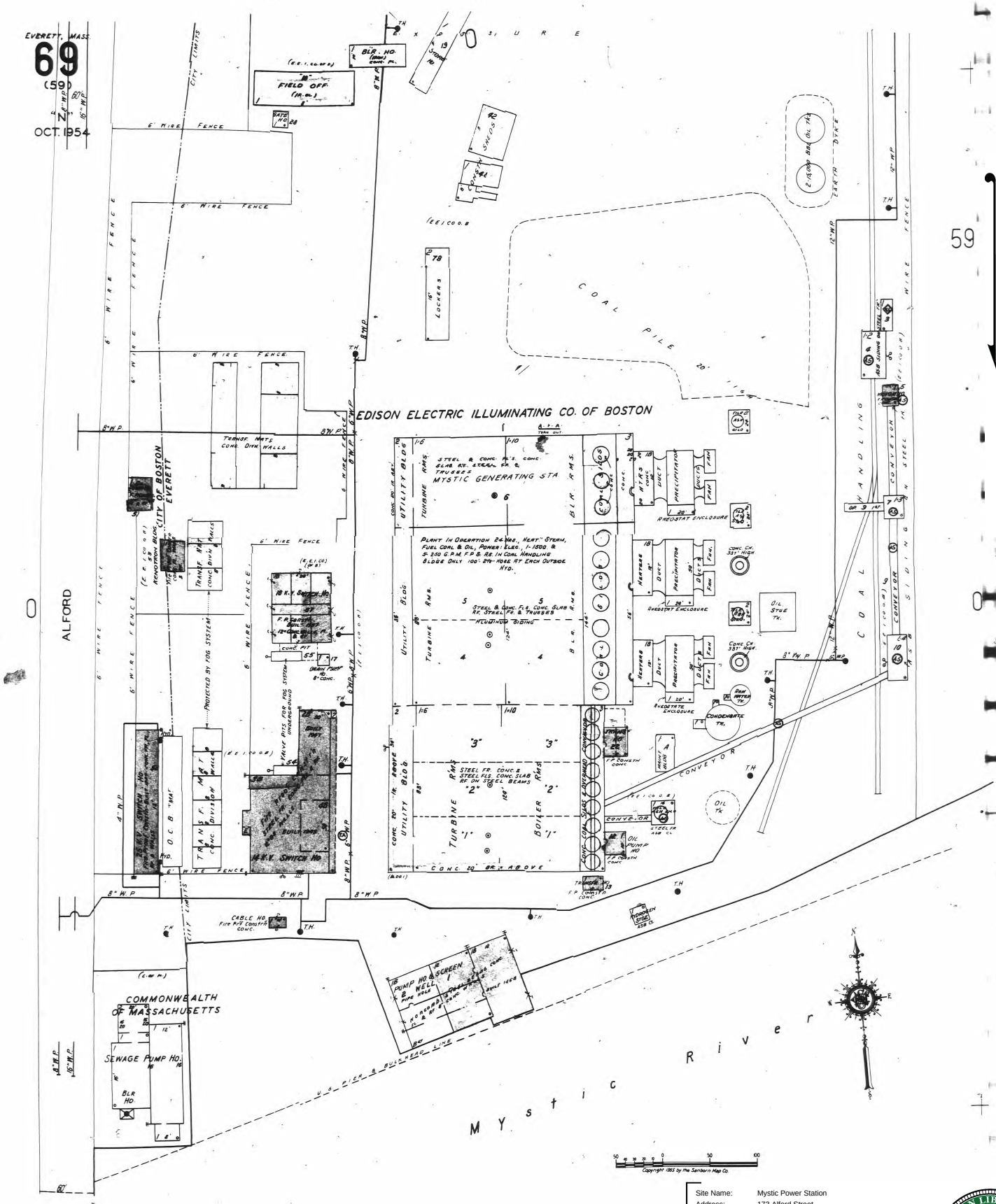

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Address:	173 Alford Street
City, ST, ZIP:	Charlestown MA 02129
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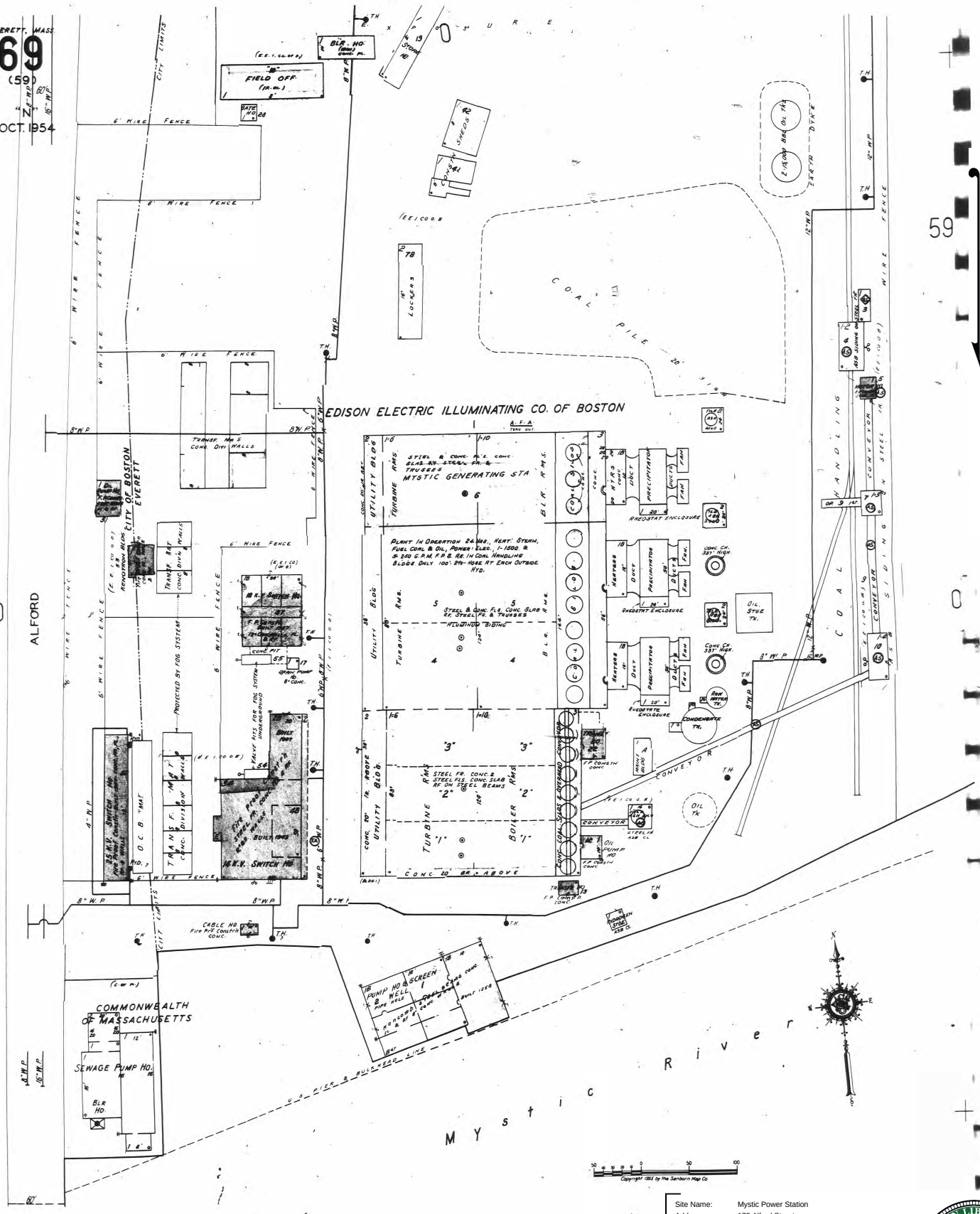

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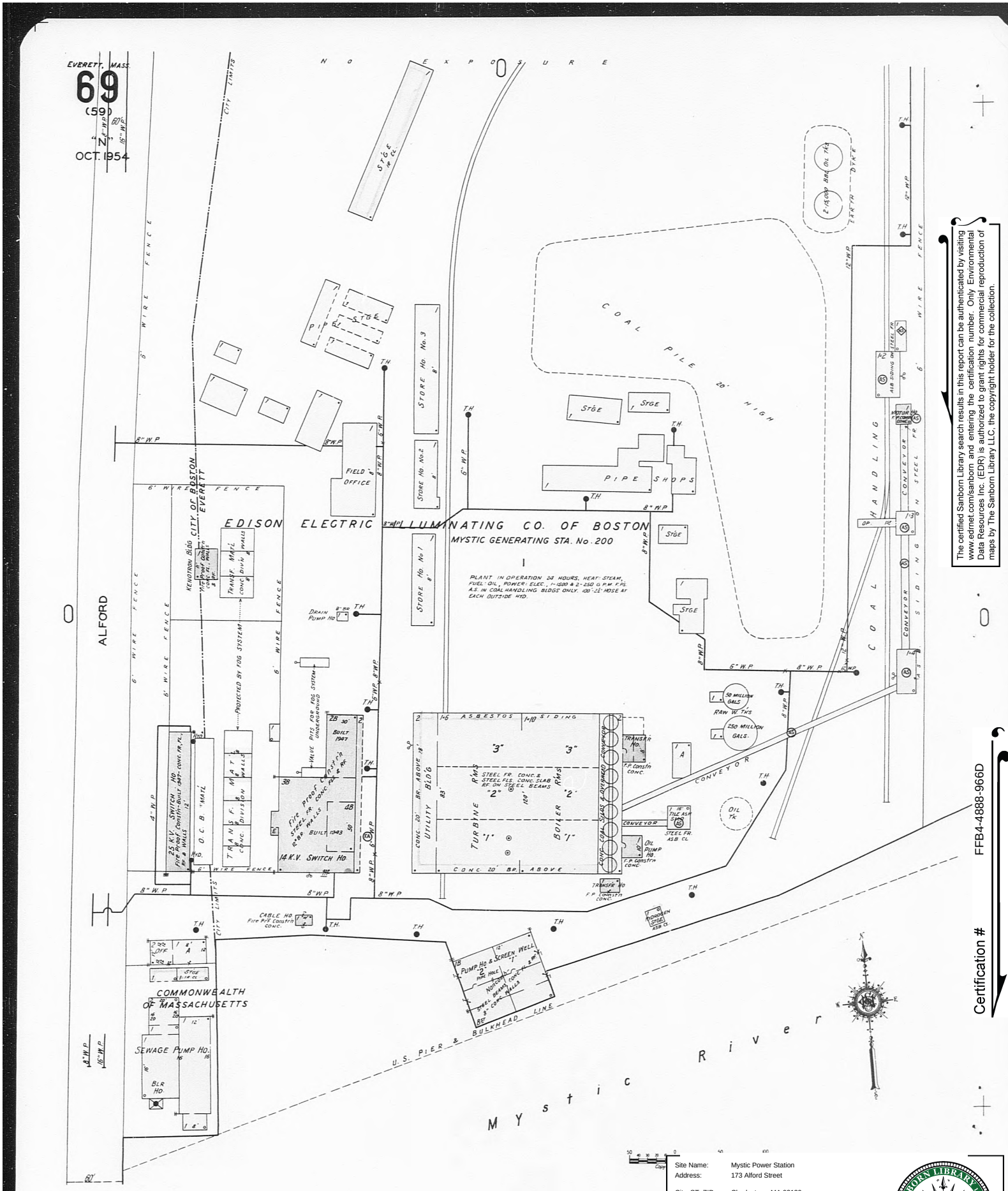

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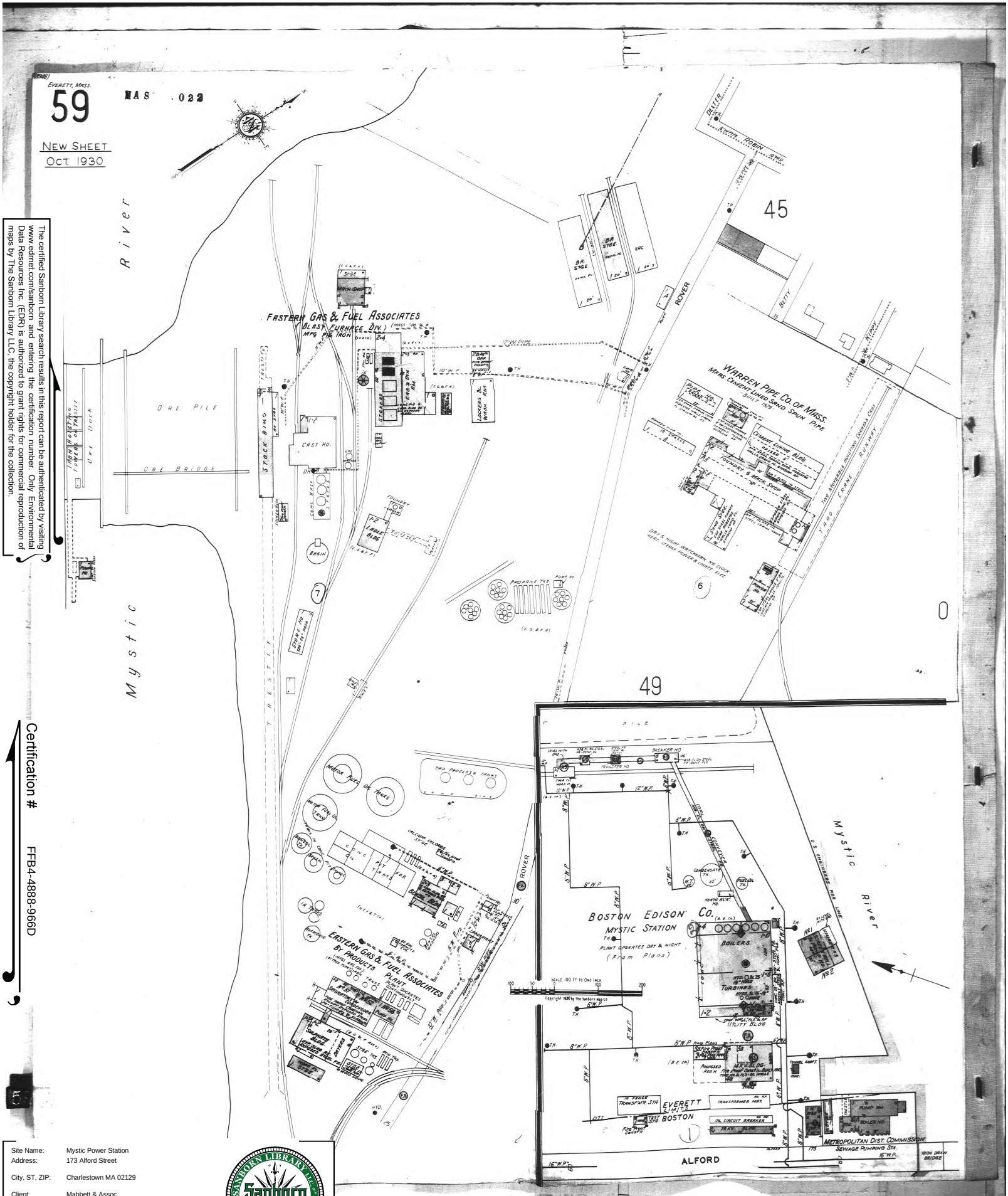

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