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**FINAL SECOND FIVE YEAR REVIEW  
UNITED STATES COAST GUARD  
INDUSTRIAL PRODUCTION DETACHMENT  
SOUTH WEYMOUTH, MASSACHUSETTS**

Superfund Records Center

SITE: SOUTH WEYMOUTH NAS

BREAK: 8.3

OTHER: 595438



**PREPARED BY:  
UNITED STATES COAST GUARD  
CIVIL ENGINEERING UNIT PROVIDENCE  
475 KILVERT STREET, SUITE 100  
WARWICK, RI 02886**

**DECEMBER 2016**

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**CONCURRENCES**

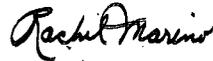
Document Prepared By:



Date: 12/21/2016

Michael Andrews  
U.S. Coast Guard Civil Engineering Unit Providence  
Environmental Engineer

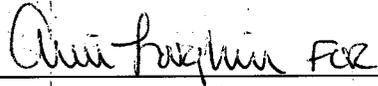
Document Reviewed By:



Date: 12/21/2016

Rachel Marino  
U.S. Coast Guard Civil Engineering Unit Providence  
Chief, Environmental Branch

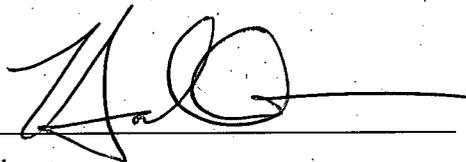
Concur By:



Date: 12/22/16

Matthew Audet  
U.S. Environmental Protection Agency, New England  
Remedial Project Manager

Concur By:



Date: 12/22/16

Bryan Olson  
U.S. Environmental Protection Agency, New England  
Director, Office of Site Remediation and Restoration

## LIST OF ACRONYMS

AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
IPDSW site	U.S. Coast Guard South Weymouth Industrial Production Detachment South Weymouth site
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Constituent of concern
COPC	Constituent of potential concern
CEU	Civil Engineering Unit (Providence)
EA	EA Engineering, Science, and Technology, Inc.
EPA	U.S. Environmental Protection Agency
ft	Feet(foot)
ft <sup>2</sup>	Square feet(foot)
in.	Inch(es)
IPDSW	Industrial Production Detachment South Weymouth
LBP	Lead-based paint
LTMP	Long-Term Monitoring Plan
LUC	Land Use Control
LUCIP	Land Use Control Implementation Plan
MassDEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
O&M	Operation and maintenance
PAL	Project Action Limit
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RG	Remedial Goal
ROD	Record of Decision
USCG	U.S. Coast Guard
UU/UE	Unlimited Use / Unrestricted Exposure

## EXECUTIVE SUMMARY

The U.S. Coast Guard (USCG) has conducted the second Five-Year Review of the remedial action implemented at the USCG Industrial Production Detachment South Weymouth in South Weymouth, Massachusetts (IPDSW site). The purpose of this second Five-Year Review is to determine whether the selected remedy is protective of human health and the environment. This statutory review was conducted from June to December 2016, and its findings and conclusions are documented in this report. The second Five-Year Review period is from December 2011 to December 2016.

The IPDSW site is the USCG's principal facility in the Northeast for storing, cleaning, repairing, and painting navigational buoys. The IPDSW is located on the USCG's property and is approximately 5 acres in size. There is a two-story, steel and concrete block building occupying approximately 20,000 square feet (ft<sup>2</sup>) on the northwestern portion of the property. Asphalt and concrete paved driveways surround the building. Most of the property is a crushed stone covered buoy storage area to the south and east of the building. The property is relatively flat with topographic relief gently sloping toward a wetland area to the southeast. A drainage swale abuts the southern fence line of the site and receives intermittent stormwater runoff from the buoy storage area. The drainage swale runs from west to east and discharges stormwater to a forested wetland.

A Record of Decision (ROD) selecting the remedy was signed on 29 September 2006 (USCG 2006). The components of the selected remedy include implementing land use controls (LUCs) including institutional controls and engineering controls, conducting long-term monitoring of the surface soils in the stormwater drainage swale and wetland area immediately adjacent to the property, and conducting Five-Year Reviews in accordance with Comprehensive Environmental Response, Compensation, and Liability Act Section 121(c). The remedy has been implemented since 2006. A Land Use Control and Implementation Plan (LUCIP) was developed in draft format in 2006 and finalized in 2010. Four rounds of long-term monitoring of the soils in the swale and wetland were conducted between 2011 and 2014 in accordance with the Long-Term Monitoring Plan (LTMP) (EA 2007a) and Quality Assurance Project Plan (QAPP) developed for the site (EA 2007b).

The first Five-Year Review submitted in 2011 presented increasing trends for metals concentrations in the off-site swale and wetland areas. Several recommendations were made in that report to reduce the conveyance of metals during runoff events. Soil sampling data from the swale and wetland presented in the 2012 annual monitoring report indicated that concentrations of metals had increased significantly since the previous year. In 2013, the USCG conducted an additional study of the property to identify engineering corrective actions to reduce off-site migration of metals to the swale and wetland. A report was prepared entitled, "Evaluations of Options for Minimizing Off-Site Transport of Contaminated Sediment" (Watermark 2014). Based on a review of the options identified in the report, the USCG determined that excavation of impacted soils in the buoy storage area and replacement with clean fill would be the most cost effective and sustainable approach to eliminating off-site metals impacts. In 2015, the USCG conducted soil sampling for metals throughout the buoy storage area, swale and wetland in order to prepare plans and specifications for remediation. In 2015, the USCG prepared a CERCLA Roadmap (AMEC 2015) to provide an overview of regulatory activities necessary to conduct remediation of the site. Based on the approved CERCLA Roadmap, the USCG subsequently prepared the following pre-remediation documents:

- Engineering Evaluation/Cost Analysis (EE/CA) (Tantara 2016)
- Action Memorandum (Tantara 2016a)
- Remedial Action Work Plan (RAWP) (Tantara 2016b)
- Sampling and Analysis Plan (SAP) (Tantara 2016c).

While not required in the CERCLA Roadmap, the EPA and MassDEP also required preparation of a Project Specific Quality Assurance Project Plan (QAPP) (Tantara 2016d). In August of 2016 and upon approval of the RAWP and SAP, the USCG commenced remediation of the site. As of the date of this Second Five Year Review, remediation of the entire site including the swale and wetland by removing metals impacted soils is substantially completed to cleanup goals that support unlimited use of the site. The off-site migration of contamination from IPDSW has been eliminated by removing the source of metals from the buoy storage area. In 2017, the USCG plans to prepare a Remedial Action Completion Report (RACR) and Explanation of Significant Differences (ESD) so that EPA may proceed with de-listing the site from CERCLA.

This second Five-Year Review includes the following components: document review, data review, applicable or relevant and appropriate requirements (ARARs) review, site inspection, and interviews. Documents reviewed for this Five-Year Review included, but were not limited to, the following: ROD, LUCIP, LTMP, QAPP, long-term monitoring reports, quarterly and annual operation and maintenance (O&M) reports, Annual LUC Inspection Reports and documentation related to the final remediation of the site. This second Five-Year Review focuses on the data obtained during routine monitoring events, 2015 pre-remediation sampling and O&M activities conducted during the 2011-2016 timeframe.

Available data since compilation of the first five year review suggest the selected remedy from the 2006 ROD was not performing as intended. Therefore, the USCG has implemented corrective actions including the remediation of metals impacted soils at IPDSW and in the off-site swale and wetland to cleanup goals that support unlimited use / unrestricted exposure (UU/UE) under the regulatory oversight of EPA and MassDEP.

Based upon the removal action taken by the USCG in 2016 to remediate the IPDSW site, the USCG has determined that there are no issues, recommendations or follow-up actions necessary.

Five-Year Review Summary Form	
<b>Site Identification</b>	
Site Name (from WasteLAN): USCG South Weymouth IPDSW Site	
EPA ID (from WasteLAN): MA0690330758	
Region: 1	State: Massachusetts City/County: South Weymouth
<b>Site Status</b>	
NPL Status: <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify) _____	
Remediation Status (choose all that apply): <input type="checkbox"/> Under Construction <input checked="" type="checkbox"/> Operating <input type="checkbox"/> Complete	
Multiple Operable Units? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Construction Completion Date: <u>April 2006</u> w/ additional remediation in progress
Has site been put into reuse? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<b>Review Status</b>	
Reviewing Agency: <input type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input checked="" type="checkbox"/> Other Federal Agency <u>USCG</u>	
Author Name: Michael Andrews	
Author Title: Environmental Engineer	Author Affiliation: U.S. Coast Guard
Review Period:* <u>June–December 2016</u>	
Date(s) of Site Inspection: <u>06 July 2016</u>	
Type of Review: <input checked="" type="checkbox"/> Statutory <input type="checkbox"/> Policy <input type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion	
Review Number: <input type="checkbox"/> 1 (first) <input checked="" type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify) _____	
Triggering Action: <input checked="" type="checkbox"/> Actual Remedial Action On-site Construction at Operable Unit <input type="checkbox"/> Actual Remedial Action Start <input checked="" type="checkbox"/> Previous Five-Year Review Report <input type="checkbox"/> Construction Completion <input type="checkbox"/> Other (specify) _____	
Triggering Action Date (from WasteLAN): 22 December 2006	
Due Date (Ten Years After Triggering Action Date): 22 December 2016	
* The review period refers to the period during which the Five-Year Review was conducted.	

## Five-Year Review Summary Form

### **Issues:**

Based upon the removal action taken by the USCG in 2016 to remediate the site, the USCG has determined that there are no issues to report.

### **Recommendations and Follow-up Actions:**

Because no issues were identified in Section 9.0, the USCG has determined that there are no recommendations or follow-up actions necessary.

### **Protectiveness Statement:**

The remedy at OU10 is protective of human health and the environment.

## 1.0 INTRODUCTION

This Second Five-Year Review Report was prepared in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, 42 United States Code § 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 Code of Federal Regulations Part 300 et seq., as amended. The regulatory program performed under the context of these combined laws and regulations is commonly referred to as "Superfund." This Five-Year Review, prepared by the USCG Civil Engineering Unit (CEU) Providence, evaluates the effectiveness of the selected remedy at the USCG South Weymouth IPDSW site (IPDSW site) and explains the rationale for performing additional remedial actions in 2016. The selected remedy for the IPDSW site includes land use controls (LUCs), long-term monitoring, and Five-Year Reviews. The selected remedy was set forth in the Record of Decision (ROD) signed 29 September 2006 (USCG 2006). The first Five-Year Review was submitted in December 2011.

The first Five-Year Review submitted in 2011 presented increasing trends for metals concentrations in the off-site swale and wetland areas. In response, the USCG implemented a recommendation from the Five-Year Review to remove sediment from the Vortechs system and catch basins annually to reduce metals concentrations in off-site stormwater flows. Additionally, in 2013, the USCG conducted a study of the property to identify engineering corrective actions to reduce off-site migration of metals to the swale and wetland. A report was prepared entitled, "Evaluations of Options for Minimizing Off-Site Transport of Contaminated Sediment" (Watermark 2014). Based on a review of the options identified in the report, the USCG determined that excavation of impacted soils in the buoy storage area and replacement with clean fill would be the most cost effective and sustainable approach to eliminating off-site metals impacts. In 2015, the USCG conducted soil sampling for metals throughout the buoy storage area, swale and wetland in order to prepare plans and specifications for remediation. In 2015, the USCG prepared a CERCLA Roadmap (AMEC 2015) to provide an overview of the regulatory activities necessary to conduct remediation of the site. Based on the approved CERCLA Roadmap, and the USCG subsequently prepared the following pre-remediation documents:

- Engineering Evaluation/Cost Analysis (EE/CA) (Tantara 2016)
- Action Memorandum (Tantara 2016a)
- Remedial Action Work Plan (RAWP)(Tantara 2016b)
- Sampling and Analysis Plan (SAP)(Tantara 2016c)

While not required in the CERCLA Roadmap, the EPA and MassDEP also required preparation of a Project Specific Quality Assurance Project Plan (QAPP) (Tantara 2016d). In August of 2016 and upon approval of the RAWP and SAP, the USCG commenced remediation of the site. As of the date of this Second Five Year Review, remediation of the entire site including the swale and wetland is substantially completed. The off-site migration of contamination from IPDSW has been eliminated by removing the source of metals impacts in the buoy storage area. The remedial action also included the excavation of impacted soils in the swale and wetland for unlimited use and unrestricted exposure with follow-up restoration. The cleanup goals in the swale and wetland were selected to eliminate unacceptable risks to the environment. In 2017, the USCG will prepare a Remedial Action Completion Report (RACR), and Explanation of Significant Differences (ESD) so that EPA may proceed with de-listing the site from CERCLA.

The USCG conducted the Five-Year Review from July to December 2016. The purpose of a Five-Year Review is to determine whether the selected remedy at a site remains protective of human health and the environment. This Five-Year Review Report identifies issues found during the USCG's

review, documents results, and makes recommendations to address these in accordance with U.S. Environmental Protection Agency (EPA) guidance.

This is the second Five-Year Review for the IPDSW site. The period addressed by this Five-Year Review extended from December 2011 to December 2016. The triggering action for this review was the final ROD, which was signed 29 September 2006 (USCG 2006). The most recent sampling event has occurred in the form of post-excavation confirmation samples in order to document that soils have been remediated in accordance with the RAWP and SAP. These sampling events occurred within the Five-Year Review period, however, the data were not tabulated for presentation at the time of this report. The confirmation sampling data will be presented in the Remedial Action Closure Report. The results from prior sampling events, from 2011 to 2016, have been reviewed. The second Five-Year Review is required due to the fact that the site has not been delisted from the CERCLA NPL prior to the deadline for the review. It is anticipated that the site will be delisted subsequent to the USCG's completion of the CERCLA Roadmap post-remediation activities. Once EPA delists the site, five year reviews of IPDSW will no longer be required.

## 2.0 SITE CHRONOLOGY

Table 1 presents a chronology of significant events for the IPDSW site.

### 3.0 BACKGROUND

This section discusses the physical characteristics of the IPDSW site, including land and resource use and environmental setting. Additionally, the history of site contamination, initial response action taken at the site, and basis for the response action are described. Remedial actions conducted following the initial response action at the site are discussed in Section 4.

#### 3.1 Physical Characteristics

The site is located at 65 Trotter Road in South Weymouth, Massachusetts (Figures 1 and 2). The national Superfund electronic database identification number for the site is MA0690330758. The IPDSW property was formerly part of the Naval Air Station South Weymouth, and the site is part of the Naval Air Station South Weymouth National Priorities List site.

#### 3.2 Land and Resource Use

The IPDSW site is comprised of the USCG IPDSW property in South Weymouth as well as the stormwater drainage swale and the affected portion of the downstream wetland located to the south on adjacent property controlled by the Navy and LSTAR Management, LLC, also in South Weymouth. The USCG Base Boston operates the facility. USCG is the lead agency, with EPA as the support agency, for site investigation and restoration under CERCLA. USCG is the sole source of funding for the investigation and response actions at the site.

USCG leased the IPDSW property from the Navy beginning on 1 March 1972. In October 2000, the USCG IPDSW property was transferred to USCG from the Navy through a Federal Agency to Federal Agency Transfer. Upon transfer of the property from the Navy, USCG also assumed responsibility for the CERCLA investigation and response actions at the IPDSW site through a Federal Facility Agreement with EPA.

The IPDSW is the USCG's principal facility in the Northeast for storing, cleaning, repairing, and painting navigational buoys. The IPDSW is located on the USCG's property (IPDSW property) and is approximately 5 acres in size. The adjacent land is mostly forested to the north and south. There are wetlands to the south and southeast, an open field to the east, and a commuter rail line and commercial businesses to the west (Figure 2). A chain-link fence with lockable gates surrounds the IPDSW property. There is a two-story, steel and concrete block building occupying approximately 20,000 square feet (ft<sup>2</sup>) on the northwestern portion of the property. Asphalt and concrete paved driveways surround the building. Most of the property is a dirt and gravel-covered buoy storage area to the south and east of the building. The property is relatively flat with topographic relief gently sloping toward a wetland area to the southeast. A drainage swale (a low-lying area or ditch) abuts the southern fence line of the IPDSW property and received intermittent stormwater runoff from the buoy storage area. The drainage swale runs from west to east and discharges stormwater to the forested wetland. The swale and a portion of the wetland on Navy and LSTAR Management, LLC property had been impacted by the IPDSW facility operations and are, therefore, part of the IPDSW site.

#### 3.3 History of Contamination

Since facility construction was completed (1972-1973), IPDSW operations have included buoy rehabilitation (e.g., "shot blasting" to remove old paint, welding, painting, and electrical wiring), minor vehicle and equipment maintenance, waste generation (steel shot blast residue, waste oils, paint-related waste) and fuel storage, warehousing, outdoor scrap metal storage, and administrative use. Most of the buoys are constructed of steel and range in size from 3 feet (ft) to greater than 30 ft in length and can weigh up to 20,000 pounds. Old or damaged buoys that are beyond repair are stored at the IPDSW pending sale as scrap metal.

As a result of facility operations (i.e., buoy storage, refurbishment, and scrapping), lead and paint chips were present in the surface soil of the buoy storage area. Due to stormwater runoff, surface soil of an adjacent drainage swale and wetland were impacted with metals, primarily lead, from the buoy storage area. The USCG stopped buying lead-based paint (LBP) and primers for buoys in 1986. The USCG was required to deplete this existing paint inventory by 1988. Buoys are refurbished every 6-8 years. Therefore, all of the USCG's buoys that are now received at the IPDSW have already been cycled through the system and repainted with non-LBP.

### 3.4 Initial Response

The site has been the subject of a Remedial Investigation (EA 2001) and Feasibility Study, an Engineering Evaluation/Cost Analysis (EA 2002), and both Time-Critical and Non-Time-Critical Removal Actions (EA 2003) to address lead in soil associated with facility use of lead-based primers through the mid-1980s.

USCG excavated lead-contaminated soil around a former dust collection system, removed and decommissioned the building's floor drain system, and excavated soil posing unacceptable human health and ecological risks in the stormwater drainage swale and wetland area on abutting Navy property. Accordingly, no risk concerns remained for ecological receptors in the swale or wetland. The USCG also reduced the potential for recontamination of the swale and wetland through the construction of a stormwater control system, which reduced the transport of soil particles and paint chips from the buoy storage area to the drainage swale. The swale and wetland portions of the site have been remediated for unlimited use and unrestricted exposure. In addition, cleanup goals for the swale and wetland were selected to eliminate unacceptable risks to the environment.

The current and planned future use of the USCG property is industrial and, based on the results of the Human Health Risk Assessment, the environmental conditions of the IPDSW property are suitable (i.e., do not exceed CERCLA risk benchmarks) for continued industrial operations. During preparation of the ROD, EPA and USCG agreed that the buoy storage area may not be suitable for unlimited use and unrestricted exposure due to the remaining lead concentrations and paint chips (potentially lead-based) present in surface soil. However in 2016, the USCG performed a complete remediation of the buoy storage area to cleanup goals that support unlimited use and unrestricted exposure. Presently, the average lead concentration in the buoy storage area is less than 200 mg/kg (the Massachusetts Contingency Plan S-1 Soil Standard for lead). The rationale for remediating the site to cleanup goals that support unlimited use and unrestricted exposure was not to facilitate future residential development of the property, but rather to prevent contaminants at industrial/commercial levels from impacting off-site properties via stormwater runoff. The USCG has no plans to change the use of the property from the current industrial operations.

### 3.5 Basis for Taking Action

Prior to the 2016 remedial action, some remaining risk concerns were identified for hypothetical, future, and non-commercial/industrial reuse scenarios associated with the residual lead and paint chips in the surface soil of the buoy storage yard. The presence of lead and paint chips in surface soil, if not addressed by implementing the LUCs, long-term monitoring, and Five-Year Reviews specified in the ROD (USCG 2006), could have presented an endangerment to public health, welfare, or the environment.

The selected remedy from the ROD addressed these concerns by preventing land use that could result in unacceptable exposure to lead or paint chips in soil by sensitive receptors (i.e., certain non-commercial/industrial uses as specified in Section 2.12.2.2.1 of the ROD [USCG 2006]), and by

preventing migration of soil from the buoy storage area to adjacent property. In addition, that remedy included long-term monitoring of the swale and wetland to monitor the effectiveness for preventing recontamination of the adjacent stormwater drainage swale and downstream wetland areas.

In 2013, the USCG observed that concentrations of metals in the off-site swale and wetland were increasing despite efforts to implement recommendations from the first Five-Year Review. As such, the USCG conducted an Evaluation of Options for Minimizing Off-Site Transport of Contaminated Sediment from the Storm Water Management System (Watermark 2014). Based on a review of the options identified in that report, the USCG determined that excavation of impacted soils in the buoy storage area and replacement with clean fill would be the most cost effective and sustainable approach to eliminating off-site metals impacts. The USCG's objective to eliminate off-site contamination of metals via the IPDSW stormwater ultimately became the basis for taking the remedial action executed in 2016.

## 4.0 REMEDIAL ACTIONS

Sections 4.1 through 4.5 discuss the remedy objectives, selection, and implementation of the selected remedy for the buoy storage area (i.e., buoy, equipment, and scrap metal storage area) as required by the ROD. It also describes the ongoing operation and maintenance (O&M) activities and progress since completion of the initial remedial action. Section 4.6 describes the site remediation activities that were executed in 2016 during the second Five-Year Review period.

### 4.1 Remedy Objectives

Based on preliminary information relating to types of environmental media of concern and potential exposure pathways, response action objectives, both removal action and remedial action objectives, were developed to aid in the development and screening of alternatives. These response action objectives were developed to mitigate, restore, and/or prevent existing and future potential threats to human health and the environment. The following goals were developed during the Engineering Evaluation/Cost Analysis (EA 2002) for the Non-Time-Critical Removal Action (EA 2003) completed in 2003:

- Prevention, to the extent practicable, of direct contact with and ingestion of surficial soil that presents unacceptable risks to human health and/or ecological receptors (i.e., the soil of the swale and wetlands)
- Prevention of potential future impacts to groundwater beneath the site through removal of impacted soil and sludge associated with existing floor drains beneath the site building
- Mitigation of ongoing migration of metals (primarily lead) from the buoy storage area to the adjacent drainage swale and the downstream wetland, and prevention of future migration to the extent possible.

The initial Non-Time-Critical Removal Action (EA 2003) achieved the above goals through excavation of the swale soil and wetland hydric soil, removal of the building's floor drain system, and installation of the stormwater management system. Subsequent to the Non-Time-Critical Removal Action, USCG issued a Feasibility Study to address the remaining portion of the AOC that was not yet addressed through the completed removal actions (i.e., the buoy storage area also known as AOC 3 in the ROD). The Feasibility Study presented the following response action objectives for the buoy storage area:

- Prevent future human (residential) exposure to lead and potential LBP chips in soil of the buoy storage area
- Prevent constituents of concern (COCs) in on-site soil from migrating off the IPDSW property.

Achieving the combination of all these goals provides for a complete site remedy, which is protective of human health and the environment and which complies with Applicable or Relevant and Appropriate Requirements (ARARs). The completed removal actions mitigated the unacceptable human health (cancer and non-cancer) and ecological risks associated primarily with lead in soil at the site. The selected remedy effectively mitigates the remaining risk concerns associated with various hypothetical future use scenarios to lead and/or paint chips in surface soil of the buoy storage area. At present, the USCG has no plans to transfer the IPDSW property and the current industrial operations will continue into the future. The initial removal actions restored the swale/wetland areas so that potential risks to human health or the environment did not exceed EPA's threshold risk levels for any of the evaluated use scenarios. The swale and wetland areas were also completely remediated to cleanup goals that support unlimited use and unrestricted exposure in 2016 as described in Section 4.6

of this report. In addition, the swale and wetland cleanup goals were selected to eliminate unacceptable risks to environmental receptors. Furthermore, the risk assessments demonstrated that the IPDSW property portion of the site is suitable for continued industrial use because risk levels do not exceed EPA's threshold risk levels for a commercial/industrial use scenario. The recent removal action completed in 2016 has remediated the buoy storage area to cleanup goals that support unlimited use and unrestricted exposure, however, the site will continue to be used for industrial purposes. The selected remedy mitigates the remaining risk concerns via LUCs that include institutional controls to ensure proper (acceptable) use of the property in the future, and engineering controls to maintain preventative measures for the migration of lead and paint chips in buoy storage area soil to offsite areas via stormwater runoff. No response action objectives were required for groundwater because the identified risks in groundwater were associated with constituent of potential concern (COPC) concentrations that were consistent with background levels. Following the future delisting of the site in 2017, the USCG anticipates that LUCs will no longer be required given the site has been remediated to cleanup goals that support unlimited use and unrestricted exposure.

#### 4.2 Selected Remedy (2006 ROD)

A ROD for the site was signed by EPA and USCG on 29 September 2006 (USCG 2006). The MassDEP concurred with the ROD. The Selected Remedy included No Further Action for AOC 1 (i.e., building and adjacent areas to the south); No Action for AOC 2 (i.e., septic system tank, piping, and leach field); and LUCs (institutional and engineering controls), long-term monitoring, and Five-Year Reviews for AOC 3 (i.e., buoy, equipment, and scrap metal storage area). The selected remedy, combined with the completed removal actions, comprised a comprehensive remedy.

The selected remedy addressed the remaining risk concerns associated with lead and LBP chips in surface soil under certain reuse scenarios. Specifically, the ROD (USCG 2006) specified LUCs that include establishment of institutional controls to prohibit current and future uses that could result in unacceptable risks to certain potentially sensitive receptors, and engineering controls to manage potential migration of soil from the buoy storage area to the drainage swale and wetland on adjacent Navy property. The ROD also specified long-term monitoring and Five-Year Reviews to ensure the long-term effectiveness of the remedy. The LUCs apply to the USCG IPDSW property portion of the site. It is anticipated that the LUCs will no longer be required once the site is delisted from the CERCLA NPL in 2017.

#### 4.3 Remedy Implementation

USCG established LUCs that apply to the USCG IPDSW property. The LUCs consist of institutional and engineering controls. The USCG developed a LUCIP (EA 2010b) for implementing the LUCs.

#### *4.3.1 Institutional Controls*

USCG implemented institutional controls in the form of a USCG Instruction delineating the property use restrictions while the property is controlled by the USCG and deed restrictions in the event of any transfer of the IPDSW property. These controls prohibit future uses of the IPDSW property for which concentrations of lead and the presence of paint chips in soil may be unacceptable. Prohibited uses of the IPDSW site include residential use; certain recreational uses; agricultural use; use involving facilities with children under the age of 6, such as daycare centers or playgrounds; or use as wildlife habitat without further evaluation. The institutional controls remain in effect unless and until mitigation measures are taken to reduce lead concentrations in soil to levels that allow for unlimited use and unrestricted exposure on the property. The institutional controls are implemented in accordance with the LUCIP. It is anticipated that institutional control at the property will no longer be in effect once the site is delisted from the CERCLA NPL in 2017.

#### *4.3.2 Engineering Controls*

USCG implemented engineering controls on the IPDSW property to prevent unauthorized access to the site and to manage potential migration of soil from the buoy storage area to the drainage swale and wetland on adjacent Navy and LSTAR Management, LLC controlled property. These engineering controls include continuing O&M of the stormwater control system, facility fencing and gates, soil management procedures for operations or construction activities that could disturb soil in the buoy storage area, and procedures for managing the future refurbishment of those limited number of buoys with residual LBP coating. The buoy and soil management procedures are outlined in the LUCIP. The LUCIP includes a USCG Instruction mandating these engineering controls. The engineering controls remain in effect unless and until mitigation measures are taken to reduce concentrations of lead in soil to levels that allow for unlimited use and unrestricted exposure on the property. If the property is transferred in the future to another entity by deed, then the USCG would continue to implement the engineering controls (via deed restrictions) unless and until mitigation measures were taken to reduce concentrations of lead in the soil to levels that allow for unlimited use and unrestricted exposure on the property. It is anticipated that engineering controls at the property will no longer be required once the site is delisted from the CERCLA NPL in 2017.

#### *4.3.3 Long-Term Monitoring*

USCG has conducted annual long-term monitoring of the surface soil in the stormwater drainage swale and downstream wetland area located on adjacent property controlled by the Navy and LSTAR Management, LLC. The swale and wetland are sampled annually until the Five-Year Review (the subject of this report), at which time the data are reviewed, and analysis performed to determine future monitoring requirements. The long-term monitoring samples consist of six soil samples collected in the swale and six soil samples collected in the wetland (Figure 3). The ROD (USCG 2006) required that surface water samples be collected once prior to each Five-Year Review. To satisfy this requirement, the USCG collected surface water samples in 2014 and the data are presented in the report for monitoring event ME-09. All other monitoring events represented in the second Five-Year Review (ME-07, ME-08 and ME-09) involved the collection of soil samples only from the swale and wetland. Three (3) monitoring events and one (1) remediation design sampling event have been completed during the second Five-Year Review period. The last long term monitoring event of the five year period was not completed because the site was actively being remediated.

The first monitoring event (ME-07) occurred in 2012. The results of the ME-07 sampling event identified concentrations of chromium and copper in the swale that exceeded the Remedial Goal (RG) by two times. The ME-07 report proposed the collection of four additional surface soil samples to be

collected in the swale during the next long term monitoring sampling event (ME-08). The purpose of the additional sample locations was to further characterize metals impacts in the drainage swale. In addition, and based on the conclusions of the ME-07 report, the USCG proposed to conduct an evaluation of engineering options to reduce the off-site migration of metals in the stormwater from IPDSW. A report was prepared entitled, Evaluations of Options for Minimizing Off-Site Transport of Contaminated Sediment (Watermark 2014). Based on a review of the options identified in the report, the USCG determined that excavation of impacted soils in the buoy storage area and replacement with clean fill would be the most cost effective and sustainable approach to eliminating off-site metals impacts. The results of the ME-07 report and the Evaluation of Options report were the documents that ultimately led the USCG to conclude that full remediation of the site would be necessary to cease the off-site migration of metals from IPDSW. A summary of the analytical results from the ME-07 monitoring event is provided in Appendix C.

The second monitoring event (ME-08) occurred in 2013. The sampling event included the collection and analysis of 19 surface soil samples (11 from the swale area, 6 from the wetland and 2 duplicates). The sampling included the 5 additional swale samples that were proposed after the analysis of the ME-07 monitoring results. The results for the swale indicated that average concentrations of chromium, copper and lead were less than the results from ME-07 but remained significantly more elevated than prior long term monitoring event results. The sampling results for the swale indicated that with a few exceptions, concentrations of chromium and lead were less than ME-07 monitoring results and were in the range of previous monitoring events. Shortly after the release of the ME-08 report, the USCG submitted the Evaluation of Options report to EPA and MassDEP. The Evaluations of Options report identified full remediation of the buoy storage area, swale and wetland as the preferred alternative to cease the off-site migration of metals from IPDSW. A summary of the analytical results from the ME-08 monitoring event is provided in Appendix D.

The third monitoring event (ME-09) occurred in 2014. The sampling event included the collection and analysis of 14 surface soil samples (six from the swale area, six from the wetland and two duplicates). The USCG did not include the collection of the five additional samples proposed after ME-07 because planning for the site remediation was underway. The additional sample results would not add any value to the data set given that all impacted soil in the swale and wetland would be remediated as part of the project. The results for the swale indicated that average concentrations of chromium, copper and lead were elevated similar to the results of ME-07 and ME-08. The average results of the wetland samples were less than respective values from both the ME-07 and ME-08 monitoring events. USCG also collected four surface water samples during ME-09 per the requirements of the ROD. One sample was collected at the headwall where the Vortech system discharges to the swale and the other 3 samples were collected from standing water in the wetland. The results indicated that metals concentrations decreased with distance from the headwall. Total chromium exceeded the RG at the headwall samples however all other locations were below the RG. Total and dissolved copper, lead and zinc concentrations exceeded their respective RGs at all locations. A summary of the analytical results from the ME-09 monitoring event is provided in Appendix E.

The fourth monitoring event was conducted in the form of a pre-design soil sampling event in the buoy storage area, swale and wetland in 2015. The EPA allowed the substitution of the Final Field Sampling Report, Pre-Design Characterization of Lead Impacted Soil (Watermark 2015) in place of the ME-10 monitoring report. The sampling event in the buoy storage area consisted of the establishment of a 100 foot by 100 foot sampling grid. Twenty-one samples were collected at the grid nodes at depths of 0-6 inches, 6-12 inches and 12-24 inches below ground surface. In total, 63 samples were analyzed by field x-ray fluorescence analyzer. In the swale, 21 sampling locations were

established including 7 swale bottom samples spaced at 50 foot intervals. The remainder of the sample locations was on either sidewall approximately midway up the slope. A sample was collected at each location from 0-6 inches and 6-12 inches below ground surface. A total of 43 samples were analyzed by XRF. In the wetland, samples were collected from 10 locations at 0-6 inches and 6-12 inches below ground surface. A total of 20 wetland soil samples were collected for XRF analysis. In total, the sampling event consisted of 125 soil samples collected for XRF analysis with 20% of the samples (26 total samples) submitted to the laboratory analysis for data confirmation. The correlation was found to be acceptable with a coefficient of correlation ( $R^2$ ) value of 0.82. An  $R^2$  greater than 0.80 is generally considered good. All sample locations were logged by GPS for incorporation into the site excavation plan. A summary of the analytical results from the pre-design soil sampling event is provided in Appendix F.

The results of the 2015 pre-design sampling event at IPDSW were used to develop an excavation plan for the remediation work. In the buoy storage area, 17 of the samples had lead concentrations that exceeded the cleanup objective of 200 mg/kg. The highest concentration detected was 765 mg/kg. Most of the samples were found to exceed the cleanup objective for chromium (16 mg/kg). One sample was found to exceed the remedial objective for copper (1,020 mg/kg). The results confirmed that metals impacts in the buoy storage area were present in each of the three depth intervals sampled. In the swale and wetland, lead, chromium and copper were also found to exceed the respective cleanup objectives.

The USCG did not conduct long term monitoring soil sampling in 2016 because the remediation project was underway. Post-excavation soil samples were collected to confirm that remediation efforts achieved the cleanup objectives. The results of the post-excavation soil confirmation samples will be presented in the Remedial Action Closure Report for the project in 2017.

#### *4.3.4 Five-Year Reviews*

USCG will conduct Five-Year Reviews in accordance with CERCLA and the ROD (USCG 2006) for as long as the site conditions are not suitable for unlimited use and unrestricted exposure (i.e., unless and until mitigation measures are taken to reduce concentrations of lead in soil to levels that allow for unlimited use and unrestricted exposure on the site). The results of the long-term monitoring sampling form the foundation of the Five-Year Review. Analysis of the data is performed to identify any potential trends in the data. In addition, the Five-Year Review assesses compliance with the engineering controls established for the IPDSW, including maintenance of the stormwater control system, soil management, and lead-contaminated buoy management. After the Five-Year Review, and in consult with EPA and MassDEP, the monitoring may continue as planned, or the frequency and/or location of the samples may be changed.

Each Five-Year Review will involve inspection of the site use and abutting (Navy-owned) property to determine property use, reviews of LUC compliance reports, and analyses of the results from the long-term monitoring program conducted in the swale and wetland. The USCG documents the results of the Five-Year Review in a report to be submitted to EPA for approval and to MassDEP for comments. This document represents the second Five-Year Review for the USCG IPDSW property. It is anticipated that this will be the final Five-Year Review for the site. In 2016, the property was remediated to cleanup goals that support unlimited use and unrestricted exposure. USCG anticipates that the property will be delisted from the CERCLA NPL in 2017 following the completion of all CERCLA Roadmap action items.

#### 4.4 Operation and Maintenance

The engineering controls implemented as part of the LUC include ongoing O&M of the stormwater control system, and performing annual LUC inspections. The O&M activities of the stormwater conveyance system have occurred since September 2006. These long-term O&M tasks are required to preserve the effectiveness of the remedy. The O&M tasks include:

- Quarterly inspection of the accumulated solids in the Vortechs stormwater treatment system; polydrain; catch basin CB-1; and deep sump catch basins CB-2, CB-3, and CB-4
- Cleanout (as necessary) of the Vortechs stormwater treatment system; polydrain, catch basin CB-1; and deep sump catch basins CB-2, CB-3, and CB-4 with a vacuum truck
- Repairing (as necessary) the gravel cover in areas where settlement and erosion occurred
- Bi-annual inspection of the detention gallery or when the effectiveness of the detention gallery is determined to be questionable
- Repairing (as necessary) the earthen berm along the perimeter fence, if erosion or settlement occurs
- Removing silt and sediment from the infiltration trench (as necessary).

The annual costs of O&M from 2012 through December 2016 are provided in the table below:

Annual System Operations/O&M Costs			
Year	Action	Action Type	Cost (\$)
2012	Quarterly inspections, Long-term monitoring	Routine inspection, monitoring and analysis	\$22,053
2012	Cleanout Stormwater System	Maintenance and repair	\$14,972
<b>2012</b>	<b>TOTAL</b>		<b>\$37,025</b>
2013	Quarterly inspections, Long-term monitoring	Routine inspection, monitoring and analysis	\$22,935
2013	Cleanout Stormwater System	Maintenance and repair	\$15,571
<b>2013</b>	<b>TOTAL</b>		<b>\$38,506</b>
2014	Quarterly inspections, Long-term monitoring with surface water sampling	Routine inspection, monitoring and analysis	\$28,731
<b>2014</b>	<b>TOTAL</b>		<b>\$28,731</b>
2015	Quarterly inspections	Routine inspection	\$6,870
2015	Remedial design soil sampling (substituted for long term monitoring)	Monitoring and analysis	\$30,589
<b>2015</b>	<b>TOTAL</b>		<b>\$37,459</b>
2016	Quarterly inspections	Routine inspection	\$7,145
2016	<b>TOTAL (not including site remediation costs)</b>		<b>\$7,145</b>
<b>5-YEAR TOTAL (not including site remediation)</b>			<b>\$148,866</b>

The costs include, but are not limited to, O&M activities and consulting and reporting activities. In 2015, the USCG submitted a report entitled, Final Field Sampling Report, Pre-Design Characterization

of Lead Impacted Soil (Watermark 2015). This data presented in this report was accepted by EPA as a substitute for the annual long term monitoring report in 2015. In 2016, the annual long term monitoring work was not conducted because the remediation project was underway. The 5 year total cost does not include any costs related to the remediation of the site in 2016. The total cost of the period covered by the first Five-Year Review was \$125,298. The cost of implementing the remedy increased by approximately 12% between the first and second five year review periods.

#### 4.5 Progress Since Completion of Remedial Action

Since the ROD was signed on 29 September 2006 (USCG 2006), the following actions have occurred:

- Preparation of a LTMP and QAPP (EA 2007a and EA 2007b, respectively)
- Preparation of a LUCIP (EA 2010b)
- Preparation of an O&M Plan for the stormwater control system (EA2010c)
- Monitoring Event 1, June 2007 (EA 2007c)
- Monitoring Event 2, September 2007 (EA 2008a)
- Monitoring Event 3, June 2008 (EA 2008b)
- Monitoring Event 4, June 2009 (EA 2009)
- Monitoring Event 5, June 2010 (EA 2010a)
- Monitoring Event 6, June 2011 (Watermark 2011)
- First Five-Year Review (Watermark 2012a).
- Monitoring Event 7, June 2012 (Watermark 2012b)
- Monitoring Event 8, June 2013 (Watermark 2013)
- Preparation of Evaluations of Options for Minimizing Off-Site Transport of Contaminated Sediment (Watermark 2014a).
- Monitoring Event 9, June 2014 (Watermark 2014b)
- Preparation of CERCLA Roadmap (AMEC 2015)
- Preparation of Final Field Sampling Report, Pre-Design Characterization of Lead Impacted Soil (Watermark 2015)
- Preparation of Engineering Evaluation/Cost Analysis (Tantara 2016)
- Preparation of Action Memorandum (Tantara 2016a),
- Preparation of Remedial Action Work Plan (Tantara 2016b)
- Preparation of Sampling and Analysis Plan (SAP)(Tantara 2016c)
- Preparation of Project Specific Quality Assurance Project Plan (Tantara 2016d)
- Site Remediation Project Substantially Completed as of December 2016
- Second Five Year Review, December 2016

These actions have been implemented as the remedy for the site to fulfill the requirements of incorporating institutional controls, engineering controls, long-term monitoring, and Five-Year Reviews as required by the ROD (USCG 2006). In addition, remediation of the site was performed by the USCG in 2016 to remove impacted soils and cease off-site migration of metals in the stormwater. The details of the remediation project have been described in the Remedial Action Work Plan (Tantara 2016b) and Sampling and Analysis Plan (Tantara 2016c) and summarized in Section 4.6, below. Once

remedial action is completed, the USCG will submit a Remedial Action Closure Report to document the work. It is anticipated that EPA will delist the site in 2017 following completion of the CERCLA Roadmap action items.

#### 4.6 2016 Remedial Actions

In 2014, the USCG conducted an engineering study of the property to identify corrective actions to reduce off-site migration of metals to the swale and wetland. A report was prepared entitled, "Evaluations of Options for Minimizing Off-Site Transport of Contaminated Sediment" (Watermark 2014). Based on a review of the options identified in the report, the USCG determined that excavation of impacted soils in the buoy storage area and replacement with clean fill would be the most cost effective and sustainable approach to eliminating off-site metals impacts. In 2015, the USCG conducted soil sampling for metals throughout the buoy storage area, swale and wetland in order to prepare plans and specifications for remediation. In 2015, the USCG prepared a CERCLA Roadmap (AMEC 2015) to provide an overview of regulatory activities necessary to conduct remediation of the site. Based on the approved CERCLA Roadmap, the USCG subsequently prepared the following pre-remediation documents:

- Engineering Evaluation/Cost Analysis (EE/CA) (Tantara 2016)
- Action Memorandum (Tantara 2016a)
- Remedial Action Work Plan (RAWP) (Tantara 2016b)
- Sampling and Analysis Plan (SAP) (Tantara 2016c).

While not required in the CERCLA Roadmap, the EPA and MassDEP also required preparation of a Project Specific Quality Assurance Project Plan (QAPP) (Tantara 2016d).

The scope of the removal action is to reduce metals contamination, specifically lead, from the buoy storage area and the drainage swale soils to below cleanup objectives in order to eliminate the future transfer of these contaminants to the adjacent wetland. The removal action also includes the excavation of metals impacted sediments that have been deposited in the wetland area. The project will remove restrictions on the future use of the property and eliminate the need for regulated O&M of the stormwater management system.

The main components of the removal action are listed below:

- Temporarily relocate buoys and other equipment.
- Establish soil erosion and sediment control measures.
- Remove the surface 6-24 inches of soil in the buoy storage area, swale and wetland as shown on RAWP drawings.
- Transport and dispose of approximately 3,300 cubic yards of impacted soil at a licensed facility.
- Collect post-excavation confirmatory samples for metals analysis to confirm that remedial objectives have been met and excavate additional soil if necessary based upon confirmation sample results.
- Restore the buoy storage area with clean crushed stone to pre-existing elevations.
- Install an outlet protection apron at the headwall of the swale and restore the swale with a rip-rap gradation to pre-existing elevations.

- Restore the wetland area with loam (high organic matter content) to pre-existing elevations and seed with a New England wetland mix.

The permanent removal of soil exceeding the cleanup objectives further protects the public health and the surrounding environment, because the potential for contaminant migration offsite will be eliminated. The cleanup objectives for the remediation project are:

Analyte	Cleanup Objective (mg/kg)
Arsenic	20
Chromium	16
Copper	1,020
Lead	200
Nickel	230
Zinc	738

This removal action is considered a final removal action and, as such, would eliminate the requirements for annual monitoring, Five-Year Reviews, and regulated O&M of the stormwater management system.

In August of 2016 and upon approval of the RAWP and SAP, the USCG commenced remediation of the site. As of the date of this second five year review, the remediation of the buoy storage area, swale and wetland is substantially completed. In addition, the remedial action includes the removal of impacted soils in seven of nine relatively small unpaved areas that surround the IPDSW building. The USCG anticipates that the final excavation and restoration work will be completed in December 2016. Details of the remedial action will be documented in a Remedial Action Completion Report to be submitted to EPA and MassDEP. The excavation and off-site disposal of impacted soils is significantly different than the remedy approved in the 2006 ROD. As such, and per the CERCLA Roadmap, the USCG will prepare an Explanation of Significant Differences (ESD) to document the remedy change as part of the Administrative Record. The USCG will conduct community relations activities associated with the ESD per the CERCLA Roadmap. Subsequently, the USCG anticipates that EPA will delist the site from the CERCLA NPL and issue No Further Action status for the site.

As of the date of this Second Five Year Review and based on the removal action completed in 2016, remedial action objectives (RAOs) have been met and the remedy is protective of human health and the environment.

## 5.0 PROGRESS SINCE THE PREVIOUS FIVE-YEAR REVIEW

Since the first Five-Year Review for the site, the site has been subject to the requirements of the long-term monitoring plan (LTMP). The results of the annual monitoring events since the first Five-Year Review indicated increasing concentrations of metals in the swale and wetland area. In 2013, the USCG conducted an additional study of the property to identify engineering corrective actions to reduce off-site migration of metals to the swale and wetland. A report was prepared entitled, "Evaluations of Options for Minimizing Off-Site Transport of Contaminated Sediment" (Watermark 2013). Based on a review of the options identified in the report, the USCG determined that excavation of impacted soils in the buoy storage area and replacement with clean fill would be the most cost effective and sustainable approach to eliminating off-site metals impacts. In 2015, the USCG conducted soil sampling throughout the buoy storage area, swale and wetland in order to prepare plans and specifications for remediation. In 2015, the USCG prepared a CERCLA Roadmap (AMEC 2015) to provide an overview of the regulatory activities necessary to conduct remediation of the site. The USCG subsequently prepared the following pre-remediation documents:

- Engineering Evaluation/Cost Analysis (EE/CA) (Tantara 2016)
- Action Memorandum (Tantara 2016a)
- Remedial Action Work Plan (RAWP)(Tantara 2016b)
- Sampling and Analysis Plan (SAP)(Tantara 2016c).

While not required in the CERCLA Roadmap, the EPA and MassDEP also required preparation of a Project Specific Quality Assurance Project Plan (QAPP) (Tantara 2016d). In August of 2016 and upon approval of the RAWP and SAP, the USCG commenced remediation of the site. As of the date of this Second Five Year Review, remediation of the entire site including the swale and wetland is substantially completed to cleanup goals that support unlimited use and unrestricted exposure. It is anticipated that this will be the final Five-Year Review for IPDSW and that EPA will delist the site from the CERCLA NPL upon completion of the remaining CERCLA Roadmap action items.

## 6.0 FIVE-YEAR REVIEW PROCESS

This section presents the process and findings of the second Five-Year Review; specifically, the findings of the document review, data review, ARARs review, site inspection, and site interviews.

### 6.1 Administrative Components

This Five-Year Review was completed by Mr. Michael Andrews and Ms. Rachel Marino of the USCG Civil Engineering Unit Providence.

In June 2016, the review team established the review schedule, which included the following components:

- Document review
- Data review
- ARARs review
- Site inspection
- Interviews.

### 6.2 Community Involvement

A public notice announcing the initiation of the Five-Year Review for the IPDSW site was published in the local newspaper, *The Patriot Ledger*, on 30 November 2016 (Appendix A).

Upon signature, a copy of the Second Five-Year Review Report will be available in the Administrative Record.

### 6.3 Document Review

The Five-Year Review included a review of relevant decision documents, implementation documents, remedy performance documents (monitoring documents), O&M documents, and legal documents. The document review focused on the documents required to implement the remedy including monitoring data, institutional controls, and engineering controls.

### 6.4 Data Review

The selected remedy from the ROD includes LUCs (i.e., institutional and engineering controls), long-term monitoring, and Five-Year Reviews. Data were reviewed from the long-term monitoring program and pre-remedial design soil sampling effort. In the first Five-Year Review, soil sampling data from the swale and wetland were analyzed using the Mann-Kendall test for trend at the 95 percent confidence level. For the second Five-Year Review, statistical analysis has not been completed because all impacted soils in the swale and wetland have been excavated to cleanup goals that support unlimited use and unrestricted exposure as of the date of this report. Any trends that would have been extrapolated from the data are inconsequential. The sections below provide general summaries of the data from the long term monitoring program and pre-remedial design soil sampling effort. All post excavation confirmation sampling results from the 2016 remediation project will be provided in the Remedial Action Closure Report.

#### 6.4.1 Wetland Soil Sampling

The wetland soil sampling data from ME-07, ME-08 and ME-09 has been compared for the second Five-Year Review. In general, concentrations of metals from the six sampling locations increased compared to the data evaluated from the first Five-Year Review. Concentrations of chromium, copper, lead and zinc exceeded their respective Remedial Goals in at least one location during each sampling

event. The chromium results from ME-07 and ME-08 exceeded the RG of 16 mg/kg in four out of 6 of the sample locations. Copper exceeded the RG of 1,020 mg/kg at a single sample location during both the ME-07 and ME-08 events and otherwise was below the RG. The RG for lead is 302 mg/kg. The RG for lead was exceeded during ME-07 and ME-08 at two locations and during ME-09 at a single location. Note that the cleanup objective for lead during the 2016 remediation project was 200 mg/kg in order to comply with the Massachusetts Contingency Plan (MCP) Method 1 Soil Category S-1 standard. The RG for zinc of 738 mg/kg was exceeded at one location during ME-08 but otherwise below the RG at all locations during each event.

The pre-remedial design sampling effort conducted in 2015 focused on the analysis of lead in the buoy storage area, swale and wetland. The lead concentrations in the wetland were generally consistent with the long term monitoring events and indicated exceedances of the RG of 302 mg/kg in multiple areas. At one location, lead was detected at 1,782 mg/kg which was significantly higher than the results from ME-07, ME-08 or ME-09. The pre-remedial design data was used to develop an excavation plan for the wetland. The entire wetland has been excavated to 6 inches below surface grade to remove metals impacted soil. In addition, two areas were excavated to 12 inches below surface grade to remove impacted soils. The results of all post-excavation confirmation sample data will be provided in the Remedial Action Closure Report. The wetland has been restored per the RAWP and will be re-vegetated as necessary in the Spring of 2017.

The wetland soil sampling data collected during the second Five-Year Review clearly showed that metals concentrations were increasing off-site. This data was used by the USCG to make the decision to completely remediate the site. By excavating impacted soils in the buoy storage area, the future migration of metals soils via runoff to the swale and wetland will cease.

#### *6.4.2 Swale Soil Sampling*

The swale soil sampling data from ME-07, ME-08 and ME-09 has been compared for the second Five-Year Review. The metals concentrations detected during ME-07 were significantly higher than any of the prior monitoring events. Of the six sample locations in the swale, chromium, copper, lead and zinc were all detected at concentrations exceeding the RGs during ME-07. In response to the ME-07 data, the USCG proposed the collection of four additional surface soil samples to be collected in the swale during the next long term monitoring event (ME-08). The purpose of the additional sample locations was to further characterize metals impacts within the drainage swale. In 2013, the ME-08 sample results confirmed the elevated metals concentrations detected during ME-07. Of the eleven ME-08 swale soil sample locations, eight exceeded the RG for chromium, copper and lead. Two of the locations exceeded the RG for zinc. For the ME-09 monitoring event in 2014, the USCG sampled the 6 original swale sample locations as specified in the ROD. By this time, the USCG was convinced that metals impacts in the swale were a direct result of the inability of the stormwater management system to effectively control the sediment. The additional sample locations included in the ME-08 monitoring event would not provide any value given that the swale was clearly impacted. The ME-09 results confirmed the ME-07 and ME-08 data. Of the six samples collected, five locations exceeded the RGs for chromium, copper and lead. The zinc concentrations from ME-09 were all below the ME-07 and ME-08 results.

The pre-remedial design sampling effort conducted in 2015 focused on the analysis of lead in the buoy storage area, swale and wetland. The lead concentrations in the swale were generally consistent with the long term monitoring events and indicated exceedances of the RG of 302 mg/kg in multiple areas.

As expected, the most elevated concentrations in the swale were closest to the headwall where the stormwater discharges. The highest concentration detected in the swale was from 6-12 inches below ground surface adjacent to the headwall. The concentration at this location was 802 mg/kg. A total of six of the twenty-one sample locations in the swale exceeded the RG for lead of 302 mg/kg. Seven locations exceed the cleanup objective for lead established for the remediation project of 200 mg/kg. The pre-remedial design data was used to develop an excavation plan for the swale. The entire swale has been excavated to 6 inches below surface grade to remove metals impacted soil. In addition, the area adjacent to the headwall was excavated 12 inches to remove metals impacted soils. The results of all post-excavation confirmation sample data will be provided in the Remedial Action Closure Report. The swale has been reconstructed with rip-rap per the RAWP to reduce stormwater flow velocity entering the wetland.

#### *6.4.3 Surface Water Sampling*

The surface water sampling was conducted as part of the ME-09 sampling event in 2014. Four surface water samples were collected per the requirements of the ROD. One sample was collected at the headwall where the Vortech system discharges to the swale and the other three samples were collected from standing water in the wetland. The results indicated that all metals concentrations decreased with distance from the headwall. Total chromium exceeded the RG at the headwall sample, however, all other locations were below the RG. Total and dissolved copper, lead and zinc concentrations exceeded their respective RGs at all locations. A summary of the surface water analytical results from the ME-09 monitoring event is provided in Appendix G.

#### *6.4.4 Groundwater Sampling*

Groundwater sampling activities were not conducted for the second Five-Year Review. Section 2.12.2.3 of the ROD requires groundwater sampling and analysis for the first Five-Year Review only.

#### *6.4.5 Annual Land Use Inspections*

The LUCIP requires an annual land use inspection to be performed at the site. The following land use inspections were performed over the second Five-Year Review period:

- **06 December 2012**—Noted asphalt berm damage, recent repairs to the polydrain, a recent inspection of the detention gallery and damage to the security fence. No other issues were identified.
- **23 September 2013**—Noted repairs to the security fence, repairs to the asphalt berms and vegetation removed in the infiltration trenches. No other issues were identified.
- **16 September 2014**—Noted that the bi-annual inspection of the detention gallery was completed on the day of the land use inspection. No other issues were identified.
- **24 September 2015**—No issues were identified.
- **29 September 2016**—Noted the soil management activities associated with the ongoing remediation work. Also noted that the detention gallery would not be inspected because it is scheduled to be cleaned out regardless of sediment accumulation levels as part of the remediation project prior to excavation in the swale and wetland area.

#### 6.4.6 Stormwater System Maintenance/Inspection Logs

As part of the Five-Year Review process, USCG reviewed maintenance and inspection logs which were required to be conducted on a quarterly basis during the five years of monitoring in accordance with the LUCIP. The quarterly inspections include:

- Vortechs stormwater treatment system
- Polydrain
- Catch basins (CB-1)
- Deep sump catch basins (CB-2, CB-3, and CB-4)
- Crushed gravel areas
- Earthen and asphalt berms
- Infiltration trenches.

Included in the inspection logs were solids thicknesses found in the Vortechs stormwater treatment system and in the drainage system catch basins. The Vortechs system has three manholes (MH-1, MH-2, and MH-3) and the drainage system has four catch basins (CB-1, CB-2, CB-3, and CB-4). Each manhole and catch basin has a designated solids thickness which, when reached, requires maintenance activities including removal of all solids.

During the Five-Year Review period, quarterly inspections were performed routinely to ensure proper performance of the installed engineering controls. Twenty inspections were performed during the Five-Year Review period. During this time, the collected solids in the Vortechs system were vacuumed out in 2012 and 2013. All catch basins were cleaned out in 2012 and CB-2 was cleaned again in 2013 based on sediment measurements.

Examination of the quarterly inspection records indicates that solids settled in the Vortechs system can be mobile and likely migrate downgradient of the stormwater treatment system. During the second Five-Year Review period, solids never accumulated to the level requiring a cleanout of the Vortech system. Rather, cleanouts were performed proactively based on recommendations from the first Five-Year Review. Given that solids were not accumulating significantly, it seems apparent that sediment bypass was likely occurring.

The drainage system catch basins inspection logs also indicate that solids may be migrating downgradient from these locations. Collected solids appear to be migrating from the catch basins downgradient of the system.

The detention gallery is required to be inspected every two years (bi-annually). Upon review of the maintenance and inspection logs, the detention gallery has been inspected on schedule with one exception. In 2016, the detention gallery was due for inspection however the USCG did not inspect the structure because a cleanout was scheduled as part of the site remediation project. The detention gallery was cleaned out on November 28, 2016 along with each of the catch basins, piping, and the Vortech system. Otherwise, sediment measurements did not warrant a cleanout of the detention gallery during the second Five-Year Review period.

#### 6.4.7 Buoy Management

The LUCIP includes a Buoy Management Plan, which provides best management practices for storage and scrapping of buoys manufactured prior to 1988 that are suspected to contain LBP. The IPDSW has maintained a log of all buoy serial numbers, date received, whether it is manufactured pre-1988,

and if it is in storage or refurbished back for use. If the buoy is pre-1988, the IPDSW performs a "swab test" to determine if the buoy contains LBP.

A review of the Incoming Buoy Log from 2011 to 2016 did not indicate any buoys containing LBP were received at the IPDSW. In addition, interviews with IPDSW staff indicated that the number of pre-1988 buoys still in service has been declining each year as older buoys are scrapped and replaced.

In addition, in 2007, all buoys in storage at the IPDSW were tested for the presence of LBP. Over 100 buoys in storage were identified as containing LBP. In 2008, those buoys identified as containing LBP were separated, removed from the IPDSW site, and scrapped. To the knowledge of the IPDSW staff, there are no longer any buoys containing LBP present at the facility.

#### 6.4.8 Soil Management

The LUCIP includes a Soil Management Plan that establishes protocols for the safe management of soil containing lead and paint chips (potentially lead-based) in the buoy storage area of the site. The Soil Management Plan includes procedures for re-grading, dust control, and excavation of soils at the IPDSW.

#### 6.4.9 Engineering Evaluation – Vortechs Unit

In 2008, an Engineering Evaluation of the Vortechs Unit was performed (EA 2008c). The objective of the study was to determine if the unit is functioning as designed. The study reviewed the design criteria, collected samples of sediment and water, reviewed maintenance records, and developed conclusions and recommendations. The study concluded that the unit was operating properly; however, samples of sediment and water collected in the unit exceeded the RGs for chromium, copper, and lead. Recommendations for improving the Vortechs operation included: (1) removing collected sediment at least once per year from each manhole in the Vortechs unit, (2) continue monitoring of the swale and wetland soils, and (3) an optional recommendation was to install filter inserts in the catch basins immediately upstream of the Vortechs to reduce the amount of solids reaching the unit. During the second Five-Year Review period, the USCG implemented the recommendation to remove sediment from the Vortech in 2012 and 2013. By 2014, it became clear that metals concentrations in the swale and wetland were increasing despite the annual cleanout efforts. From 2014 through 2016, the USCG planned and executed the remediation of the buoy storage area to remove the source of metals contamination that resulted in impacts to the off-site swale and wetland.

### 6.5 Applicable or Relevant and Appropriate Requirement Review

As part of this Five-Year Review, ARARs identified in the ROD (USCG 2006) were reviewed to determine if any newly promulgated or modified requirements of federal and state environmental laws have significantly changed the protectiveness of the remedies implemented.

The ROD divided ARARs pertaining to remedial activities for the site into chemical-, location-, and action-specific categories. Appendix B provides a summary table for site ARARs as presented in the ROD (USCG 2006).

#### 6.5.1 Chemical-Specific Applicable or Relevant and Appropriate Requirements

Chemical-specific ARARs are usually health or risk-based numerical values or methodologies used to determine acceptable concentrations of chemicals that may be found in or discharged to the environment. The ROD (USCG 2006) identified three chemical-specific ARARs pertaining to the site: (1) Risk Assessment Guidance – Cancer Slope Factors and Reference Doses, (2) EPA Region III Risk-Based Concentrations, (3) and EPA Region IX Preliminary Remediation Goals. The Risk Assessment Guidance is used in human health as guidance values to evaluate the potential carcinogenic hazard

caused by exposure to COCs. EPA Region III Risk-Based Concentrations are used as screening values to evaluate the potential hazards caused by exposure to COCs. EPA Region IX Preliminary Remediation Goals are generic risk-based concentrations that are intended to assist risk assessors and others in initial screening-level evaluations of environmental measurements. Since the ROD was finalized, EPA Region III Risk-Based Concentrations and IX Preliminary Remediation Goals (plus EPA Region VI Medium-Specific Screening Levels) have been consolidated into one country-wide screening level list available at: <http://www.epa.gov/reg3hwmd/risk/human/rb-concentration-table/Generic-Tables/index.htm>. The screening levels listed in these tables are updated to account for modified toxicity values or other factors. None of the screening values for the COCs at the IPDSW site (arsenic, chromium, copper, lead, nickel, and zinc) have changed since the ROD was finalized.

Further, the remedial action objectives for the IPDSW site were driven by ecological concerns; therefore any change to the above mentioned chemical-specific ARARs related to human health would have no impact on the implemented remedy at the site.

The cleanup objectives approved for the 2016 site remediation project are all less than or equal to the RGs from the 2006 ROD.

#### *6.5.2 Location-Specific Applicable or Relevant and Appropriate Requirements*

Location-specific ARARs restrict actions or contaminant concentrations in certain environmentally sensitive areas. The ROD identified five location-specific ARARs pertaining to the IPDSW site: Endangered Species Act of 1973, Executive Order 11990 Wetlands Protection, Fish and Wildlife Coordination Act of 1958 Protection of Wildlife Habitats, Massachusetts Wetlands Protection Regulations – 310 Code of Massachusetts Regulations, and Massachusetts Endangered Species Act 321 Code of Massachusetts Regulations 10.00. The Endangered Species Act requires federal agencies, in consultation with the U.S. Fish and Wildlife Service and/or NOAA Fisheries Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. Executive Order 11990 (Title 40, Code of Federal Regulations, Part 6, Appendix A) requires that no remedial alternative adversely affect a wetland if another practicable alternative exists. If no such alternative exists, impacts from implementation must be mitigated. The Fish and Wildlife Coordination Act of 1958 (16 United States Code 661) requires consultation with federal and state conservation agencies if alteration of a body of water, including the installation of monitoring wells in a wetland and/or discharge of pollutants into a wetland, will occur in order to provide adequate protection of fish and wildlife resources. Massachusetts Wetlands Protection Regulations (310 Code of Massachusetts Regulations 10.51–10.60) outlines requirements for all inland work that will remove, fill, dredge, or alter any bank, bordering vegetated wetland, land under water bodies and waterways, land subject to flooding, or riverfront area. The Massachusetts Species Act (321 Code of Massachusetts Regulations 10.00) prohibits the “taking” of any rare plants or animals listed as endangered, threatened, or special concern by the Massachusetts Division of Fisheries and Wildlife.

No changes to these regulations or other location-specific ARARs were identified during this review.

#### *6.5.3 Action-Specific Applicable or Relevant and Appropriate Requirements*

Action-specific ARARs are usually technology- or activity-based requirements, or limitations on actions or conditions involving specific substances. These requirements are triggered by the particular remedial activities that are selected to accomplish the remedy. Remedial construction is complete and the remedial action is ongoing; therefore, the action-specific ARARs are still applicable. For the 2016

site remediation project, the Engineering Evaluation / Cost Estimate (EE/CA) identified action-specific ARARs for implementation.

## 6.6 Site Inspection

A site inspection was conducted on 06 July 2016 to assess site conditions and the effectiveness of measures employed to protect human health and the environment. Attendees included: Mr. Michael Andrews, (USCG CEU Providence), Ms. Kathleen Schweitzer (USCG CEU Providence), and Mr. Matthew Audet (EPA Region 1).

Site inspection photographs are provided in Appendix H.

### 6.6.1 *Vortechs Stormwater Treatment System*

The Vortechs stormwater treatment system components were operable and in good condition at the time of the inspection. Photograph 1 (Appendix H) shows Vortechs manholes 2 and 3, respectively, both securely shut and in good condition.

### 6.6.2 *Polydrain*

Visual inspection of the polydrain indicated that it was operable and in fair condition. No debris or clogging was noted in the drain; however, the surrounding concrete is beginning to deteriorate (Appendix H, Photograph 4). Despite the condition of the concrete surface, the polydrain is still functional.

### 6.6.3 *Catch Basin and Deep Sump Catch Basins*

The catch basin and deep sump catch basins were operable and in generally good condition at the time of the inspection. Catch basin 1 and deep sump catch basins 2, 3 and 4 were secure and showed no evidence of debris or clogging (Appendix H, Photographs 7, 3, and 5, respectively).

### 6.6.4 *Crushed Gravel Areas*

The crushed gravel areas were in good condition at the time of the inspection. No deficiencies were noted.

### 6.6.5 *Earthen and Asphalt Berms*

The earthen and asphalt berms were in good condition during the inspection. The earthen berms will be restored as part of the 2016 site remediation project.

### 6.6.6 *Infiltration Trenches*

The infiltration trenches along the western boundary of the site were operable and in good condition at the time of the inspection (Appendix D, Photograph 6). The concrete berm located along the eastern edge of the infiltration gallery was in good condition and showed no cracks or signs of damage. The polyvinyl chloride pipe which connects the northern and southern portion of the infiltration trench was observed to be in good condition with no debris or blockage present. Standing water was not observed.

### 6.6.7 *Wetland and Swale Soil Sampling Points*

The wetland and swale soil sampling points along the eastern boundary of the site were not inspected due to dense vegetation growth. In addition, the swale and wetland soils have been excavated as part of the 2016 remediation project.

## 6.7 Site Interview

In accordance with the requirements of the Five-Year Review process, USCG conducted interviews to gain additional information about the status of the IPDSW site. Two USCG employees familiar with the IPDSW operations and stormwater management system were interviewed for the second Five-Year Review.

Mr. Keith Girouard, Environmental Protection Specialist at the USCG IPDSW site, did not express concerns regarding past or ongoing activities at the site. Mr. Peter Hooper, USCG IPDSW Supervisor indicated that all lead swab tests that have been performed on the pre-1988 buoys have come back negative.

## 7.0 TECHNICAL ASSESSMENT

Conclusions presented in this section support the determination that the selected remedy from the 2006 ROD did not function as designed in the decision documents. Results of soil sample data collected during the annual monitoring events since the first five year review indicated increasing metals concentrations in the swale and wetland areas. The USCG concluded that the increased concentrations were a direct result of the conveyance of metals impacted soils from the buoy storage area to the swale and wetland via stormwater runoff. Given that the stormwater management system at IPDSW was not functioning as intended to remove all contaminants from the stormwater flow, the USCG endeavored to execute corrective remedial actions in accordance with the CERCLA in 2016. As of the date of this second five year review, metals impacted soils within the buoy storage area, swale and wetland have been remediated to cleanup goals that support unlimited use and unrestricted exposure for unrestricted exposure and unlimited use of the site. In addition, the swale and wetland cleanup goals were selected to eliminate unacceptable risk to environmental receptors.

EPA guidance indicates that to assess the protectiveness of a remedy, three questions (Questions A, B, and C identified in the sections below) shall be answered.

7.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

Answer A: YES

7.2 Question B: Are the Assumptions Used at the Time of Remedy Selection Still Valid?

Answer B: Yes

7.3 Question C: Has Any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

Answer C: No

7.4 Technical Assessment Summary

After documents and data were reviewed and the site inspection and interviews completed, the USCG determined that the remedy described in the 2006 ROD did not function as intended. In response, the USCG attempted to take corrective actions including more frequent cleanouts of sediment in the Vortech unit to reduce off-site migration of metals to the swale and wetland and continued O&M of the site in accordance with the ROD. Based on an evaluation of alternatives to minimize off-site transport of contaminated sediment, the USCG concluded that excavation of impacted soils in the buoy storage area, swale and wetland was the most practical solution. As of the date of this five year review, metals impacted soils at IPDSW have been excavated and no longer pose a threat to contaminate off-site property via stormwater runoff.

## 8.0 INSTITUTIONAL CONTROLS

Institutional controls are non-engineered instruments such as legal and administrative tools that do not involve construction or physical changes to the site, and which help minimize the potential for human exposure to contamination. Additionally, institutional controls protect the integrity of a remedy by limiting land and/or resource use, and may include easements, restrictions, or other conditions on deeds, and/or groundwater, and/or land use restriction documents (EPA 2000). The following sections describe the institutional controls implemented at the site, potential effect of future land use plans on institutional controls, and any plans for changes to site contamination status.

8.1 Types of Institutional Controls in Place at the Site

USCG implemented institutional controls in the form of a USCG Instruction delineating the property use restrictions while the property is controlled by the USCG and deed restrictions in the event of any transfer of the IPDSW property. These controls prohibit future uses of the IPDSW property for which lead and paint chips in soil may be unacceptable. These uses include residential use; certain recreational uses; agricultural use; use involving facilities with children under the age of 6, such as daycare centers or playgrounds; or use as wildlife habitat without further evaluation. The institutional controls remain in effect unless and until mitigation measures are taken to reduce lead concentrations in soil to levels that allow for unlimited use and unrestricted exposure on the property. The institutional controls are implemented in accordance with the LUCIP.

The final LUCIP was issued in December 2010 (EA 2010b) and provides the plans and procedures for implementing the controls. The LUCIP provides the rationale, applicability, and implementation of the LUCs. In addition, since the implementation of LUCs is a requirement of the ROD (USCG 2006), the LUCIP provides detailed procedures and plans including:

- Soil Management Plan
- LBP Buoy Management Plan
- O&M Plan for the Stormwater Management System
- Annual LUC Compliance Checklist.

The USCG anticipates that once EPA delists the site from the CERCLA NPL, institutional controls at the site will no longer be required since mitigation measures have been taken to reduce lead (and other metals) concentrations in soil to levels that allow for unlimited use and unrestricted exposure on the property

## 8.2 Effect of Future Land Use Plans on Institutional Controls

The current land use of the IPDSW property is industrial. Since 1972, the IPDSW has been the USCG's principal facility in the Northeast for storing, cleaning, repairing, and painting navigational buoys. The USCG plans to continue the current industrial operations at the IPDSW property.

The portion of the site on Navy and LSTAR Management, LLC property (i.e., the stormwater drainage swale and wetland areas that were remediated under the Non-Time-Critical Removal Action) is currently open space. There are various plans for redevelopment, including potential residential use, for the property abutting the USCG facility. Under the current reuse plan and approved zoning and reuse bylaws, the wetland and a portion of the swale that is within 50 ft (buffer zone) of the delineated wetland boundary is now zoned as Open-Space-Weymouth District. The portion of the swale that is not within the 50 ft of the delineated wetland is currently zoned Village Center District. The swale and wetland portions of the site have been remediated to cleanup goals that support unlimited use and unrestricted exposure and eliminate unacceptable risks to environmental receptors.

The IPDSW property itself was already transferred from the Navy to the USCG in accordance with the Base Realignment and Closure Act, and is not currently available for transfer. The USCG has no plans to transfer the IPDSW property; and, as the property remains governmentally owned, it is exempt from local zoning requirements. If it were transferred at some time in the future, the land would be zoned as Village Center District.

## 8.3 Plans for Changes to Site Contamination Status

It is anticipated that EPA will delist the site from the CERCLA NPL once the USCG completes the remaining action items identified in the CERCLA Roadmap. The CERCLA Roadmap was approved

by EPA and MassDEP prior to initiation of site remediation activities at the site. Once delisted, USCG anticipates that No Further Action status will be assigned to the site.

## 9.0 ISSUES

Based upon the removal action taken by the USCG in 2016 to remediate the IPDSW site, the USCG has determined that there are no issues to report.

## **10.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS**

Because no issues were identified in Section 9.0, the USCG has determined that there are no recommendations or follow-up actions necessary.

**11.0 PROTECTIVENESS STATEMENT**

<b>Sitewide Protectiveness Statement</b>	
<i>Protectiveness Determination:</i>	Protective
<i>Protectiveness Statement:</i>	The remedy at OU10 is protective of human health and the environment.

**12.0 NEXT REVIEW**

It is anticipated that this will be the final Five-Year Review for the IPDSW site. Once the site is delisted from the CERCLA NPL, Five-Year Reviews will no longer be required.

### 13.0 REFERENCES

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**Table 1**  
**Chronology of Site Events**  
**Second Five Year Review**  
**USCG Buoy Depot, South Weymouth, Massachusetts**

Date	Event
1972 - 1973	Buoy Depot Site facility construction completed.
1973 - 1986	Site operations include buoy rehabilitation (e.g. "shot blasting" to remove old paint, welding, painting, electrical wiring); minor vehicle and equipment maintenance; waste generation (steel shot blast residue, waste oils, paint-related waste) and fuel storage; warehousing; outdoor scrap metal storage; and administrative use. Old or damaged buoys beyond repair are stored at Buoy Depot pending sale as scrap metal. During this time the USCG used lead-based paint and primers for buoys.
1986	The USCG stopped buying lead-based paint and primers.
1988	The USCG is required to deplete their existing lead paint inventory.
16 April 1988	The Potential Hazardous Waste Site Preliminary Assessment (PA) report identified the facility's United States Environmental Protection Agency (EPA) identification number as MA069033078. The PA reported the use and generation of "solvents", "paint chips", and residue from "sandblasting", "lead-based paint," and "waste lubrication oil". The report noted that there were "about 30 ft <sup>2</sup> of soil that appeared to have been contaminated by waste oil from the facility. Indications are that it was less than 55 gal and that it only affected the surface soil."
December 1991	The Site Investigation Report (Baker 1991), based on a limited number of monitoring wells, suggested that groundwater flowed generally towards the northeast in the vicinity of the Navy's West Gate Landfill. Baker Environmental reported no significant levels of groundwater contaminants present in two monitoring wells located hydrologically upgradient of the Landfill. These two wells are located downgradient of the Buoy Depot.
April 1993	The brief Environmental Compliance Evaluation (USCG 1993) indicated that painting-related solvents were being recycled and that the "sandblasting" waste generated on the site was non-hazardous. The report indicates a description of the use of waste oil as a form release agent for concrete buoy sinker castings. The report indicates that no waste paint or waste solvent was generated, and that small amounts of batteries were occasionally collected and recycled.
February 1996	The Initial Assessment Survey (PSI 1996) contains most of the features of a Phase I Environmental Site Assessment or Environmental Baseline Survey (EBS) type investigation including a site inspection, interviews, and records review. The report recommended performance of a subsurface evaluation due to the age (1973) of the building. Figures and photographs indicated that the southernmost portion of the Buoy Depot had not been filled and brought to its current grade at the time of this inspection. Also the small swale, which formerly directed surface water flow from east to west across the southern end of the Buoy Depot, and the former railroad spur were still present.

Table 1 Continued

Date	Event
November 1996	The Navy EBS presents the findings of the EBS for the entire NAS and includes a section on the USCG Buoy Depot (identified in "Zone F"). The Phase I EBS identified three Phase II review item areas (RIAs) pertaining to the Buoy Depot. RIA 57 was listed as waste oil-stained soil associated with concrete sinker fabrication. A removal action was completed in accordance with the Massachusetts Contingency Plan [MCP]; RIA 58 was listed as a second onsite septic system (does not exist and no further action required); and RIA 59 was listed as a reported hazardous waste container storage (no further action has been proposed).
1996	Since most buoys are refurbished every 6 to 8 years, by this time most of the USCG's buoys in the storage area have been cycled through the system and have been re-painted with non-lead-based paint.
April 1997	The Environmental Inspection report identified a "6-ft diameter area of contaminated soil outside of the paint mixing area" related to past fueling practices where diesel fuel was formerly dispensed from a 55-gal drum.
June 1997	The Environmental Compliance Evaluation report indicates that the petroleum-impacted (i.e., diesel fuel) soils mentioned in previous reports would be removed on 18 June 1997. The report states that the process of plugging floor drains with concrete was being performed (although they had been reportedly plugged with debris for some time).
28 July 1997	The Release Tracking Number (RTN) associated with the 1997 Release Abatement Measure was 3-15182. The Class A-2 Response Action Outcome (RAO) was submitted 7/28/97. The report details the excavation, sampling, and disposal of the surficially impacted soils (diesel fuel) identified in several previous reports. The impacted area was found to be roughly 18 ft in width and length and extended to a depth of 8 ft below grade. The report concludes that although low levels of fuel constituents were still present in soil and groundwater, applicable remediation standards had been met and the expenses associated with additional remediation were not warranted. 185.47 Tons or 115 yd <sup>3</sup> of soil were removed.
March 1998	<p>The USCG EBS was performed as part of an evaluation of the 5.5 acres of land that was under lease by the USCG from the NAS South Weymouth in anticipation of acquiring the land when the Base closed. The EBS identified eight Areas of Environmental Concern (AECs).</p> <ul style="list-style-type: none"> <li>• AEC 1 (Building and adjacent areas to south) - use/storage of paint, thinners, and oils, as well as the former generation of D008 hazardous wastes.</li> <li>• AEC 2 (Septic tank) - the potential discharges of hazardous substances to the septic tank.</li> <li>• AEC 3 (Possible former septic system) - potential discharges of hazardous substances to a septic system. Found not to have been installed.</li> <li>• AEC 4 (Sandblast residue piles) required appropriate characterization and disposal. Residue from sandblasting was observed beneath the dust collector located on the southwest corner of the building and piles of apparent sandblast wastes were noted immediately west of this area.</li> <li>• AEC 5 (Staining around dust collection system) pertains to rust-colored staining observed on the concrete pad beneath the former dust collection system, as well as on the adjacent asphalt and process stone surfaces. The USCG determined that this staining originated from rusting steel grit that was used for sandblasting.</li> </ul>

Table 1 Continued

Date	Event
	<ul style="list-style-type: none"> <li>• AEC 6 (Soil remediation area) was remediated/closed as part of a Release Abatement Measure (RAM) completed in July 1997 in accordance with the MCP. Also, in 1981 the USCG filed a Part A Permit for the storage of waste batteries containing potassium hydroxide electrolyte. This permit filing indicated that a 12,100-gal tank had been used for storage of electrolyte. The EBS research indicated that the permit was filed under the incorrect assumption that the cumulative volume of electrolyte in individual batteries and subsequently, the total volume of caustic electrolyte to be stored, constituted hazardous waste container storage (i.e., tank storage). No storage tank was actually present onsite and no releases of electrolyte fluid were noted or reported during HRP's EBS. Therefore, no additional investigation of this hazardous waste container storage area was required.</li> <li>• AEC 7 (Septic leach field) pertains to unknown potential discharges, including former floor drain discharges. According to USCG, the floor drains near the overhead doors in the main building never discharged to the septic leach field, as was formerly believed. Soil and groundwater samples were recommended to be collected directly beneath these two floor drains and beneath a third floor drain which formerly discharged via pipeline from the Electrical Room to the former drainage swale along the western property boundary.</li> <li>• AEC 8 (Buoy, equipment, and scrap metal storage area) pertains to historic flaking of lead-based paint on buoys and in the construction debris disposal area, drums of metal turnings, and former solvent still present in the area. According to USCG, the container observed on the southeast corner of the Buoy Depot during the EBS was incorrectly identified as a solvent still. Solvent still bottoms are accumulated in a 90-day storage room inside the southeast corner of the building.</li> </ul>
September 1998	<p>The Phase II Environmental Site Assessment was conducted in July 1998 to determine the environmental impact, if any, from the AECs documented in the EBS. On-site activities included a ground-penetrating radar (GPR) investigation and the installation of test borings to collect soil and groundwater samples.</p> <p>Groundwater conditions in the area of the suspected former septic system/leach field could not be evaluated due to the presence of buoys. A record search identified "as-built" drawings with only one leach field installed in the existing location. On 2 November 1998, the USCG excavated a trench in the assumed location of the suspected former septic system/leach field (AEC 3). No gravel or piping was encountered in the trench and no other visible evidence of a septic system/leaching field was observed, thereby confirming that a leaching field was not installed in this area.</p> <p>At the time of the Phase II EBS, the operations at the USCG Buoy Depot and surrounding properties placed the Buoy Depot's soil and groundwater in MCP reporting categories RCS-2 and RCGW-2, respectively. Based upon the results of this investigation, there were some surficial lead concentrations in soil above 2,000 mg/kg. In the area of the dust collector and in the southeast corner of the property, lead concentrations exceeded the MCP's RCS-2 value of 600 mg/kg. Lead was also reported in four groundwater samples (GW3-1, GW3-2, GW7-2, and GW8-8) above the RCGW-2 reporting limit of 0.03 mg/L. Accordingly, HRP recommended additional investigation and that the scope should include the installation of permanent monitoring wells. The lead was reported in turbid, unfiltered groundwater samples that were collected using direct-push techniques.</p>

**Table 1 Continued**

Date	Event
	<p>Therefore, the results may not have been representative of the actual conditions in groundwater (lead concentrations may potentially have been in the soil matrix but reported in groundwater due to the sampling technique).</p> <p>Since the time when the EBS report was published, MADEP assigned the GW-1 classification to groundwater beneath the Buoy Depot and has determined that the facility is located within an aquifer protection district. Details were provided in MADEP's "Groundwater Use and Value Determination" (letter to EPA dated 13 January 1999).</p>
February 1999	<p>The State of Massachusetts inspected the existing subsurface sewage disposal system on 5 February 1999. The documentation indicates that the system passed an onsite Subsurface Sewage Disposal System Inspection; therefore, the septic system meets the State of Massachusetts Title V requirements. The recommendation called for slight regrading to eliminate ponding in the leach field area.</p>
March 1999	<p>Tetra Tech NUS, Inc. issued a Phase I Initial Site Investigation Report on the Jet Fuel Pipeline Site. This site is located approximately 150 ft from the Buoy Depot's eastern gate. The results of this investigation concluded that residual petroleum concentrations contained within the soil and groundwater are in excess of applicable MCP Method 1 standards. Further investigations were recommended.</p>
1999	<p>EA collected water levels at 36 wells and piezometers in the area for a Groundwater Flow Evaluation. However, only one well was located on the USCG property. Given the locations of the available data points, the study was limited. Based on the available data, EA interpreted the groundwater flow to be generally to the southeast across the Buoy Depot.</p>
1999	<p>The USCG contracted Clean Harbors to conduct soil testing and a final "vacuum sweep" outside of the USCG Buoy Depot's property boundary for the USCG Paint Chip Removal Action. Prior to removal of the paint chips, Clean Harbors collected two soil samples and two paint chip samples and sent them to the laboratory to be analyzed for TCLP-lead.</p>
1999	<p>TGG Environmental Inc. (TGG) was contracted by Unified to summarize and evaluate information generated by a sampling subcontractor, South Shore Lead Paint, and Logano Waste Management, the waste transporter and landfill management company in the USCG Dust Collection System Removal Action.</p> <p>During construction activities associated with the replacement of the dust collection system, soil was excavated and stockpiled in drums, on 6-mil polyethylene sheeting and subsequently in rolloff containers. Prior to any excavation, in March 1999 contractors collected 4 soil samples from the perimeter of the original concrete pad holding the baghouse. Total lead content of these samples ranged from 10,748 to 26,417 mg/kg.</p> <p>On 29 March 1999, Unified received permission from the USCG to remove soil. Reportedly, in April, soil and gravel to a depth of 15 in. were removed from a 2-ft area surrounding the concrete pad and placed in 6 steel drums and then to rolloffs. Unified removed another 6 in. of soil in the 44 x 50 ft area, prior to installing the concrete pad now in place.</p> <p>The USCG issued a final Time-Critical Removal Action Memorandum in June 2004 to retroactively document the decision for the completed removal action.</p>

Table 1 Continued

Date	Event
June 1999	In the Phase II EBS Field Reports, the Navy limited the investigation to surface water and sediment sample collection and analysis south of the USCG parcel and installation of two wells, one well at the southwestern corner of the USCG property, and one offsite and upgradient of the parcel.
February 2001	<p>The purpose of the Remedial Investigation (RI) Report was to evaluate the nature and extent of chemical constituents related to AOCs identified in previous investigations that may pose a threat to public health and the environment and to quantify the potential risk to human health and the environment from exposure to these chemicals. The RI included site characterization, baseline human health, and ecological risk assessments, an evaluation of chemical fate and transport, and preliminary identification of potential remedial alternatives.</p> <p>Field activities for the RI included field screening for metals in soil and volatile organic compounds (VOCs) in soil, groundwater, and hydric soil sampling; monitoring well and piezometer installation; groundwater gauging and water level measurements; hydraulic conductivity testing; and a professional land survey of the sampling locations and monitoring wells.</p>
January 2002	<p>Supplemental sampling to support the Feasibility Study (FS) was performed by EA in January 2002 in support of the Feasibility Study for the Buoy Depot. This investigation consisted of the following activities:</p> <ul style="list-style-type: none"> <li>• Sampling of shallow subsurface soil on-depot and analysis for methyl isobutyl ketone (MIBK, or 4-methyl-2-pentanone) to address MADEP concerns regarding a previous detection at location SB017.</li> <li>• Sampling of hydric soil within the drainage swale and analysis for six COC metals to delineate impacts and support selection of the appropriate remedial alternative.</li> <li>• Sampling of hydric soil and surface water to assess the extent of impacts in the wetland. Soil sampling was performed but, to date, insufficient precipitation has occurred to allow collection of surface water samples.</li> <li>• Installation of two additional monitoring wells and sampling of the new and existing monitoring wells to support the risk assessments for ground water. The compound 1,4-dioxane was added to the analyte list at the request of the MADEP.</li> </ul>
December 2002	The Engineering Evaluation/Cost Analysis (EE/CA) was conducted in accordance with CERCLA/SARA to provide the basis for a Non-Time Critical Removal Action (NTCRA) for hydric soil/sediment in the swale and wetland area as well as subsurface soil around the floor drain system of the Buoy Depot building. The USCG also incorporated the results of the supplemental sampling round and the updated human health and ecological risk assessments.
January 2003	The Wetland Assessment, Appendix A of the Non-Time Critical Action Memorandum, was conducted in the swale and wetland area in late 2002 to support the non-time critical removal action and evaluate potential impacts of the action.
August 2004	In February 2003, the USCG conducted a CERCLA Non-Time Critical Removal Action that included the removal of the building's floor drain system, the floor drains' contents (sludge/sediment), and some of the surrounding soil. Excavated materials were transported offsite for final disposal.
29 September 2006	Record of Decision (ROD) selecting the final remedy (land-use controls, long-term monitoring, and Five-Year Reviews) signed
April 2007	Planting of 60 containerized plants in swale

**Table 1 Continued**

<b>Date</b>	<b>Event</b>
June 2007	Long-Term Monitoring Event No. 1 – groundwater, surface water, soil in swale, and wetland sampled
August 2007	Long-Term Monitoring Event No. 1 report submitted.
September 2007	Long-Term Monitoring Event No. 2 – swale and wetland soils sampled
September 2007	Final Long-Term Monitoring Plan
March 2008	Draft Land Use Control Implementation Plan
June 2008	Long-Term Monitoring Event No. 3 – swale and wetland soils sampled
June 2009	Long-Term Monitoring Event No. 4 – swale and wetland soil sampling
June 2010	Long-Term Monitoring Event No. 5 – swale and wetland soil sampling
December 2010	Final Land Use Control Implementation Plan
June 2011	Long-Term Monitoring Event No. 6 – swale and wetland soil sampling
December 2011	First Five-Year Review
July 2012	Long-Term Monitoring Event No. 7 – swale and wetland soil sampling
June 2013	Long-Term Monitoring Event No. 8 – swale and wetland soil sampling
January 2014	Evaluation of Options for Minimizing Off-Site Transport of Contaminated Sediment from the Storm Water Management System
June 2014	Long-Term Monitoring Event No. 9 – swale, wetland soil sampling and surface water sampling
March 2015	CERCLA Roadmap
March 2015	Final Field Sampling Report for Pre-Design Characterization of Lead Impacted Soil – buoy storage area, swale and wetland sampling
May 2015	Final Field Sampling Report Addendum
February 2016	Final Engineering Evaluation / Cost Analysis
February 2016	Community Relations Activities Associated with EE/CA
April 2016	Final Action Memorandum
July 2016	Second Five-Year Review Site Inspection
August 2016	Final Remedial Action Work Plan
August 2016	Final Sampling and Analysis Plan
August 2016	Final Project-Specific Quality Assurance Project Plan
September 2016	Complete Remediation in Phase I (Buoy Storage Area)
October 2016	Additional Soil Sampling Adjacent to IPDSW Building
October 2016	Complete Remediation in Phase II (Buoy Storage Area)
November 2016	Complete Remediation in Phase III (Buoy Storage Area)
December 2016	Complete Remediation in Phase IV (Swale/Wetland Areas and Adjacent to IPDSW Building)



2000 0 2000 Feet

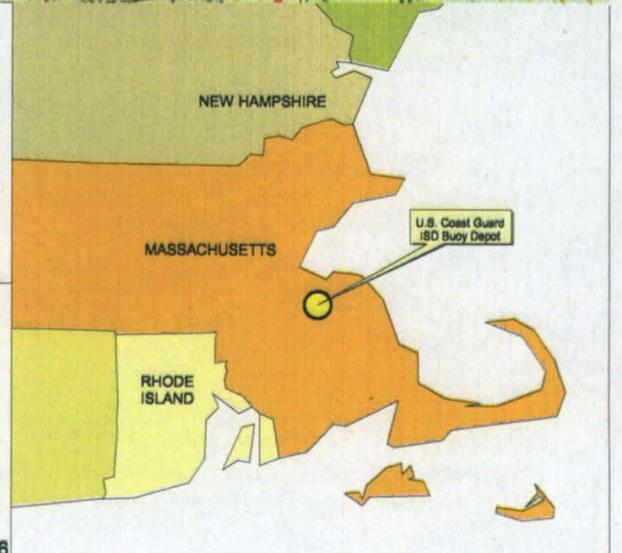


town line



**Watermark**

Figure 1  
Site Locus Map



**Taken from Watermark's 2015  
LTM Event 09 Report**

Pulte Homes of New  
England, LLC property  
(forested)

Massachusetts Bay  
Transportation Authority  
(parking for commuter rail)



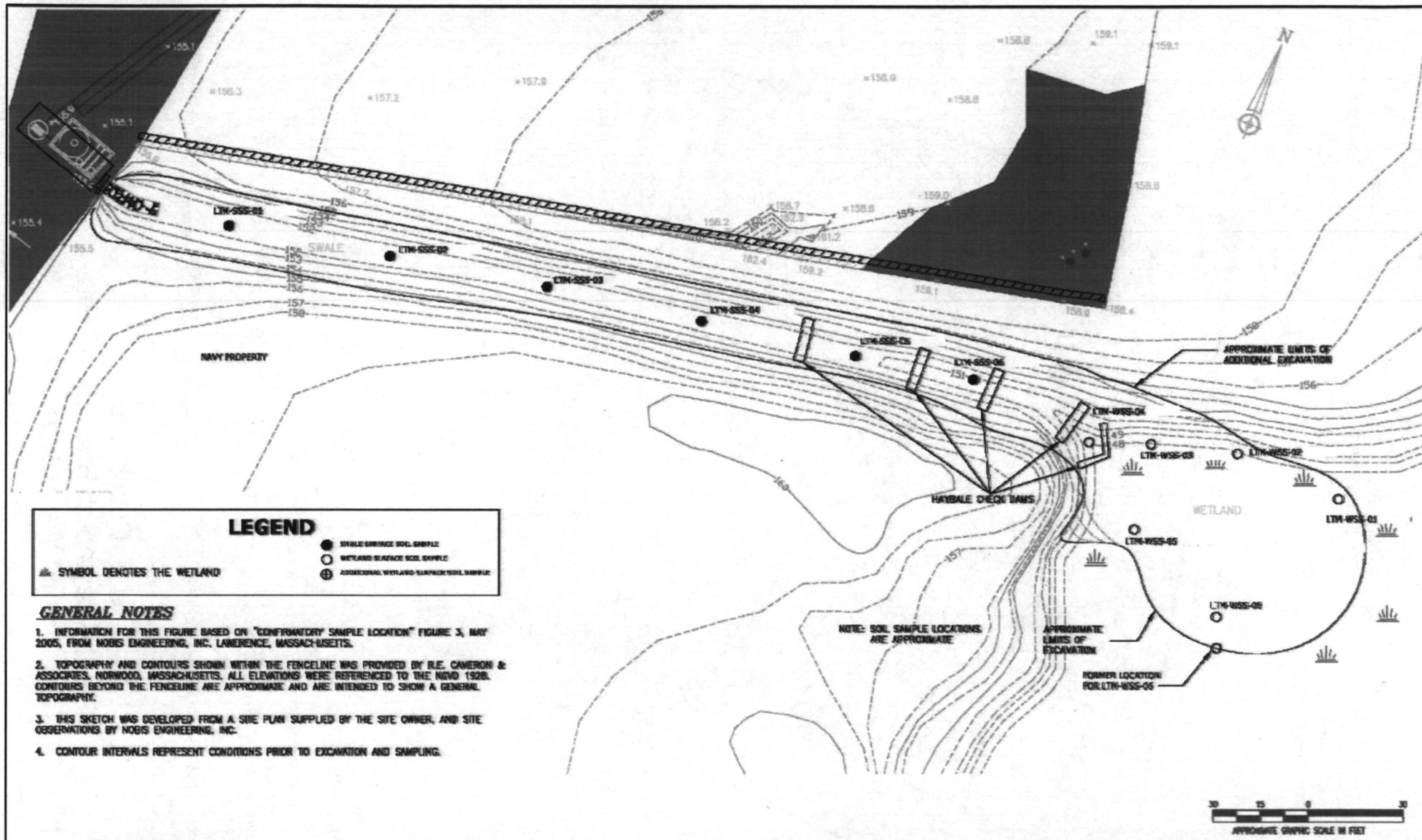
- LEGEND**
- buildings/structures
  - roadways (paved or dirt)
  - The IPDSW Site
  - The IPDSW property (fenceline boundary)
  - IPDSW Operations Building
  - IPDSW property and extent of Land Use Controls
  - Topographic Contours
  - 2-ft intervals
  - Completed Removal Action for the swale and wetlands
  - Wetland Delineation

100 0 100 Feet



**U.S. Coast Guard  
South Weymouth Buoy Depot Site  
South Weymouth, MA**

**Figure 2  
Site Map**



UNITED STATES COAST GUARD  
 BUCY DEPOT  
 SOUTH BEND, MA

FIGURE 3  
 SWALE SURFACE AND WETLAND SURFACE  
 SOIL SAMPLE LOCATIONS

DESIGNED BY LT	DRAWN BY I.T	DATE July 2011	PROJECT NO. 11017-00	FILE NAME
CHECKED BY LP	PROJECT MGR. I.P	SCALE As Shown	DRAWING NO. -	FIGURE 3

# APPENDIX A

**ew  
day**

**Waste Removal**

**WASTE SVC**  
Prices. Roll off  
containers. Fast  
188-781-3377

**General Help**

**PATCHERS &  
DRIVERS**  
Knowledge  
must Apply  
Cowan's Taxi  
Ave. Brockton

**Auctions**

**AUCTION**  
12/1, 6pm.  
Dav Hall,  
St. Braintree  
Norwell & E.  
ates including  
rains, sterling,  
rpets, prints,  
partial list  
Auctioneers  
isers, Inc.  
81-826-8648  
caddigan  
eers.com

**Fuel Oil**

**DAY FUEL**  
19-7733  
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**Automobiles**

**IR ASSUM-**  
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D, 2,200 mi.  
517-698-1862



**ICES**

**Legals**

**Quincy  
IVATION  
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**Legals**

**BUOY DEPOT SITE,  
SOUTH WEYMOUTH  
LEGAL NOTICE  
FIVE-YEAR REVIEW  
NOTICE  
FOR UNITED STATES  
COAST GUARD (USCG)  
INDUSTRIAL  
PRODUCTION  
DETACHMENT SOUTH  
WEYMOUTH  
SITE (IPDSW) SOUTH  
WEYMOUTH, MA**

The USCG is conducting the Second Five-Year Review for the USCG Buoy Depot Site located at 65 Trotter Road in South Weymouth, Massachusetts. EPA ID No. MA0690330758.

The Second Five-Year Review will evaluate the implementation and performance of the selected remedy in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, and the associated laws and regulations commonly known as "Superfund" to determine if the remedy is protective of human health and the environment. The Record of Decision (ROD) was signed 29 September 2006. The Selected Remedy includes Land Use Controls (Institutional and Engineering Controls), Long-Term Monitoring, and Five Year Reviews for AOC 3 (Buoy Equipment, and Scrap Metal Storage Area). The Five Year Review process will be completed by January 2017. The public is encouraged to review the information provided in the Administrative Record, which is available for review at the Former Naval Air Station, South Weymouth, MA and at local library repositories:

Navy Caretaker Site  
Office  
c/o David Barney  
1134 Main Street,  
Building 11  
South Weymouth, MA  
02190  
(617) 753-4656

For any questions regarding the Second-Five Year Review please contact:

Mr. Michael Andrews  
Environmental Engineer  
USCG Civil Engineering  
Unit Providence  
475 Kilvert Street,  
Suite 100  
Warwick, RI 02886  
(401) 736-1706

13509105 11/30/16

LEGAL NOTICE

**Legals**

**MORTGAGEE'S NOTICE  
ESTATE**

By virtue and in execution contained in a certain Mortgage Master, in assigns, dated May 3, 200 Norfolk County Registry of Page 141 subsequently National Association as true Mortgage Trust 2005-9 e Registration Systems, in nominee for Mortgage Ma and/or assigns by assign Registry of Deeds at Boc which Mortgage the unde holder for breach of the cor and for the purpose of fore at Public Auction at 2:00 P at 418 Sea Street, Quincy, premises described in said

A certain parcel of land w situated in that part of said Commonwealth of Massa Shore, being shown as Lc on plan entitled, Plan of Hous Quincy, Mass., owned by W. Branch, CE, dated Sep ed with Norfolk Deeds in P and being bounded and SOUTHWESTERLY by 182.36 feet; NORTHEASTI unknown, 60.04 feet; SOU owner unknown, 84.65 square feet of land more c plan. For my title see deed

The premises are to be sol benefit of all easements, r zoning laws, liens, attorne suant to M.G.L.Ch. 183A, water bills, municipal liens, of tenants and parties in po

**TERMS OF SALE:**  
A deposit of FIVE THOUS CENTS (\$5,000.00) in the l bank treasurer's check c required to be delivered a bid is offered. The auc required to execute a Fore immediately after the close ance of the purchase price ly (30) days from the sale t tified check, bank treasur satisfactory to Mortgage Mortgagee reserves the rig reject any and all bids, to amend the terms of the announcement made befo sure sale. If the sale is s the Purchaser at the sale t return of the deposit pai have no further recourse a Mortgagee or the Mortg description of the premises gage shall control in the publication. **TIME WILL BI**

Other terms if any, to be an

U.S. Bank National Asso Adjustable Rate Mortgage

Present Holder of said Mor By its Attorneys,  
ORLANDS MORAN PLLC  
PO Box 540540  
Waltham, MA 02454  
Phone: (781) 790-7800  
16-001116

13502293 11/16,23,30, 21

**APPENDIX B**

**Applicable or Relevant and Appropriate Requirements and to be Considered Guidance for the Selected Remedy:  
Land Use Controls (Institutional Controls and Engineering Controls), Long-Term Monitoring, and Five-Year Reviews**

<b>CHEMICAL SPECIFIC</b>					
<b>Authority</b>	<b>Applicability</b>	<b>ARAR</b>	<b>Requirement Synopsis</b>	<b>Action to be taken to attain ARAR</b>	<b>Status</b>
Federal	All	Risk Assessment Guidance - Cancer Slope Factors and Reference Doses	Used in human health risk assessments as guidance values to evaluate the potential carcinogenic hazard caused by exposure to chemicals of concern (COCs).	None (used for risk calculations)	To Be Considered
Federal	All	EPA Region III Risk-Based Concentrations	Used as screening values to evaluate the potential hazards caused by exposure to COCs.	None (used for risk calculations)	To Be Considered
Federal	All	EPA Region IX Preliminary Remediation Goals	Generic risk-based concentrations that are intended to assist risk assessors and others in initial screening-level evaluations of environmental measurements.	None (used for risk calculations)	To Be Considered
<b>LOCATION SPECIFIC</b>					
<b>Authority</b>	<b>Applicability</b>	<b>ARAR</b>	<b>Requirement Synopsis</b>	<b>Action to be taken to attain ARAR</b>	<b>Status</b>
Federal	Species, Habitat	Endangered Species Act of 1973	Requires federal agencies, in consultation with the USFWS and/or NOAA Fisheries Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species.	No federally-listed endangered species have been identified in the vicinity of the Buoy Depot. However, endangered or threatened federally-listed migratory bird species may pass through this area. Therefore, appropriate measures must be taken during monitoring events or future actions to ensure that such species and their habitat are not adversely affected.	Relevant and Appropriate
Federal	Wetlands	Executive Order 11990; Wetlands Protection, 40 Code of Federal Regulations (CFR) Part 6, Appendix A	Requires that no remedial alternative adversely affect a wetland if another practicable alternative exists. If no such alternative exists, impacts from implementation must be mitigated.	No wetlands are located on the Buoy Depot; however, wetlands are located adjacent to the Buoy Depot. Potential impacts to wetlands from monitoring events or any future actions at the Site will be avoided, in accordance with this order. If there is no practicable alternative to such remedial actions, unavoidable impacts to wetlands from these actions will be mitigated.	Relevant and Appropriate

**APPENDIX B-Continued**

<b>LOCATION SPECIFIC (Continued)</b>					
<b>Authority</b>	<b>Applicability</b>	<b>ARAR</b>	<b>Requirement Synopsis</b>	<b>Action to be taken to attain ARAR</b>	<b>Status</b>
Federal	Wetlands	Fish and Wildlife Coordination Act of 1958 (16 U.S.C. 661) Protection of Wildlife Habitats	Requires that the United States Fish and Wildlife Services and National Marine Fisheries Service be consulted if alteration of a body of water, including the installation of monitoring wells in a wetland and/or discharge of pollutants into a wetland will occur. This is to provide adequate protection of fish and wildlife resources. Requires consultation with state agencies to develop measures to prevent, mitigate, or compensate for project-related losses to fish and wildlife.	No wetlands are located on the Buoy Depot; however, wetlands are located adjacent to the Buoy Depot. Potential impacts to wetlands from monitoring events or any future actions at the Site will be avoided in accordance with this order. If there is no practicable alternative to such remedial actions, unavoidable impacts to wetlands from these actions will be mitigated.	Relevant and Appropriate
State	Wetlands	Massachusetts (MA) Wetlands Protection Regulations - 310 Code of MA Regulations (CMR) 10.51 - 10.60	Outlines requirements for all inland work that will remove, fill, dredge or alter and bank, bordering vegetated wetland, land under water bodies and waterways, land subject to flooding, or riverfront area.	No wetlands are located on the Buoy Depot; however, wetlands are located adjacent to the Buoy Depot. Potential impacts to wetlands from monitoring events or any future actions at the Site will be avoided, to the extent possible, in accordance with this order. If there is no practicable alternative to such remedial actions, unavoidable impacts to wetlands from these actions will be mitigated.	Relevant and Appropriate
State	Wetlands	MA Endangered Species Act (MESA) 321 CMR 10.00	Prohibits the "taking" of any rare plants or animals listed as Endangered, Threatened, or Special Concern by the MA Division of Fisheries and Wildlife. This also protects designated endangered/threatened species populations.	No state-listed endangered species have been identified in the vicinity of the Buoy Depot. However, appropriate measures must be taken during monitoring events and any future actions to ensure that state-listed threatened species (northern harrier) and state-listed species of special concern (spotted turtle and eastern box turtle) and their habitat are not adversely affected by any remedial actions. Although these species have not been identified onsite, they have been identified within the extent of the adjacent Navy base. Other listed migratory species may also pass through this area.	Relevant and Appropriate

**APPENDIX B Continued**

<b>ACTION SPECIFIC</b>					
<b>Authority</b>	<b>Applicability</b>	<b>ARAR</b>	<b>Requirement Synopsis</b>	<b>Action to be taken to attain ARAR</b>	<b>Status</b>
Federal	Soil	Resource Conservation and Recovery Act (RCRA) - Generator Requirements for Manifesting Waste for Offsite Disposal (40 CFR 262)	Standards for manifesting, marking, and recording hazardous waste shipments for offsite treatment/disposal.	If the monitoring events require offsite treatment/disposal of hazardous wastes (investigation-derived), then generator requirements will be followed.	Applicable
Federal	Soil	RCRA - Subpart I, Use and Management of Containers (40 CFR 264, Subpart I)	Outlines use and management standards applicable to owners and operators of all hazardous waste facilities that store containers of hazardous waste.	If monitoring events require storage of hazardous waste (investigation-derived) in containers, then the substantive requirements of these regulations will be followed.	Applicable
Federal	Soil	RCRA - Identification and Listing of Hazardous Wastes, Toxicity Characteristic (40 CFR 261.24)	These requirements identify the maximum concentrations of contaminants for which a waste would be considered a RCRA characteristic waste due to toxicity. The analytical test specified in Appendix II of 40 CFR 61 is referred to as the Toxic Characteristic Leaching Procedure (TCLP).	Investigation-derived waste will be analyzed by the TCLP to determine whether it is characteristic hazardous waste under RCRA. Wastes that are determined to exceed TCLP allowable concentrations (and are therefore hazardous) will be disposed of offsite in a RCRA Subtitle C or state equivalent treatment, storage, or disposal facility (TSDF). Wastes that are determined to be below TCLP allowable concentrations (and therefore non-hazardous) will be disposed of offsite in a RCRA Subtitle D or state equivalent TSDF.	Applicable
Federal	Soil	RCRA Standards Applicable to Generators of Hazardous Waste (40 CFR 262)	Massachusetts has been delegated the authority to administer these RCRA standards through its state hazardous waste management regulations. The relevant and appropriate provisions of 40 CFR 262 are incorporated by reference.	Investigation-derived waste may be characterized as hazardous waste. If so, the material will be handled in compliance with the substantive requirements of these standards.	Applicable

**APPENDIX B Continued**

<b>ACTION SPECIFIC (Continued)</b>					
<b>Authority</b>	<b>Applicability</b>	<b>ARAR</b>	<b>Requirement Synopsis</b>	<b>Action to be taken to attain ARAR</b>	<b>Status</b>
Federal	Soil	EPA Office of Solid Waste and Emergency Response (OSWER) Publication 9345.3-03 FS (January 1992)	Management of wastes generated during remedial activities must ensure protection of human health and the environment.	Investigation-derived wastes would be managed in accordance with these requirements.	To Be Considered
State	Soil	Hazardous Waste Management Rules; Requirements for Generators; 310 CMR 30.300	These regulations contain requirements for generators of hazardous waste. The regulations apply to generators of sampling waste and also apply to the accumulation of waste prior to offsite disposal.	Investigation-derived wastes that are determined to be hazardous would be managed in accordance with the substantive requirements of these regulations.	Applicable
State	Soil	Hazardous Waste Management Rules; Use and Management of Containers; 310 CMR 30.689	These regulations establish requirements for the use and management of containers at hazardous waste facilities.	If monitoring events require storage of hazardous waste (investigation-derived) in containers, then management procedure requirements will be followed.	Applicable

APPENDIX C  
MONITORING EVENT 07 (2012)  
ANALYTICAL RESULTS

**SWALE SURFACE SOIL SAMPLING RESULTS – ME-07**

Analyte Detected (mg/kg)	LTM- SSS- 01	LTM- SSS- 02	LTM- SSS- 03	LTM- SSS- 04	LTM- SSS- 05	LTM- SSS- 06	PAL <sup>(a)</sup>
Arsenic	<3.51	<3.33	<4.82	<4.18	<5.47	<2.60	56
Chromium	<b>39.3</b>	<b>28.5</b>	<b>37.2</b>	<b>37.6</b>	<b>37.4</b>	6.1	16
Copper	<b>2,520J</b>	<b>1,600J</b>	<b>2,600J</b>	<b>2,230J</b>	<b>2,440J</b>	203J	1,020
Lead	<b>419J</b>	<b>339J</b>	<b>495J</b>	<b>481J</b>	<b>496J</b>	49.6J	302
Nickel	31.4	22.1	33.6	30.5	33.1	4.8	230
Zinc	<b>762J</b>	<b>535J</b>	<b>876J</b>	707J	<b>823J</b>	120J	738

(a) PAL per Final QAPP Table 1-3.  
Numbers in bold indicate values above the PAL.  
J = estimated concentration

**WETLAND HYDRIC SOIL SAMPLING RESULTS – ME-07**

Analyte Detected (mg/kg)	LTM- WSS- 01	LTM- WSS- 02	LTM- WSS- 03	LTM- WSS- 04	LTM- WSS- 05	LTM- WSS- 06	PAL <sup>(a)</sup>
Arsenic	<4.34	<3.87	<3.38	<2.74	<3.83	<5.49	56
Chromium	<b>22.1</b>	<b>17.9</b>	12.1	8.0	<b>19.2</b>	<b>27.8</b>	16
Copper	<b>1,150J</b>	792J	432J	284J	598J	932J	1,020
Lead	291J	238J	129J	70J	<b>584J</b>	<b>433J</b>	302
Nickel	15.6	11.7	9.3	6.0	12.1	15.1	230
Zinc	<b>392J</b>	217J	181J	124J	260J	249J	738

(a) PAL per Final QAPP Table 1-3.  
Numbers in bold indicate values above the PAL.  
J = estimated concentration

**APPENDIX D  
MONITORING EVENT 08 (2013)  
ANALYTICAL RESULTS**

**Swale Surface Soil Sampling Results – Me-08**

Analyte Detected (mg/kg)	ME08-SSS-01	LTM-SSS-01	ME08-SSS-02	LTM-SSS-02	LTM-SSS-03	ME08-SSS-03	LTM-SSS-04	ME08-SSS-04	LTM-SSS-05	ME08-SSS-05	LTM-SSS-06	RG <sup>(a)</sup>
Arsenic	<9.31	<8.65	<6.74	<10.6	<11.3	<11.8	<8.87	<9.98	<16.0	<5.75	<5.29	56
Chromium	<b>32.7</b>	<b>30.1</b>	15.7	<b>29.8</b>	<b>24.1</b>	<b>39.6</b>	<b>34.9</b>	<b>27.8</b>	<b>45.4</b>	12.4	6.8	16
Copper	<b>2,100</b>	<b>2,000</b>	877	<b>1,670</b>	<b>1,060</b>	<b>2,470</b>	<b>1,900</b>	<b>1,410</b>	<b>3,060</b>	662	165	1,020
Lead	<b>551J</b>	<b>395J</b>	229J	<b>454J</b>	<b>438J</b>	<b>517J</b>	<b>438J</b>	<b>417J</b>	<b>627J</b>	160J	45.2J	302
Nickel	25.8	24.9	12.2	23.2	16.0	32.7	27.6	20.6	38.3	11.0	6.6	230
Zinc	662J	616J	312J	614J	380J	<b>778J</b>	613J	523J	<b>922J</b>	233J	92.6J	738

(a) Remedial Goal (RG) for the Swale per Final LTMP Table 2.  
Numbers in bold indicate values above the RG for the Swale.  
J = estimated concentration

**Wetland Hydric Soil Sampling Results – Me-08**

Analyte Detected (mg/kg)	LTM-WSS-01	LTM-WSS-02	LTM-WSS-03	LTM-WSS-04	LTM-WSS-05	LTM-WSS-06	RG <sup>(a)</sup>
Arsenic	<12.6	<11.8	<6.79	<6.59	<9.76	<19.8	100
Chromium	<b>17.1</b>	<b>21.8</b>	4.8	6.8	<b>18.1</b>	<b>27.4J</b>	17
Copper	773	600	76.8	126	615	1,240J	1,950
Lead	248J	<b>621J</b>	33.8J	40.8J	239J	<b>502J</b>	302
Nickel	13.8	7.1	3.6	5.7	12.8	18.7J	245
Zinc	267J	101J	54.8J	72.8J	252J	376J	1,050

(a) Remedial Goal (RG) for the Wetland per Final LTMP Table 2.  
Numbers in bold indicate values above the RG for the Wetland.  
J = estimated concentration

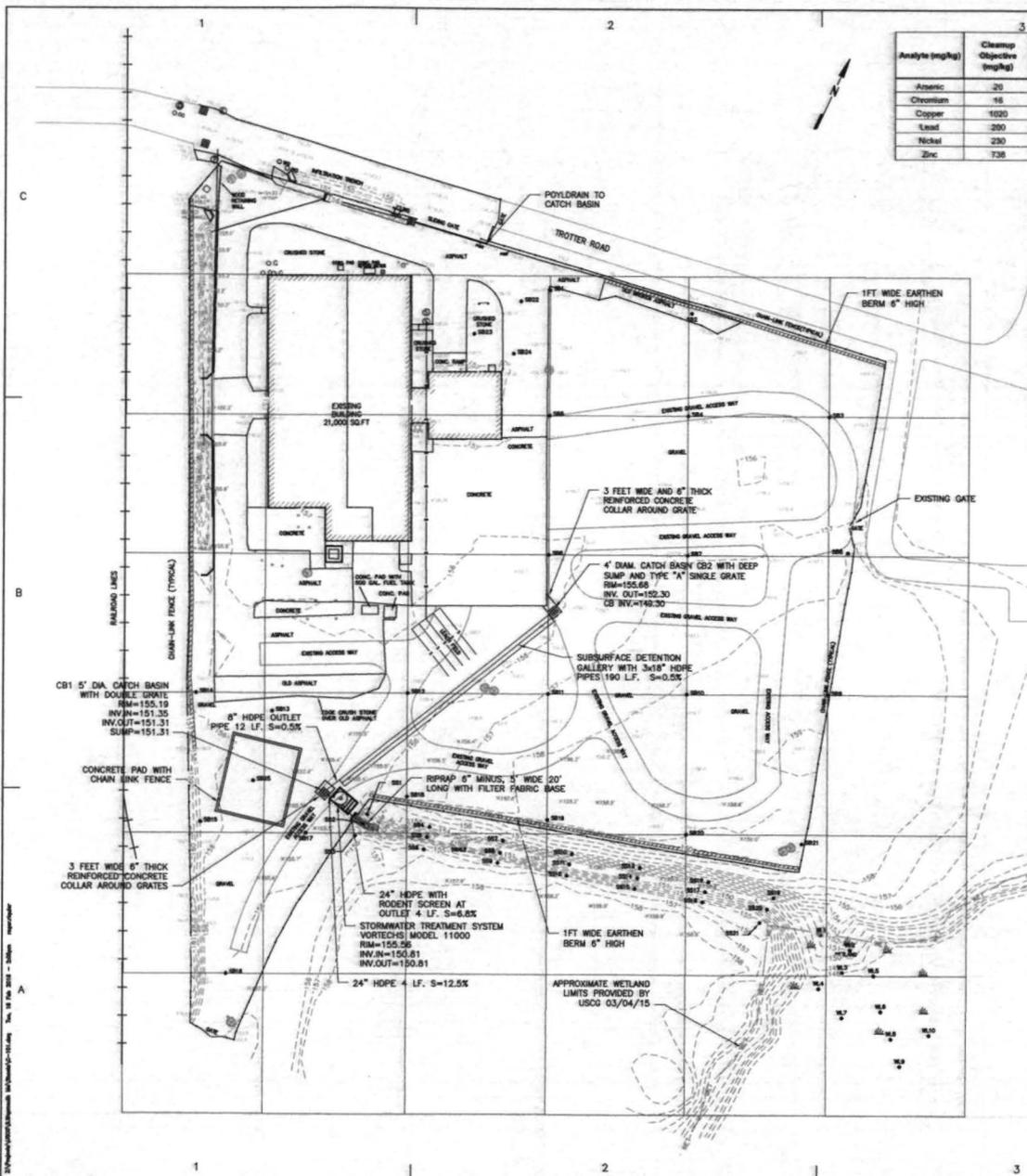
APPENDIX E  
MONITORING EVENT 09 (2014)  
ANALYTICAL RESULTS

**Swale Surface Soil Sampling Results – ME-09**

Analyte Detected (mg/kg)	LTM-SSS-01	LTM-SSS-02	LTM-SSS-03	LTM-SSS-04	LTM-SSS-05	LTM-SSS-06	RG <sup>(a)</sup>
Arsenic	10.1	6.17	9.44	8.81	9.44	2.09	56
Chromium	<b>39.3 J</b>	<b>26.1 J</b>	<b>38.1 J</b>	<b>36.1 J</b>	<b>37.4 J</b>	7.1 J	16
Copper	<b>3110</b>	<b>1520</b>	<b>2340</b>	<b>2550</b>	<b>2210</b>	188	1,020
Lead	<b>495</b>	<b>326</b>	<b>461</b>	<b>443</b>	<b>436</b>	37.6	302
Nickel	32.3	18.9	28.3	28.8	28.9	5.6	230
Zinc	694	447	671	627	593	92.3	738
(a) Remedial Goal (RG) for the Swale per Final LTMP Table 2. Numbers in <b>bold</b> indicate values above the RG for the Swale. J = estimated concentration							

**Wetland Hydric Soil Sampling Results – ME-09**

Analyte Detected (mg/kg)	LTM-WSS-01	LTM-WSS-02	LTM-WSS-03	LTM-WSS-04	LTM-WSS-05	LTM-WSS-06	RG <sup>(a)</sup>
Arsenic	4.45	<2.06	<2.46	<2.02	4.23	4.18	100
Chromium	14.9 J	5.8 J	7.5 J	5.2 J	14.7 J	<b>19.8 J</b>	17
Copper	904	70.4	131	95.9	599	621	1,950
Lead	228	28.2	35.9	25.3	174	<b>338</b>	302
Nickel	11.1	4.8	6.1	4.3	11.8	11.7	245
Zinc	257	49.8	75.5	58.3	225	185	1,050
(a) Remedial Goal (RG) for the Wetland per Final LTMP Table 2. Numbers in <b>bold</b> indicate values above the RG for the Wetland. J = estimated concentration							



Analyte (mg/kg)	Cleanup Objective (mg/kg)
Arsenic	30
Chromium	15
Copper	1000
Lead	200
Nickel	230
Zinc	738

Sample ID	Sample Depth (in)	XRF Average Lead Result (mg/kg)	Lab Analysis Lead (SW8150) Result (mg/kg)	Lab Analysis Arsenic Result (mg/kg)	Lab Analysis Chromium Result (mg/kg)	Lab Analysis Copper Result (mg/kg)	Lab Analysis Nickel Result (mg/kg)	Lab Analysis Zinc Result (mg/kg)
SB-02-13T004	134	415	358	122	1300	97.3	454	
SB-03-07T06	202	211	434	29.7	323	19.2	134	
SB-09-07T06	321	237	3.92	25	305	15.2	93.5	
SB-07-07T06	755	792	10.1	99.3	757	89	157	
SB-07-07T02	309							
SB-08-07T06	161	197	5.34	38.8	270	26.9	112	
SB-10-07T06	377	287	6.73	27.4	598	24.7	142	
SB-11-07T06	252	190	5.35	25.8	501	18.8	194	
SB-12-07T06	386	321	4.08	18.2	304	12.6	126	
SB-12-07T02	711							
SB-13-07T06	484							
SB-14-07T06	455							
SB-14-07T02	419	364	2.77	14.7	323	8.66	83.4	
SB-14-13T004	293							
SB-16-07T06	297							
SB-16-12T004	249	263	4.39	19.4	257	10.4	90.6	
SB-17-07T06	260							
SB-17-07T02	625	357	8.19	31.7	195	13.6	91	
SB-21-07T06	321	225	5.80	19.4	483	14.7	64.2	
SS-01-07T06	386							
SS-01-07T02	862	845	4.96	29.8	493	10.3	119	
SS-02-07T06	479							
SS-02-07T02	555	581	11.1	47.8	2040	32.2	686	
SS-05-07T06	283	229	4.7	13.5	535	9.03	191	
SS-09-07T06	312	362	6.74	24	1180	16.5	391	
SS-14-07T06	326	305	7.19	22.7	1890	17.4	385	
WL-01-07T06	216							
WL-02-07T06	328							
WL-02-07T02	263	138	4.87	15.4	270	9.24	153	
WL-04-07T06	1782							
WL-04-07T02	760	690	9.4	33	1540	14.7	236	
WL-06-07T06	305	409	7.4	26.9	993	16.8	360	
WL-07-07T06	229							
WL-09-07T06	355	416	7.07	18.6	561	15.3	301	

- NOTES:**
- BOLD FONT AND SHADED CELLS INDICATE EXCEEDANCES OF CLEANUP OBJECTIVES.
  - NOT ALL CHARACTERIZATION SAMPLE DATA SHOWN; ONLY SAMPLE LOCATIONS AND DEPTH WITH EXCEEDANCE ARE SHOWN ABOVE.

CONSULTANTS

amec foster wheeler  
 Environment & Infrastructure, Inc.  
 311 Congress Street, Suite 200  
 Providence, MA 01102  
 (603) 775-5401

U. S. COAST GUARD  
 CIVIL ENGINEERING UNIT  
 PROVIDENCE

USCG, CEU PROVIDENCE  
 475 KILVERT STREET, SUITE 100  
 WARWICK, RI 02886

ISSUE	DATE	DESCRIPTION
E	02/18/18	100% DESIGN CORRECT TABLE
D	05/09/15	100% DESIGN
C	04/17/15	DRAFT 100% DESIGN
B	03/13/15	85% DESIGN SUBMITTAL
A	12/09/14	35% DESIGN SUBMITTAL

A/E PROJECT NO:	338000033
CAD FILE NAME:	C-101
DESIGNED BY:	JOP
DRAWN BY:	RJR
TEXTED BY:	JOP
CHECKED BY:	MAP
APPROVED BY:	PSB
SCALE:	AS SHOWN
PLOT SCALE:	1:1

**SHEET TITLE**

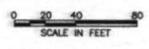
SITE REMEDIATION  
 CG IPD SOUTH WEYMOUTH  
 SOUTH WEYMOUTH MA  
 BUOY MAINTENANCE FACILITY  
 CIVIL  
 EXISTING CONDITIONS

REVIEWED BY:	REVIEWED BY:	REVIEWED BY:
M. ANDREWS	R. MARINO	A. A. JACOBS
PROJECT ENG.	BRANCH CHIEF	TECH. DIRECTOR

ALFRED A. JACOBS JR., PE  
 APPROVING OFFICER DATE

PROJECT NUMBER	DRAWING NUMBER
581802	P581802
DISCIPLINE/SHEET NO	SHEET 3 OF 9
C-101	

APPENDIX F



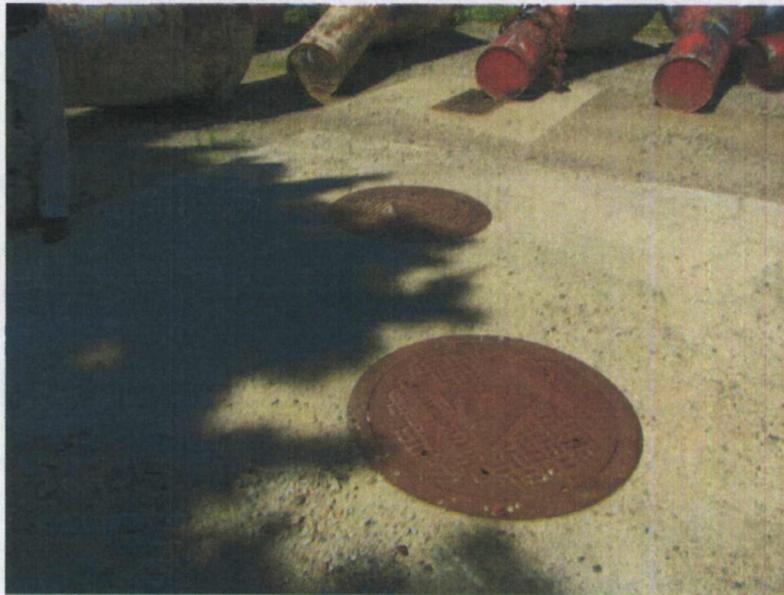
**APPENDIX G  
SURFACE WATER ANALYTICAL RESULTS  
MONITORING EVENT 09 (2014)**

**Surface Water Sampling Results – ME-09**

Analyte Detected (µg/L)	SW-01 (total)	SW-01 (dissolved)	SW-02 (total)	SW-02 (dissolved)	SW-03 (total)	SW-03 (dissolved)	PAL <sup>(a)</sup>
Arsenic	<5	<2.5	<5	<2.5	<5	<2.5	150
Chromium	<10	<10	<10	<10	15.4	<10	11
Copper	<b>553</b>	<b>334</b>	<b>592</b>	<b>338</b>	<b>2,230</b>	<b>913</b>	9
Lead	<b>89.5</b>	<b>64.2</b>	<b>96.6</b>	<b>70.8</b>	<b>226</b>	<b>97.9</b>	2.5
Nickel	<25	<25	<25	<25	<25	<25	52
Zinc	<b>235</b>	<b>205</b>	<b>244</b>	<b>175</b>	<b>705</b>	<b>342</b>	120
(a) PAL = EPA Chronic Water Quality Criteria. Numbers in bold indicate values above PAL.							

**APPENDIX H**

**5-YEAR REVIEW SITE INSPECTION PHOTOGRAPHS  
JULY 06, 2016**



**Photograph 1: Vortech System Manhole Covers**



**Photograph 2: Buoy Storage Area (Phase I Excavation Area) Prior to Remediation**



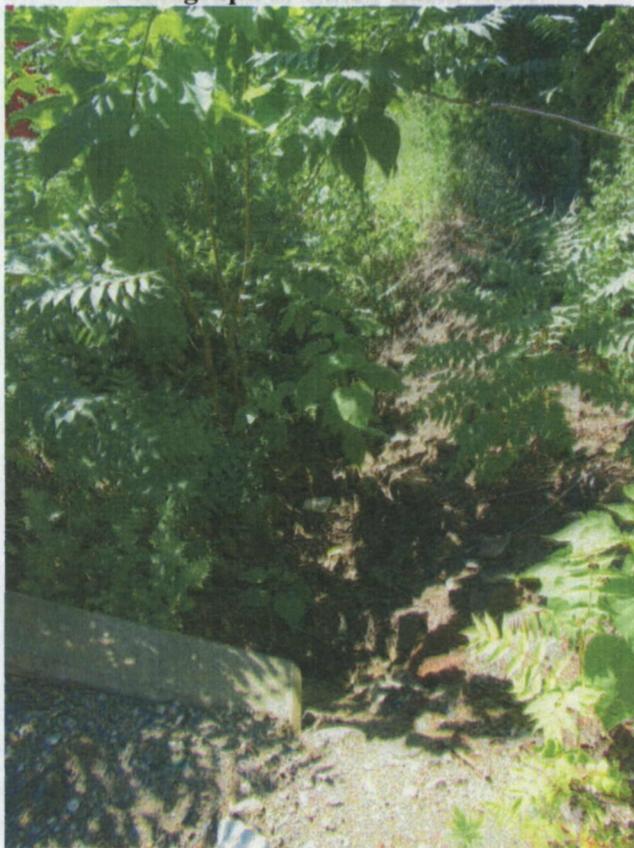
**Photograph 3: Catch Basin CB-2**



**Photograph 4: Polydrain at Facility Entrance from Catch Basin CB-3**



**Photograph 5: Catch Basin CB-4**



**Photograph 6: Infiltration Trench**



**Photograph 7: Catch Basin CB-1**

**APPENDIX I**  
**RESPONSES TO EPA AND MASSDEP COMMENTS ON**  
**THE DRAFT SECOND FIVE YEAR REVIEW REPORT FOR**  
**U.S. COAST GUARD IPDSW SITE, SOUTH WEYMOUTH, MA**

EPA COMMENTS – Received via email from Mr. Matthew Audet on 12/19/2016 and 12/21/2016.

1. Section 7: The 5yr Review should reflect the successful completion of the 2016 Removal Action. Please revise the answers and discussion to questions A, B, & C to be Yes, Yes, No.

*USCG Response – Comment noted. Section 7 has been revised accordingly.*

2. Section 9: Based on the 2016 Removal Action and the resultant meeting of RAOs, there should be no Issues. Please revise this section to state that.

*USCG Response – Comment noted. Section 9 has been revised accordingly.*

3. Based on the 2016 Removal Action and the resultant meeting of RAOs, there should be no Recommendations and Follow-up Actions. Please revise this section to state that.

*USCG Response – Comment noted. Section 10 has been revised accordingly.*

4. Please revise this section to reflect Exhibit 4-7 of EPA's 5yr Review Guidance: "Because the remedial actions at USCG Buoy Depot (OU10) are protective, the site is protective of human health and the environment."

*USCG Response – Comment noted. Section 11 has been revised accordingly.*

5. Based on the Sept 13, 2012 clarifying memo, describe what elements of the remedy that protect human health and the environments and how the RAOs have been met or are being met. Also, the protectiveness statement should be written that states that "The remedy at OU10 is protective of human health and the environment".

*USCG Response – Comment noted. Section 4.6 and the Protectiveness Statement have been updated accordingly.*

6. On page vi, the actual goals should be UU/UE (unlimited use/unrestricted exposure).

*USCG Response – Comment noted. Page vi has been updated.*

7. On page 12-1 under Next Review, it states that once the site is delisted ( should actually state deleted) from the NPL, then five-year reviews are not required. This is not true. Because a site is deleted, five-year reviews can continue. The only time a five-year review ends is when the OU has reached UU/UE.

*USCG Response – Comment noted.*

MASSDEP Comments – Received via email from Mr. David Chaffin on 12/16/2016

1. Executive Summary: Cleanup goals for the on-going removal action were selected to reduce risk sufficiently to allow unrestricted use, rather than residential use in particular. In addition, the meaning of “residential use” is vague and the USCG has no plans to utilize the site property for residential use. Consequently, MassDEP recommends that all references to “residential standards” and “residential cleanup standards” be deleted from the report and replaced with terms such as “unrestricted use” or “unlimited use and unrestricted exposure”. Also, where appropriate, the report should note that the cleanup goals for the swale and wetland areas were also selected to eliminate unacceptable risks to environmental receptors.

*USCG Response – Comment noted. The report has been updated accordingly.*

2. Executive Summary and Section 11.0, Protectiveness Statement: The protectiveness statement does not conform to the FYR guidance (EPA, 2001). If the USCG intends to assess protectiveness based on the performance of the 2006 remedy, then the “not protective” statement provided in Exhibit 4-6 of the guidance appears to be appropriate. If the USCG intends to assess protectiveness based on the expected outcome of the on-going removal action, which is expected to allow unrestricted use and eliminate unacceptable risks to environmental receptors when complete, then the “protective or expected to be protective” statement in Exhibit 4-6 of the FYR guidance appears to be appropriate. Also refer to Clarifying the Use of Protectiveness Determinations for CERCLA Five-Year Reviews, September 2012, OSWER 9200.2-111.

*USCG Response – Comment noted. The Executive Summary and Section 11 have been revised accordingly.*

3. Section 3.3, Final Sentence: Replace “most” with “all”? Section 4.6.7 indicates that the USCG removed all buoys coated with LBP from service.

*USCG Response – Comment noted. Section 3.3 has been revised accordingly.*

4. Section 3.4: To avoid reader confusion, text concerning past site conditions should be described using past tense (e.g., “remained” rather than “remain” and “reduced” rather than “will reduce”).

*USCG Response – Comment noted. Section 3.4 has been revised accordingly.*

5. Section 4.6: Here and elsewhere in the report, please confirm/correct the document citations associated with the Sampling and Analysis Plan (Tantara, 2016c rather than Tantara, 2016b?) and Quality Assurance Project Plan (Tantara, 2016d rather than Tantara, 2016c?).

*USCG Response – Comment noted. The document references in the text have been corrected to be consistent with Section 13 (References). The SAP is identified as “Tantara 2016c” and the QAPP is identified as “Tantara 2016d” in the document.*

6. Section 4.6, Final Paragraph: In addition to the main components of the removal action outlined in preceding paragraphs, the report should note that the removal action will address exposed shallow soil in seven of nine relatively small unpaved areas located immediately adjacent to the IPDSW building.

*USCG Response – Comment noted. Section 4.6 has been updated to indicate that the 2016 removal action includes the remediation of soils in unpaved areas adjacent to the IPDSW building.*

7. Section 6.0, First Sentence: Replace “first” with “second”?

*USCG Response – Comment noted. Section 6.0 has been revised accordingly.*

8. Section 6.7, Second Sentence: Replace “first” with “second”?

*USCG Response – Comment noted. Section 6.7 has been revised accordingly.*

9. Section 7.1: The report should provide an explicit answer to Question A. If the USCG intends to assess protectiveness based on the performance of the 2006 remedy, the answer to Question A should be “No”. If the USCG intends to assess protectiveness based on the expected outcome of the on-going removal action, the answer to Question A could be “Yes”. Section 7.1 should include text explaining the position taken and provide supporting information.

*USCG Response – Comment noted. Section 7.1 has been revised. The answer to question A has been changed to, “YES” based on this comment and EPA Comment No. 1.*

10. Section 7.2: The report should provide an explicit answer to Question B. Based on the information presented here, the answer to Question B appears to be “Yes”.

*USCG Response – Comment noted. Section 7.2 has been revised. The answer to question B has been changed to, “YES” based on this comment and EPA Comment No. 1.*

11. Section 7.3: The report should provide an explicit answer to Question C. If the USCG intends to assess protectiveness based on the performance of the 2006 remedy, the answer to Question C should be “Yes”. If the USCG intends to assess protectiveness based on the expected outcome of the on-going removal action, the answer to Question C could be “No”. Section 7.3 should include text explaining the position taken and provide supporting information.

*USCG Response – Comment noted. Section 7.3 has been revised. The answer to question C has been changed to, “NO” based on this comment and EPA Comment No. 1.*

12. Table 1, Final Row: Replace “III” with “IV”?

*USCG Response – Comment noted. Table 1 has been revised accordingly.*

13. Appendix A: The report should include a copy of the entire FYR Notice.

*USCG Response – Comment noted. The FYR public notice has been re-scanned and attached to provide the entire published text.*