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September 30, 2019

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Ref: Environmental Remedial Action Contract (RAC VII)
Contract N62470-16-D-9004, Task Order N4008518F6147

Subj: Transmittal, Draft Final Remedial Action Work Plan,
Site 1 - Former Drum Marshalling Area, NWIRP Bethpage

Dear Mr. Murray:

Enclosed is the Final Remedial Action Work Plan for the Site 1 – Former Drum Marshalling Area, NWIRP Bethpage located in Bethpage, New York. This submittal includes the Remedial Action Work Plan, Project Schedule, Project Quality Control Plan, Environmental Protection Plan, and Waste Management Plan. Should you have any questions or comments, please do not hesitate to contact me at your convenience.

Sincerely,

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FINAL
REMEDIAL ACTION WORK PLAN
Site 1 – Former Drum Marshalling Area
Naval Weapons Industrial Reserve Plant
Bethpage, New York

Contract Number: N62470-16-D-9004
Contract Task Order: N4008518F6147

Document Control Number: APTIM-9004-F6147-0001

September 2019

Submitted to:

NAVFAC Mid-Atlantic
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FINAL
REMEDIAL ACTION WORK PLAN
Site 1 – Former Drum Marshalling Area
Naval Weapons Industrial Reserve Plant
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Contract Number: N62470-16-D-9004
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September 2019

Prepared by: _____ Date: September 30, 2019
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William L. Deane, Jr., P.E.
Program Manager

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Acronyms and Abbreviations

%	percent
°F	degrees Fahrenheit
ac.	acres
APP	Accident Prevention Plan
APTIM	Aptim Federal Services, LLC
ASTM	American Society for Testing Materials
bgs	Below Ground Surface
CCR	Construction Completion Report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Coder of Federal Regulations
COC	Contaminants of Concern
CY	cubic yard
E&S	Erosion and Sediment
EPP	Environmental Protection Plan
ER	Environmental Restoration
ESCP	E&S Control Plan
ft^3	cubic feet
ft.	feet
gal	gallon
GCL	Geosynthetic Clay Liner
in.	inches
in^2	square inch
kg	kilogram
lb	pounds
LF	linear feet
mg	milligram
mm	millimeter
msl	Mean Sea Level
NAVFAC	Naval Facilities Engineering Command
Navy	U.S. Department of the Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPS	nominal pipe size
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration

Acronyms and Abbreviations Continued

OU	Operable Unit
oz.	ounce
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PQCP	Project Quality Control Plan
PVC	Polyvinyl Chloride
QAPP	Quality Assurance Project Plans
QC	Quality Control
RAWP	Remedial Action Work Plan
RCP	Reinforced Concrete Pipe
RLS	Registered Land Surveyor
ROD	Record of Decision
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act of 1986
SF	square feet
SSHO	Site Safety and Health Officer
SVOC	Semi-Volatile Organic Compound
SWPPP	Stormwater Pollution Prevention Plan
TAGM	Technical and Administrative Guidance Memorandum
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TCP	Traffic Control Plan
UFGS	Unified Facilities Guide Specifications
USACE	U.S. Army Corps of Engineers
USC	United States Code
USEPA	U.S. Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WMP	Waste Management Plan
yd^2	square yard

1.0 Introduction

This Remedial Action Work Plan (RAWP) presents the specific tasks and procedures that will be implemented by Aptim Federal Services, LLC (APTIM) during the remedial action for Site 1 at Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage in Bethpage, New York. The remedial action is being performed for the U.S. Department of the Navy (Navy) Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic, under Contract No. N62470-16-D-9004, Contract Task Order N4008518F6147. This work is being performed under the Navy Environmental Restoration (ER) Program.

This work will be executed to fulfill the requirements outlined in the Operable Unit (OU) 4 Record of Decision (ROD) (Navy, 2018) by completion of the remedial action in accordance with the Final Remedial Design (Tetra Tech, 2019), the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The work at Site 1 shall be executed to fulfill the requirements of the OU4 ROD (Navy, 2018). The 2018 OU4 ROD selected remedy includes excavation and either on-site reuse or off-site disposal of polychlorinated biphenyl (PCB)-contaminated soils and installation of a reduced permeability cover. The cover will reduce leaching of contaminants from unsaturated soil to groundwater.

1.1 Project Summary Scope of Work

The objective of the selected remedy outlined in the OU4 ROD is to excavate and dispose of PCB-contaminated soils and install a reduced permeability cover. The cover will reduce leaching of contaminants from unsaturated soil to groundwater. Prior to intrusive activities, a truck scale, decontamination pad, and sheet piling will be installed to assist in safely implementing the selected remedy.

APTIM and its subcontractors will implement the selected remedy by conducting a limited excavation to remove PCB-contaminated soil as follows:

- Concentrations greater than one-milligram/kilogram (mg/kg) to a depth of two-feet (ft.) below ground surface (bgs);
- Concentrations greater than 10-mg/kg to a depth of 10-ft. bgs;

- Concentrations greater than 50-mg/kg to a depth of 20-ft. bgs at Site 1; and
- Concentrations greater than 50 mg-kg to a depth of 30-ft. bgs at Dry Well 20-08.

Clean, overburden soils with less than 10 mg/kg PCBs (to a depth of 10-ft.) or 50 mg/kg (at depths over 10-ft.) will be reused as backfill and/or consolidated on-site.

The selected remedy also includes installation of a reduced permeability cover (geosynthetic clay liner [GCL]) in areas requiring excavation to a depth of or greater than 20-ft. bgs. Upon completion of the excavation and GCL installation, all disturbed areas will be restored to include re-grading and re-vegetation, as appropriate for planned future use. APTIM will be responsible for the characterization, transportation, and disposal of generated, contaminated material. This work will be performed in compliance with federal, state, and local regulations as they pertain to the environment.

Final approval of this RAWP is required by NAVFAC Mid-Atlantic and the New York State Department of Environmental Conservation (NYSDEC).

1.2 Work Plan Organization

This RAWP consists of the following sections and provides descriptions of the specific activities involved in the implementation of the remedial action. This RAWP is organized as follows:

- **Section 1.0, Introduction**—Section 1.0 provides an introduction, project organization, Work Plan organization, and site safety.
- **Section 2.0, Site Conditions and Background**—Section 2.0 presents the site location, description, history, and site chemical characteristics.
- **Section 3.0, Regulatory Framework**—Section 3.0 describes the regulatory process, Remedial Action Objectives, and anticipated waste streams.
- **Section 4.0, Project Requirements**—Section 4.0 describes the required supporting project documents.
- **Section 5.0, Pre-Construction Activities**—Section 5.0 describes the pre-construction activities, mobilization, site preparation, utility relocation, and site safety and security.
- **Section 6.0, Remedy Implementation**—Section 6.0 describes the all associated construction activities; installation of sheet piling, waste characterization sampling, excavation, installation of the GCL, transportation and disposal of soil and debris, backfilling, and site restoration.
- **Section 7.0, Project Management Plan**—Section 7.0 presents the project responsibilities, data management, document control, and meetings and reports.

- **Section 8.0, Reporting Requirements**—Section 8.0 describes the reporting requirements including a comprehensive Construction Completion Report (CCR).
- **Section 9.0, References**—Section 9.0 includes a list of documents used to compile this RAWP.
- **Appendix A, Project Schedule**
- **Appendix B, Project Specifications and Design Drawings**
- **Appendix C, Project Quality Control (QC) Plan (PQCP)**
- **Appendix D, Environmental Protection Plan (EPP)**
- **Appendix E, Waste Management Plan (WMP)**
- **Appendix F, Response to Comments**

1.3 Site Safety

Occupational Safety and Health Administration (OSHA) excavation regulations and notification requirements will be followed. Excavations will be conducted in accordance with the U.S. Army Corps of Engineers (USACE) *Safety and Health Requirements Manual EM 385-1-1* (2014), and the *Unified Facilities Guide Specifications (UFGS) Section 01 35 26 Governmental Safety Requirements* (NAVFAC, 2012).

Field activities will be conducted in accordance with the *Accident Prevention Plan (APP), Site 1 – Former Drum Marshalling Area Remedial Action for Contaminated Soil, Naval Weapons Industrial Reserve Plant, Bethpage, New York* (APTIM, 2018a).

1.4 Supporting Documents

Supporting documents in addition to this RAWP include the Sampling and Analysis Plan (SAP), Traffic Control Plan (TCP), and Stormwater Pollution Prevention Plan (SWPPP). The supporting documents are provided in conjunction with this RAWP to provide further details regarding sampling analysis/methods, traffic procedures, and stormwater protection measures to be implemented throughout the project duration. Additional details regarding these supporting documents are provided in Section 4.0.

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2.0 Site Conditions and Background

This section presents a general description of the site, the history, topography and site features, climate, geology, hydrogeology, hydrology, and contaminants of concern (COCs).

2.1 Site Location

The former NWIRP Bethpage is located in east-central Nassau County, Long Island, New York, approximately 30-miles east of New York City (Figure 1). NWIRP Bethpage is bordered on the north, west, and south by property owned, or formerly owned, by Northrop Grumman that covered approximately 500-acres (ac.), and, on the east, by a residential neighborhood (Figure 2).

Site 1 is situated along the eastern boundary of the former NWIRP Bethpage and is a relatively flat area with a four-ft. vegetated windrow located along the eastern end of the site and is mounded on the north by a partially buried abandoned sanitary settling tank.

The Site is enclosed by a facility perimeter fence along the north, east, and south and an interior facility fence along the west. The interior fence was installed in 1998 as an interim measure to restrict facility personnel from areas with residual soil contamination. The area bounded by this fence is lightly vegetated and the remainder of Site 1 is covered with concrete or gravel. Dry Well 20-08 is located outside of the fenced area but is underneath the interim soil cover that was placed over PCB-contaminated soil in 1993. The existing conditions at Site 1 is provided on Drawing C-100 of the Design Drawings (Appendix B).

The land surrounding the nine-ac Bethpage facility in all directions is primarily industrial and residential. Operations at the Site 1 are currently limited to soil vapor control, control of vegetation, and fence repair. Security is provided by Steel Equities.

2.2 Site Description and History

The former NWIRP Bethpage was located adjacent to the Grumman facility, and was operated by Grumman and later Northrop Grumman from 1942 to the mid-1990s. The plant's primary mission was the research prototyping, testing, design engineering, fabrication, and primary assembly of military aircraft. In 1996, operations ended at the facility. At that time, the NWIRP was approximately 109.5-ac. in size. In 2002, 4.5-ac. of the property were transferred to Nassau County. In February 2008, the Navy transferred an additional 96-ac. of the remaining 105-ac. main parcel to Nassau County. The remaining nine-ac. parcel is being retained by the Navy for environmental investigation and remediation.

From the early 1950's to 1978, drums containing liquid wastes were stored on a cinder-covered area over a cesspool leach field. This leach field may have been used to discharge process wastewater. In 1978, the drum storage area was moved a few yards to the south to a 100- by 100-ft. concrete pad. In 1982, the drum storage area was moved to its present location at Site 3. Transformers and PCB-filled autoclaves were also stored at the site. The waste drums reportedly contained chlorinated and non-chlorinated solvents, and liquid cadmium and chromium wastes. In addition, underlying most of Site 1 are approximately 120 abandoned cesspools that were designed to discharge sanitary wastewaters from Plant No. 3 that were in use from the early 1950s to 1978. These cesspools were approximately 10-ft. in diameter and 16-ft. deep. Based on field observations, the cesspools were filled with soil between 1978 and 1986. It is possible that non-sanitary wastes may have been discharged into this system. The drum marshalling areas and the leach field were the initial extent of Site 1.

The site was originally identified and investigated as part of the facility-wide investigations. A ROD for Site 1 soil was signed in 1995 to address PCB- and volatile organic compound (VOC) - contaminated soil. Residual soil contamination noted in the ROD consists of metals, VOC, polynuclear aromatic hydrocarbon (PAH), and PCBs at concentrations greater than protective levels listed in Technical and Administrative Guidance Memorandum (TAGM) 4046. Levels of these constituents also exceed the NYSDEC Part 375 Soil Cleanup Objectives, an Applicable or Relevant Appropriate Requirements promulgated in 2006. Groundwater contamination above the TAGM 4046 and Part 375 NYSDEC Cleanup Objectives consisting of metals, VOCs and PAHs was also noted in the ROD.

In June/July 2009, buildings, tanks, and concrete aprons within the fenced portion of Site 1 were demolished and disposed/recycled off-site.

In 2012, at the request of the property leases to allow additional parking for facility tenants and with concurrence from NYSDEC, the southern section of the Site 1 interior facility fence was moved to the north approximately 100 feet and the western section of the fence was moved to the east approximately 30 ft. This new access area was covered with gravel and asphalt in accordance with the OU1 ROD, (NYSDEC, 1995). In April 2012, the current property owner, Steel Equities, uncovered two intact Underground Storage Tanks (USTs) that were found to contain residual solvent material. The USTs and contents were removed in September 2012 and post-removal soil samples were collected. As of 2013, the area within the interior facility fence is lightly vegetated soil.

2.3 Topography and Site Features

The former NWIRP Bethpage is located on a relatively flat, featureless, glacial outwash plain (Resolution, 2016). The site and nearby vicinity are highly urbanized. Because of this, most of the natural physical features have been reshaped or destroyed. Elevations range from greater than 140-ft. above mean sea level (msl) in the north to less than 110-ft. above msl at the southwest corner.

2.4 Climate

The climate of NWIRP Bethpage is considered to be humid subtropical/continental and is moderated by its proximity to the Atlantic Ocean, the Long Island Sound, and Great South Bay. There are generally warm to hot and humid summers, and warm to cold winters. In Bethpage (Farmingdale, NY), the warmest and coldest months of the year are August (mean temperature of 78 degrees Fahrenheit [°F]) and February (mean temperature of 29°F), respectively. Annual precipitation averages 43.74-inches (in.) (usclimatedata, 2016).

2.5 Geology

The Upper Glacial Formation (commonly referred to as glacial deposits) forms the surface deposits across the entire NWIRP. The glacial deposits beneath the site consist of coarse sands and gravels. These deposits are generally about 40- to 45-ft. thick; local variations in thickness are more common due to the irregular and undulating contact of the glacial deposits with the underlying Magothy Formation. The contact between the two formations was defined as the horizon where gravel becomes rare to absent, and finer sands, silts, and clay predominate (Resolution, 2016).

2.6 Hydrogeology

The Upper Glacial Formation and the Magothy Formation comprise the aquifer of concern at the NWIRP. Regionally, these formations are generally considered to form a common, interconnected aquifer, as the coarse nature of each unit near their contact, and the lack of a confining clay unit, allows for the unrestricted flow of groundwater between formations.

The water table at the NWIRP occurs below the glacial deposits. The glacial deposits are highly permeable, allowing for rapid recharge of precipitation to the underlying Magothy Formation. In addition, large quantities of water withdrawn from the Magothy are recharged back to the Magothy aquifer from the Upper Glacial Formation via the recharge basins at the NWIRP (Resolution, 2016). The Magothy aquifer is a major source of public water for Nassau County.

2.7 Contaminants of Concern

COCs were identified in the 2018 OU4 ROD Draft (Navy, 2018). The ROD specifically addresses the following:

- PCBs, VOCs, semi-volatile organic compounds (SVOCs), metals (arsenic, chromium, and hexavalent chromium), and pesticides in soils from ground surface to 65-ft. bgs;
- Residual PCB-contaminated soil associated with Dry Well 20-08 which was added to Site 1 because of proximity and similarity in COC, concentrations, and depth;
- PCB- and metal (total chromium and hexavalent chromium)-contaminated on NWIRP groundwater associated with Site 1, which was not addressed in the 1995 OU 1 ROD or the 2003 OU 2 ROD (NYSDEC, 1995);
- VOCs in Site 1 soil vapor that could result in vapor intrusion. The 1995 ROD did not address soil vapor intrusion as a pathway (NYSDEC, 1995).

These contaminated media represent potential threats to human health through ingestion, dermal contact, and dust inhalation of contaminated soils; inhalation of soil vapor; and inhalation of volatiles and ingestion of groundwater.

The cleanup levels for Site 1 are presented in Table 2-8 of the OU4 ROD (Navy, 2018). The selected remedy will address contaminated soils only and focuses on PCBs because these compounds are present throughout much of Site 1, representing the majority of COC mass, are persistent in the environment, and are detected in groundwater. The COCs will be fully addressed upon the completion of excavation and installation of the GCL.

3.0 Regulatory Framework

Section 104 of the CERCLA and Superfund Amendments and Reauthorization Act (SARA) of 1986 allow an authorized agency to provide for remedial or removal actions and to remove, or arrange for removal of, hazardous substances, pollutants, or contaminants at any time, or to take any other response measures consistent with the NCP as deemed necessary to protect public health or welfare and the environment. The NCP, Title 40 of the Code of Federal Regulations (CFR), Section 300, provides regulations for implementing CERCLA and SARA and regulations specific to removal actions. The NCP defines a removal action as:

> [The] cleanup or removal of released hazardous substances from the environment, such actions as may be necessary to monitor, assess, and evaluate the threat of release of hazardous substances; the disposal of removed material; or the taking of such other actions as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or to the environment, which may otherwise result from a release or threat of release.

3.1 Regulatory Process

The Navy is directing this remedial action under the Navy ER Program in accordance with requirements of CERCLA and the NCP. The work will be executed in accordance with Section 121(e) of CERCLA (42 United States Code [USC], Section 9621[e]), as amended, which states that no federal, state, or local permits shall be required for the portion of any removal or remedial action conducted entirely on site. Because the work under this RAWP is executed to support a remedial action, permits are not required for remedial action activities conducted entirely on site. All substantive requirements will be met. Required Town of Oyster Bay permits for work affecting public roads are detailed in Section 5.1.

3.2 Remedial Action Objectives

As stated in the OU4 ROD (Navy, 2018), the primary objective of the remedial action is to remove PCB-contaminated soil with concentrations greater than one-mg/kg to a depth of two-ft. bgs and 10-mg/kg to a depth of 10-ft. bgs; and to excavate PCB-contaminated soil with concentrations greater than 50-mg/kg to a depth of 20-ft. bgs at Site 1 and to a depth of 30-ft. bgs at Dry Well 20-08. Other COCs identified during previous investigations co-located with PCBs will be removed as a result of excavation.

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4.0 Project Requirements

Required project plans are discussed in this section.

4.1 Project Schedule

The project schedule is provided as Appendix A of this RAWP. The schedule provides a detailed listing of project components and the projected time to completion.

4.2 Sampling and Analysis Plan

A SAP, which includes a Field Sampling Plan and Quality Assurance Project Plan (QAPP), is provided in conjunction with this RAWP (ATPIM, 2018b). The SAP was developed in accordance with the Uniform Federal Policy guiding the development of QAPPs and the Department of Defense Policy and Guidelines for Acquisitions Involving Environmental Sampling and Testing.

4.3 Accident Prevention Plan

An APP is provided in conjunction with this RAWP (APTIM, 2018a). The APP was prepared to support fieldwork for the remedial action in accordance with the *Safety and Health Requirements Manual EM 385-1-1* (USACE, 2014) and *UFGS Section 01 35 26 Governmental Safety Requirements* (NAVFAC, 2012). The APP includes a Site Safety and Health Plan, Activity Hazard Analyses, and Health, Safety, and Environment Procedures.

4.4 Project Quality Control Plan

A PQCP is provided as Appendix C of this RAWP. The PQCP details definable features of work, phases of control, and QC procedures which will be implemented throughout the remedial action and during restoration activities.

4.5 Environmental Protection Plan

An EPP is provided as Appendix D. The EPP outlines the specific environmental concerns that will be addressed during the implementation of the remedial action, including personnel training, site corrective actions, erosion and sediment (E&S) control, contamination prevention, spill control, and air pollution and noise control. The EPP was developed in accordance with all applicable local, state, and federal regulations.

4.6 Storm Water Pollution Prevention Plan

A SWPPP is provided in conjunction to this RAWP (APTIM, 2018c). The SWPPP describes the management that will be implemented throughout construction activities to prevent storm water

pollution from entering the municipal storm systems and ultimately, larger bodies of water. The SWPPP was prepared to support field work for the remedial action in accordance with New York's State Pollution Discharge Elimination Systems Private/Commercial/Institutional General Permit. An E&S Control Plan (ESCP) is provided as Appendix B to the SWPPP.

4.7 Traffic Control Plan

A TCP is provided in conjunction to this RAWP (APTIM, 2018d). The TCP describes the traffic management and materials that will be implemented throughout construction activities. A Site Agreement will be provided in conjunction with the TCP for review by the Town of Oyster Bay.

4.8 Waste Management Plan

A WMP is provided as Appendix E of this RAWP. The WMP documents all contractual, legal, and risk-management requirements in the generation, storage, sampling and analysis, waste typing, transportation, treatment, and ultimate disposal of all waste during the remedial action. The WMP includes the following:

- description of the wastes expected by types;
- description of minimization techniques for reducing the generated quantities of investigation derived waste;
- review of applicable federal, state, and local regulatory criteria governing the management of these materials;
- characterization rationale for solid and liquid waste materials; and
- rationale for on-site management of each expected waste type; and waste transportation, treatment, and disposal methods.

4.9 Site Plan

The Site Plans are provided as Figures 3, 4, and 5. The Site Plans present proposed work areas, including exclusion zones, decontamination zones, material stockpile areas, temporary facilities, and haul roads for each phase of work.

4.10 Operation and Maintenance Plan

An Operation and Maintenance (O&M) Plan will be provided following completion of construction activities. The O&M Plan will describe the actions to be completed during the 30-month period following post-construction activities, including inspections to be performed, the

mechanism for the making of repairs, and actions to be taken to establish long-term success of vegetation.

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5.0 Pre-Construction Activities

Pre-construction activities are discussed in the following subsections.

5.1 Permitting and Notifications

APTIM will obtain all necessary authorizations from NAVFAC Mid-Atlantic for performing the remedial action at Site 1. Prior to field activities, APTIM will notify the Navy Remedial Project Manager (RPM), NWIRP Bethpage Project personnel, and appropriate personnel, as applicable, as to the nature of the anticipated work. APTIM will also contact New York 811 one-call, in addition to contracting a private utility locator to perform a utility mark out at Site 1.

Road permits associated with Aerospace Boulevard and 11th Street will be acquired, prior to mobilization. APTIM will provide the project information/drawings and necessary applications and fees to obtain applicable permits from the Town of Oyster Bay. Additional details regarding the required permits are discussed below.

Work will be conducted in accordance with Section 121(e) of CERCLA (42 USC, Section 9621[e]), as amended, which states that no federal, state, or local permits shall be required for the portion of any removal or remedial action conducted entirely on site. Because the work under this RAWP is executed to support a remedial action, no other permits and fees are required for remedial action activities conducted entirely on site.

5.1.1 Street Opening and Partial Street Closure Permits

During site preparation activities, concrete traffic barriers and temporary fencing will be placed on the existing curb, gutter, and site perimeter parallel to 11th Street. Approximately 65 traffic barriers (10-ft. long and three-ft. high) will be positioned along the length of the street (approximately 650-ft.) using a wheeled loader.

In addition to the jersey barriers, approximately 650-ft. of freestanding eight-ft. high temporary chain link fence with link panels will be installed along the curb, parallel to 11th Street. Each fence post will be installed 10-ft. off center into a galvanized steel pipe base. The temporary fence will be in accordance with Drawing C-501 of the Design Drawings (Appendix B).

Due to the site preparation activities on 11th Street, a partial street closure will be required to safely install the traffic barriers and temporary fencing. At the conclusion of the installation, the barrier will occupy approximately 18-in. of 11th street.

Prior to work on 11th Street, a Street Opening and Partial Street Closure Permit will be obtained from the Town of Oyster Bay. Traffic control procedures and operations will be conducted as described in the TCP (APTIM, 2018d).

5.2 Preparatory Activities and Meetings

Prior to mobilization, pre-construction and mutual understanding meetings will be held leading up to the project to establish and review the work schedule, discuss project-related topics, and activities.

Additional meetings will be held for the duration of the project to review QC, health and safety performance, sample results, and other pertinent project information. Details regarding the meetings to be held during field activities are provided in Section 7.3.

5.2.1 Pre-Construction and Mutual Understanding Meeting – Navy

A pre-construction and mutual understanding meeting will be held prior to mobilization of equipment and personnel. The purpose of the meeting will be to discuss project-specific topics, roles, and responsibilities of all project personnel, project schedule, health and safety concerns, and other topics that require discussion before field mobilization. The pre-construction meeting will be attended by representatives of the following:

- Navy RPM, NWIRP Bethpage project personnel, others as applicable
- APTIM [Project Manager, Deputy Project Manager, Site Construction Manager, Project QC Manager, and Site Safety and Health Officer (SSHO)]
- Subcontractors as appropriate

5.2.2 Pre-Construction and Mutual Understanding Meeting – Town of Oyster Bay

A pre-construction and mutual understanding meeting will also be conducted with Town of Oyster Bay personnel prior to mobilization of equipment and field crew. This meeting, conducted with the Navy, will serve to coordinate activities with the Town of Oyster Bay and discuss project schedule, activities, and impacts to traffic patterns when import and export of materials is ongoing.

5.3 Mobilization

At least two weeks prior to mobilization, the Navy RPM will be notified regarding the planned schedule for mobilization and site remediation activities. Upon receipt of the appropriate authorizations, permits, licenses and training certificates, field personnel, temporary facilities, and required construction materials will be mobilized to the site. Mobilization activities will include site preparation, movement of equipment, materials, and temporary facilities to the site,

establishment of an equipment decontamination area, and orientation and training of field personnel.

5.4 Site Preparation

Site preparation activities include mobilization of temporary construction facilities/equipment to the site, construction of an equipment decontamination area, utility clearance/relocation, and site set-up. Site preparation activities are discussed in the following subsections.

5.4.1 Pre-Construction Survey

A photographic pre-construction survey of Site 1 will be performed to document the conditions of the site prior to earth-disturbing work. Upon completion of the project scope of work, data from the photographic pre-construction survey will be used to restore impacted areas to pre-existing conditions.

5.4.2 Temporary Construction Facilities

An exclusion zone will be established as necessary around work areas and delineated with high visibility temporary fencing, or equivalent, and have the appropriate signage posted (Figures 3, 4, and 5). Work performed in or near roadways will be coordinated with the Construction Manager, local tenants, and other site users to implement the TCP and coordinate road closures as needed for site personnel safety. Traffic control facilities and signs will be established in accordance with the TCP (APTIM, 2018d).

Temporary facilities to be mobilized to the site will include a contractor and NAVFAC field office, portable toilets, hand washing stations, a secure storage (conex) box for short- and long-term storage of materials, signage, fencing, truck scale, and designated construction roads and parking areas. APTIM will provide electricity and potable water required for the project operations.

The site layout will be modified for each phase of work and is shown on Figures 3,4, and 5.

5.4.2.1 Material Handling and Storage Areas

The material handling and storage areas will be installed at the locations shown on Figures 3, 4, and 5. The excavated materials storage area will be constructed using 40-millimeter (mm)-thick polyethylene liner and contained using five-ft. tall concrete barriers. This approach will ensure a longer life cycle than hay bales and will provide a more durable barrier to protect against contaminant migration. Stockpile slopes will be less than 2H:1V and will be covered with 10-mm-thick polyethylene sheeting and secured with sandbags when not in use.

Excavated materials to be stockpiled in the material storage areas include concrete, asphalt, and soils. Each material type will be segregated in respective piles and labeled for tracking purposes while awaiting disposal.

5.4.2.2 Equipment Decontamination Area

Prior to beginning project activities, an equipment decontamination pad will be constructed at the location shown on Figure 3. The decontamination area will be constructed using eight-ounce (oz.) nonwoven geotextile, six-mm polyethylene sheeting, one- to four-in. aggregate, and wooden mats. Decontamination water will be pumped from the decontamination pad using a six-in. diesel pump and sump with a 25-ft. hose through a 10-oz. filter bag to be stored in a 20,000-gallon (gal) portable storage tank. Prior to off-site disposal, stored decontamination water will be sampled for waste characterization analysis.

All vehicles and equipment utilized in the Exclusion Zone will be decontaminated in the equipment decontamination area prior to leaving the site. Site materials such as dirt and mud from vehicles will be removed via power washer prior to accessing a public roadway. Equipment contacting known or suspected PCB-impacted material shall be decontaminated at the work area prior to relocation to the support zone. Equipment decontamination will be conducted in accordance with the EPP.

5.4.2.3 Truck Scale and Appurtenances

A weight facility including a scale house, scales, scale pit, and approach slabs will be constructed by a qualified subcontractor to manage the truck traffic during material export. Certified design drawings of the scale pit and approach slabs will be signed and sealed by a Professional Engineer Registered in the state of New York prior to the construction of the truck scale and appurtenances. An O&M manual will be prepared following the installation to include required cuts, drawings, equipment list, descriptions, maintenance and lubrication schedules, troubleshooting guides, spare parts lists, etc., that are required to instruct personnel unfamiliar with the equipment.

5.4.2.3.1 Scale House

The scale house will be a portable office trailer, approximately 10-ft. by 10-ft. located adjacent to the truck scale. The scale house will serve as the scale operator booth and house the scale software equipment, readouts, and printers associated with the truck scale. The scale software equipment (Fairbanks, Model No 8811; Toledo, Model TSM 3000 and 8132, or equal) will include an electronic solid state, digital indicator that will be located on a counter top and arranged with a readout window and operating panel with control buttons and switches at the front. The software equipment will be capable of storing weights in memory, accumulating product code net weights,

displaying net weights of a gross load, and self-diagnostics. The printer will be used to print weight tickets and will be a solid state, microprocessor design capable of printing a minimum of 40 characters per line and a minimum of four copies.

An additional surge voltage system will be furnished and installed to protect the equipment from surges in the power supply. The system will be a two-stage type with a response time of less than one-millionth of a second. Surge voltage protection will be Fairbanks, Model No 1403; Toledo, Model 913, or equal.

5.4.2.3.2 Installation

The scale pit will be installed to accommodate a BTek Centurion AT Truck Scale. The scale pit foundation will be designed and installed for a frost depth of 54-in. below finished grade and have a bearing capacity of 2.0 kilo-pounds per square foot (SF). The subgrade will be prepared to the required dimensions to house the truck scale prior to completion of concrete placement. Class A, American Society for Testing Materials (ASTM) C 150 Type II Portland Cement will be cast-in.-place following subgrade preparation and have a minimum compressive strength (28-day) of 4,000-pounds (lb) per square inch (in^2). Associated weighing levers will be high strength cast iron or steel.

The approach slabs will be cast-in.-place utilizing the same concrete material as the scale pit. Approximately 374-cubic feet (ft^3) of concrete will be required to install two approach slabs at a maximum grade of seven percent (%).

In addition, a load cell cable to include conduit, installation of load cable, and connecting cable from scale to operations will be furnished and installed.

5.4.2.3.3 Inspections

Following installment of the truck scale, a factory representative with complete knowledge of the proper O&M will inspect the final installation, calibrate the equipment, and supervise a test run of the equipment for up to three days.

The truck scale will meet the performance and design criteria provided in Specification 10 88 00 of the Project Specifications (Appendix B). The Specifications conform to or exceed the requirements of National Bureau of Standards Handbook 44 for use in commerce.

5.4.2.4 Haul Road

A 12-ft. wide haul road will be constructed and used to transport soil, using trucks, from the material storage area to the truck scale, as well as importing clean fill to the various phases (Figures

3, 4, and 5). The haul road will be constructed in accordance with the Stabilized Construction Access Detail provided on Drawing C-500 of the Design Drawings (Appendix B).

The haul road soils within the excavation area will be the last excavated once all other materials have been transported off-site.

5.4.3 Land Surveying

Land surveys will be performed for the duration of the project by a Registered Land Surveyor (RLS) licensed and registered in New York. Grid spacing for surveys will be a maximum of 50-ft. with survey points at the top, mid-point, and bottom of each slope, along each linear feature and at locations required to define the surfaces. At a minimum, the following surveys will be performed:

- Existing ground surface prior to earth-disturbing activities.
- Ground surface after excavation prior to backfilling and GCL placement, if applicable.
- Top of the soil cover, other surface materials, and all other finished grades at the completion of backfilling activities.
- Exposed and underground linear features prior to backfilling at 50-ft. maximum intervals, changes in slope and/or direction and intersections with other linear features.

The RLS will verify all excavation depths throughout construction activities, including establishing survey points at the top, mid-point, and bottom of each slope, document the limits of the GCL, mark the locations of all replaced underground utilities, and conduct a final as-built survey at the completion of construction.

Surveying will be performed in accordance with Section 01 71 23 of the Project Specifications (Appendix B) by a RLS licensed and registered New York.

5.4.4 Erosion and Sediment Control Measures

E&S controls will be performed in accordance with the approved ESCP (found in Appendix B of the SWPPP) and as described in the following sections. E&S control measures will be installed at the locations shown on Figures 1 and 2 of the ESCP (Appendix B of the SWPPP). E&S control measures will be inspected and maintained to ensure they are functioning as designed. Monitoring and maintenance activities associated with the E&S control are described in the ESCP (Appendix B of SWPPP) (APTIM, 2018c).

5.4.5 Utility Survey and Relocation

Prior to beginning earth-disturbing work, gas and water lines within the limits of the excavation will be relocated and a storm drain will be removed and relocated. In addition to contacting the New York 811 one-call center prior to any intrusive activities, APTIM will contract a private utility locator to perform a utility mark out at Site 1. A field inspection to verify the locations of the utilities, if present, will be conducted prior to removal activities. Any underground utilities that are impacted by soil removal activities will be relocated or removed in accordance with the following sections.

5.4.5.1 Water Line Relocation

An existing water main and two fire hydrants are located within the boundary of the Dry Well 20-08 excavation. Location of the water main and fire hydrant are shown on Existing Conditions Site Plan (Drawing C-100 of the Design Drawings [Appendix B]). Prior to earth-disturbing work at Dry Well 20-08, the fire hydrants will be relocated/removed, the existing water main will be removed, and a new fire main will be installed.

The eastern-most fire hydrant will be removed. The western-most fire hydrant will be relocated approximately 20-ft. due-west and installed with a 10-in. gate valve. Prior to removal, the existing water main will be shut off and capped in accordance with APTIM's Control of Hazardous Energy Procedure (AMS-710-02-PR-01500). The water main will be removed using an excavator to extract the existing pipe and will be stored in the laydown area to be disposed of off-site. Approximately 200-linear feet (LF) of the water line will be removed and replaced with approximately 275-LF of polyvinyl chloride (PVC) pipe.

The nominal pipe size (NPS) for the PVC to be installed will be 10-NPS. Approximately two 90-degree and one 11.25-degree connectors with corresponding thrust blocks will be installed. Thrust blocks will be approximately 13.125-ft.^{3} and two-ft.^{3} for the 90-degree and 11.25-degree, respectively.

Locations for pipe installation will be trenched to the required alignment grade as specified on Drawing C-503 of the Design Drawings (Appendix B). In invert elevations where rock or unsuitable/unstable conditions are encountered, a minimum of one-ft. and maximum of two-ft. of material will be excavated and replaced with select granular fill.

A minimum10-ft. horizontal and 1.5-ft. vertical separation distances will be maintained in areas requiring storm drain conduit installations parallel to water mains.

Water line relocation will be performed as specified on Drawing C-504 of the Design Drawings (Appendix B).

5.4.5.2 Gas Line Relocation

The existing gas line intersects the western portion of the Dry Well 20-08 area. Prior to intrusive activities, the existing gas line will be removed and approximately 265-ft. will be installed outside of the excavation boundary. Gas line relocation activities may be performed in concurrence with water line relocation activities. Gas line relocation activities will be performed by National Grid, in accordance with their current standards and procedures at the time of installation.

5.4.5.3 Storm Drain Utilities

Reinforced concrete pipe (RCP) storm drains intersect the Dry Well 20-08 area and will require abandonment/removal and replacement. Approximately 110-LF and 220-LF of RCP pipe will be removed and abandoned, respectively.

Storm drain installation activities will be performed in accordance with Section 33 44 00 of the Project Specifications (Appendix B).

5.4.5.3.1 Materials

Prior to shipment of materials to the site, precast concrete will be subject to material testing. Manufacturer(s) of the material to be used will conduct slump, temperature, compressive strength, air content, and unit weight tests and provide the corresponding reports. Tests will be performed in accordance with ASTM standards, as applicable. Each shipment of precast concrete will be accompanied with a QC signed or stamped delivery ticket providing the description and list of the products.

Piping materials will be inspected for defects upon receipt and prior to installation.

5.4.5.3.2 Installation of Pipe

Installation of the pipe, to include pipe laying and jointing, will be performed in accordance with the manufacturer's recommendations. Pipe installation will begin at the lowest point and proceed toward higher elevations. In invert elevations where rock or unsuitable/unstable conditions are encountered, a minimum of one foot and maximum of two foot of material will be excavated and replaced with select granular fill.

Approximately 274-LF of 36-in. diameter pipe will be installed at a 0.34% slope to the east of the Dry Well 20-08 excavation footprint. An additional manhole will be installed approximately 163-

LF from the southern end of the new pipe. The northern and southern ends of the pipes will be connected to the existing manholes from the current system.

Approximately 70-LF of 15-in. diameter pipe will be installed from the newly installed manhole in the western direction. An additional storm inlet grate will be installed at the western end of the pipe. Due to the location of the 15-in. pipe, installation will be performed post-excavation of Dry Well 20-08.

Pipes will be temporarily braced and secured in position at the correct alignment and grade until backfilling activities are complete.

5.4.5.3.3 Backfilling and Compaction

Following excavation and installation of the RCP, compact backfill will be placed in the trench surrounding the pipe. Backfill materials will be in accordance with Section 31 23 00 of the Project Specifications (Appendix B).

5.4.5.4 Force Main Removal

The existing force main is located along the northern boundary of Dry Well 20-08. The force main has been previously abandoned and will be removed using an excavator. Approximately 160-ft. of the previously abandoned force main will be removed.

5.5 Site Safety and Security

APTIM is responsible for the security and safety of all APTIM equipment and facilities, and will confine all operations, including the storage of materials, to the designated areas of the site as shown in Figure 6. APTIM will ensure that site activities do not impact the adjacent tenant operations and community members. Tools and small equipment will be secured daily in the locked conex storage box. All heavy equipment will be stored in the designated equipment laydown area shown in Figure 6. Incidents such as theft and notable damage will be reported to the APTIM Project Manager, who will inform the Navy.

Vehicular access to the site shall be restricted to authorized vehicles only. APTIM will allow entrance only to authorized persons with proper identification. All personnel having access to the site will sign in and sign out on a log, including the time of entry and departure from the site each day. All approved visitors to the site will be briefed by APTIM on safety and security, provided with temporary identification and safety equipment, and escorted by APTIM throughout the visit. Visitors will require Level D personal protective equipment to enter the site, including a hard hat, steel-toed boots, safety glasses, and a high visibility vest, to ensure safety of all personnel.

5.6 Clean Import Fill Materials

Sources for imported clean fill materials will be identified prior to backfilling activities. All analytical requirements and procedures for clean fill verifications are provided in the SAP (APTIM, 2018b). Imported common fill and topsoil will meet the requirements found in Project Specifications Section 31 23 00 (Appendix B). All testing will be document on the Testing Plan and Log included as Exhibit V-1 of the PQCP (Appendix C). The name of the vendor and copy of the analytical results will be provided to the Navy and NYSDEC for review and acceptance prior to importing the materials.

6.0 Remedy Implementation

This section describes the specific construction activities and procedures to implement the remedial action requirements.

6.1 Site Clearing

Clearing will be performed in two phases. During the initial phase, all vegetation will be cleared with the exception of the trees and shrubs located along the eastern perimeter of the site. The shrubs and trees within 20-ft. of 11th Street will remain as a barrier until the deep excavation and backfilling have been completed. During the second phase, the perimeter vegetation will be cleared to complete the two-ft. deep excavation along the eastern border of the site.

Chainsaws, line trimmers/brush hogs, and an excavator will be used as applicable by qualified operators to clear the vegetation from within the limits of excavation in the phases explained above. Trees, limbs, and brush smaller than 12-in. in diameter will be chipped and placed at the material storage area to facilitate composting. Compost will be tested during compost operations for the parameters listed in Table 1 of Specification 31 10 00 of the Project Specifications (Appendix B) at a rate of one sample per 2,000-cubic yards (CY). Compost QC testing will be document on the Testing Plan and Log included as Exhibit V-1 of the PQCP (Appendix C). Soil-impacted root balls will be downsized using the excavator and transported and disposed of in accordance with applicable state, federal, and local requirements.

Approximately 1,890-ft. of existing fence within the excavation footprint will also be removed and recycled off-site.

6.2 Demolition of Existing Tank

The remaining former settling tank located under the raised berm along the northern boundary will be demolished during the Phase III excavation. Upon location of the tank, soil coverage will be stripped away using an excavator to expose the limits of the tank. The excavator with ram attachment will be used to break apart the exposed walls and demolish the tank to below finish grade elevation (approximately two-ft. bgs).

Concrete removed from the tank will be downsized into manageable pieces using the excavator with ram attachment and stockpiled in approximately 500-CY piles in the northern material storage area. The concrete stockpile will be labeled to track and manage the generated waste prior to off-site recycling. Chip samples will be collected from the concrete and analyzed in accordance with the SAP (APTIM, 2018b).

6.3 Installation of Excavation Shoring/Sheet Piling

Prior to excavation in Phase IIB (Dry Well 20-08), after utility relocation, and concurrent to excavation in Phase IIA, sheet piling will be installed around the perimeter of the Phase IIB. Approximately 430-LF of 50-ft. vertical depth interlocking AZ26 sheet piling will be installed around the Dry Well 20-08 excavation area. Approximately 270-LF of 50-ft. vertical depth interlocking AZ26 steel sheet piling will be installed along the western boundary of the main excavation area. Sheet piling will be constructed in accordance with Section 31 41 16 of the Project Specifications (Appendix B) and installed in accordance with the subcontractor's approved Shoring Plan. Sheet piling locations are provided in Figure 6.

A Seismic Vibration Monitoring Plan will be submitted for review Seismic activity will be monitored along 11th Street and the southwest corner of the site throughout sheet piling activities. Baseline seismic activity of the area will be measured before the commencement of sheet piling installation.

Concrete barriers will be installed around the Dry Well 20-08 excavation area and along the north-south sheet pile where the excavation may be greater than five-ft. deep for fall protection. All sheet piling will be installed by a qualified subcontractor. Information regarding drawings, design calculations, product data, details of installation, installation equipment, and construction procedures will be submitted to the Navy for approval prior to sheet piling activities.

Following completion of the excavation and backfilling activities, the sheet piling will remain in place. However, the sheets will be cut off approximately three-ft. bgs to limit impacts to future activities.

6.4 Excavation

Site 1 will be excavated within four unique phases:

- Phase I – Southern Area
- Phase IIA – Central Area
- Phase IIB – Dry Well Excavation
- Phase III – Northern Area

All excavation activities will be performed in accordance with Section 31 23 00 of the Project Specifications (Appendix B). For constructability, the main excavation area has been divided into four phases; I, IIA, IIB and III (Figures 3, 4, and 5). Excavation activities will begin in Phase I and proceed towards Phase III.

In order to maintain a cut slope of less than or equal to 1.5H:1V for Type C soil, excavation areas 20-ft. in depth or less will be sloped in accordance with 29 Code of Federal Regulations 1926 Subpart P Appendix B (OSHA, 2010), except where protected by sheet piling.

Overburden soils are anticipated to be encountered from two- to 10-ft. bgs in excavations where a depth of 20-ft. bgs is required, from surface to 20-ft. bgs in Dry Well 20-08, and in the berms on the eastern side of the site. The zero- to two-ft. bgs excavation will begin once the berms have been removed. The overburden soils from these areas are considered clean and will be stockpiled for reuse as backfill during site restoration. During excavation of the clean overburden material, field personnel will observe the depths to ensure contaminated soils are not comingled.

Clean overburden and contaminated materials will be stockpiled as discussed in the following sections. Soil stockpiles will remain covered with polyethylene sheeting or tarps when not in use to prevent soil migration from the containment cell. Contaminated excavated soil will be sampled for waste characterization as discussed in Section 6.6 and then transported off-site to an approved disposal facility as discussed in Section 6.8. Stockpiles will be sampled for waste characterization as soon as possible following excavation to minimize the amount of time spent in the excavated materials staging area. Because of limited space on site, stockpiles will not remain on site longer than necessary to receive waste characterization analytical results and conduct transportation and disposal activities. Table 1 details the volumes calculated for excavation activities.

Dewatering activities are not anticipated throughout excavation. Excavation activities will not reach the groundwater table, and rainfall is expected to infiltrate back into the ground. Additionally, sheet piling and E&S controls will prevent stormwater runoff from entering the excavation areas. However, in the case that heavy rains result in ponding water, the excavation will be dewatered and containerized for off-site disposal. Air monitoring for dust and VOCs will be conducted during excavation activities in accordance with the New York State Generic Community Air Monitoring Plan, and all monitoring data will be provided to NYSDEC weekly. Additional details are provided in the EPP (Appendix D) and the Site Safety and Health Plan (Appendix B of the APP).

6.4.1 Phase I Excavation

Phase I is approximately 1.18-ac. (Figure 3). Soils in Phase I will be excavated from west to east to a depth of two-ft. bgs. Contaminated soil excavated from Phase I will be stockpiled in the central area of Site 1, as depicted on Figure 3, while awaiting waste characterization sampling and off-site disposal.

Pavement located in Phase I will be removed using the excavator and broken into manageable pieces to be recycled at an approved off-site facility. Gravel will be disposed of with the excavated soil.

During excavation activities in each area, a New York RLS will verify the depth of the excavation as discussed in Section 5.4.3.

6.4.2 Phase IIA Excavation

Phase IIA is approximately 1.87-ac. (Figure 4). The entire limits of Phase IIA will be excavated to a depth of two-ft. bgs using an excavator. Within the limits of Phase IIA, there is one area designed to be excavated to a depth of 10-ft. bgs. Within the 10-ft. bgs excavation there are two areas to be excavated to a depth of 20-ft. bgs. Excavation locations and depths within the Phase IIA are shown on Figure 6. All excavation areas will be staked by a New York RLS prior to excavation.

Following excavation to a depth of two-ft. bgs over the entire Phase IIA limits, deeper excavations in overlapping areas will be conducted. First the area designed to be excavated to a depth of 10-ft. bgs will be completed using an excavator. Then, the areas to be excavated to a design depth of 20-ft. bgs will proceed in the designated areas.

Excavated contaminated material will be stockpiled in the excavated material stockpile area located on the pavement west of Phase IIA, while awaiting waste characterization sampling and off-site disposal (Figure 4).

During excavation activities in Phase IIA, a New York RLS will verify the tops, mid-slope, and depths of the excavations as discussed in Section 5.4.3.

6.4.3 Phase IIB Excavation

Following the relocation of underground utilities and installation of sheet piling, the excavation of Phase IIB, Dry Well 20-08, will commence. The Phase IIB excavation area is approximately 0.2-ac. (Figure 4).

Pavement located in the Phase IIB area will be stripped using the excavator and broken into manageable pieces to be recycled at an approved off-site facility. An excavator will be used to remove the clean overburden material from the surface to 20-ft. bgs in the Phase IIB area. The clean overburden soil will be relocated into the completed Phase IIA or Phase III excavated areas and used as backfill. Using a long reach excavator, contaminated material will be excavated from 20- to 30-ft. bgs and stockpiled within the excavated material stockpile area located on the pavement south of Phase IIB (Figure 4).

During excavation activities in Phase IIB, a New York RLS will verify the depth of the excavation as discussed in Section 5.4.3.

6.4.4 Phase III

Phase III is approximately 1.23-ac. (Figure 5). The entire limits of Phase III will be excavated to a depth of two-ft. bgs using an excavator. Within Phase III, there are six areas designed to be excavated to a depth of 10-ft. bgs and three areas designed to be excavated to a depth of 20-ft. bgs. As noted on Figure 6, two areas requiring excavation of contaminated soil to a depth of 10-ft. bgs are within the boundaries of areas requiring excavation of contaminated soils from the depth of 10- to 20-ft. bgs. All excavation areas will be staked by a New York RLS prior to excavation.

Following excavation to a depth of two-ft. bgs over the entire Phase III limits, deeper excavations in overlapping areas will be conducted. First the areas designed to be excavated to a depth of 10-ft. bgs will be completed using an excavator. Then, the areas to be excavated to a design depth of 20-ft. bgs will proceed in the designated areas. In areas where the 10-ft. bgs excavation depth is within the boundaries of areas requiring removal of contaminated soils from 10- to 20-ft. bgs, the remaining clean overburden soil from two- to 10-ft. bgs will be removed and relocated into the completed Phase IIA footprint.

Excavated contaminated material will be stockpiled in the excavated material stockpile area located on the pavement west of Phase III, while awaiting waste characterization sampling and off-site disposal (Figure 5).

During excavation activities in Phase III, a New York RLS will verify the tops, mid-slope, and depths of the excavations as discussed in Section 5.4.3.

6.4.5 Cesspool Removal

Approximately 120 cesspools are located within the excavation boundaries and require removal (Figure 6). Upon identification, the cesspools will be removed to the designated excavation depth of the area it is located within. The materials and soil associated with cesspool removal have the potential to contain elevated PCB and VOC concentrations, and therefore, will be stockpiled and sampled for waste characterization separately from other excavated materials within the excavated material stockpile area.

6.4.6 Piezometer Decommissioning

Eight piezometers within the excavation footprint will be decommissioned during intrusive activities. The locations of the piezometers can be found on Figure 6.

Piezometers will be decommissioned in accordance with the CP-43 Groundwater Monitoring Well Decommissioning Policy (NYSDEC, 2009). One or more decommissioning methods will be selected to ensure the piezometers are properly removed to prevent contaminant migration into a potential groundwater pathway. The selection process for decommissioning procedures is provided by the flow chart in Table 2.

6.5 Geosynthetic Clay Liner

A GCL will be installed by a qualified installer above the 20-ft. depth excavations and above the Dry Well 20-08 excavation to reduce leaching of contaminants from unsaturated soil to the groundwater. Approximately 35,000-SF of GCL will be installed over the excavation reaching a minimum of 20-ft. bgs in Phase IIA, Phase IIB, and Phase III. These excavations are depicted on Figure 6.

6.5.1 GCL Material

The GCL to be used to line the appropriate excavations will be a combination of polypropylene geotextiles and high swelling bentonite manufactured using the needle punch process. The GCL will be formulated with two major components; encapsulating geotextile and reinforced bentonite geocomposite liner.

The geotextile will be made of polypropylene. The non-woven component will be a minimum of six-oz. per square yard (yd^2) needle punched geotextile and the woven component will be a minimum of 3.2-oz./yd^2 silt film woven geotextile.

The reinforced bentonite geocomposite liner will be BENTOMATE ST manufactured by Colloid Environmental Technologies Company of Arlington Heights, Illinois BENTOFIX NSL by National Seal Company of Aurora, Illinois.

Rolls of GCL will be manufactured with minimum specifications of 12-ft. wide by 120-ft. long and packaged in photo degradation-resistant packaging. Handling and storage of the GCL will be in accordance with the manufacturer's recommendations and ASTM D5888 Guidance. The rolls of GCL will be protected from puncture, dirt, grease, water, moisture, mud, mechanical abrasions, excessive heat, and ultraviolet rays. The rolls will be stored on a prepared surface elevated a minimum of three-in. above ground surface and will not be stacked more than three rolls high. A tarpaulin will be used over the stacked rolls to provide extra protection for GCL stored outdoors.

6.5.2 GCL Installation

GCL's will be installed at each excavation during backfilling activities. The GCL will be placed over the soil fill at an elevation of 118.5-ft. below finished grade and will extend approximately five-ft. from the excavation boundaries.

Prior to placement, GCL material will be inspected to ensure no rips or tears are present within the liner. This inspection will be documented in a condition report, which will include photographs. The panels will be placed will be placed with the non-woven side of the liner against the subgrade and the woven side oriented upwards. GCL will not be installed on side slopes.

Where required, seams will overlap a minimum of 12-in. and verified by the installer. Contacting surfaces will be cleaned of dirt, soil, and rock prior to overlap with all edges pulled tight to maximize contact and to smooth wrinkles/creases. To ensure seam integrity, granular bentonite of the same type used within the composite liner will be dispersed evenly from the panel edge to the lap line at a minimum rate of 0.25-lb/LF. Approximately 900-lb of granular bentonite will be required within the seam areas.

Upon installation, the elevation and extent of the GCL will be recorded by a land surveyor and documented within as-built drawings for inclusion in the Construction Completion Report. GCL materials and installation will be in accordance with Section 31 30 00 of the Project Specifications (Appendix B).

6.5.3 GCL Maintenance

Visible large rips and tears will be repaired by completely exposing the affected area, removing large rocks/soil, and placing a large patch over the damage with a minimum 12-in. overlap from the edges. Granular bentonite will be placed at the overlaps at the frequency described in section 6.5.2.

6.6 Waste Characterization Sampling

Waste characterization samples will be collected from soil, concrete, and decontamination water as described below. All waste characterization samples will be collected and analyzed by a New York State Department of Health Environmental Laboratory Analytical Program certified laboratory in accordance with the approved SAP (APTIM, 2018b). Laboratory certificates are provided in Appendix A of the SAP. All testing will be document on the Testing Plan and Log included as Exhibit V-1 of the PQCP (Appendix C).

6.6.1 Soil

Waste characterization sampling and analysis will be conducted on all excavated soil at a frequency of one sample per 500-CY. The samples will be collected as composite and discrete grab samples from the stockpiles of excavated soil located in the material storage areas. The purpose of the composite sample is to characterize the soil excavated by collecting a sample that would represent the average concentration of the soil to be disposed.

Composite waste characterization samples will be analyzed for PCBs, ignitability, corrosiveness, reactivity, Toxicity Characteristic Leaching Procedure (TCLP) metals, target compound list (TCL) SVOCs, pesticides, and herbicides and discrete waste characterization samples will be analyzed for VOCs to characterize the material for disposal. Additional sampling and comparison values may be required based upon the proposed approved facility requirements.

Excavated soils will be pre-characterized as Toxic Substances Control Act (TSCA) hazardous waste based on previous sampling conducted by the Navy. TSCA soil stockpiles will remain segregated from other excavated soils. Once waste characterization analytical results have been received, any previously identified non-hazardous soil stockpiles with PCB levels above 50 parts per million will be combined with existing TSCA stockpiles. Hazardous and non-hazardous soil stockpiles will be transported and disposed of accordingly at the approved facilities.

6.6.2 Concrete

Discrete grab chip samples will be collected from concrete removed from the limits of excavation and analyzed for PCBs, ignitability, corrosiveness, reactivity, TCLP metals, TCL VOCs, TCL SVOCs, pesticides, and herbicides to analyze the material for disposal. Approximately 200-CY of concrete will be removed and require recycling. If more than 500-CY of concrete is generated, waste characterization samples will be collected at a frequency of one sample per 500-CY of concrete removed from the same general area of the site.

A hammer and chisel or a hammer drill will be used to chip the sampling area to a maximum depth of 0.5-in. with a maximum chip size of 0.5-in. Non-plastic bristle brushes will be used to sweep the sample onto a dustpan and transferred from the dustpan into the sample jar using the bristle brush.

6.6.3 Decontamination Water

Discrete grab samples will be collected from the storage tank to analyze the decontamination water prior to off-site disposal. Approximately 30,000-gal of decontamination water generated throughout the project will required transportation and disposal. One discrete grab sample will be

collected per 20,000-gal storage tank of containerized decontamination water. The discrete grab sample will be collected directly from the storage tank and analyzed for PCBs, ignitability, corrosiveness, reactivity, TCLP metals, TCL VOCs, TCL SVOCs, pesticides, and herbicides.

6.7 Transportation and Disposal of Soil

After review of the analytical results from the waste characterization samples, materials will be transported for disposal/recycling at approved, off-site facilities. Transportation and disposal activities will be continuous throughout the duration of the project due to the anticipated volume of soil. Table 3 provides anticipated volumes and waste types requiring disposal/recycling.

During transportation and disposal activities, haul trucks will be loaded with excavated material using an excavator and/or wheeled loader from the material storage areas. Following loading, all trucks will be inspected, decontaminated, and weighed at the truck scale prior to leaving the site. A dedicated laborer will be assigned to manage the documentation of all exported materials. Trucks entering and exiting the site will follow procedures outlined in the TCP to prevent impacting roadways (APTIM, 2018d).

Water that may accumulate in the decontamination process will be stored in a 20,000-gal storage tank before it is sampled and characterized for disposal. Waste disposition will be completed 15-days following receipt of final waste disposition sample results. At the end of field activities, the tank will be cleaned prior to being demobilized from the site. Wipe sampling of the tank will be conducted to ensure the tank has been properly decontaminated.

Proposed disposal and recycling facilities will be selected dependent on the analytical results from the waste characterization samples. The proposed facilities are provided in Section 4.3.5 of the WMP (Appendix E).

Transportation and disposal of soil and other waste will be performed in accordance with Section 02 81 02 of the Project Specifications (Appendix B).

6.8 Backfilling

All excavated areas will be backfilled within five unique phases:

- Phase I – Southern Area
- Phase II – Central Area
- Phase III – Northern Area
- Phase IV – Dry Well Excavation; Deep Area
- Phase V – Dry Well Excavation; Shallow Area

While Phase I required only a zero- to two-ft excavations, the other Phases will all encompass the zero- to two-ft., two- to 10-ft., 10- to 20-ft., and 20- to 30-ft. excavations. The 20-ft. excavations will be backfilled to an elevation of 118.5-ft. for the installation of the GCL as described in Section 6.5.2. Following the installation of the GCL, the excavations will then be backfilled to within six-in. of the surface. Clean, overburden materials excavated from the 20-ft. excavation areas will be reused as backfill.

Additional clean fill material imported to the site will be spread in 12-in. lifts using an excavator or dozer. Following each lift, a roller or compactor will be used to compact the material, with one-half of the passes in a direction perpendicular to the other passes. Density and moisture content of fill placement will be tested in accordance with ASTM D 6938 at a rate of three tests for every 20,000-SF per lift. Lift thickness will be measured in each lift.

General clean fill will be followed by the placement of a six-in. topsoil layer to support vegetative growth in a portion of the Phase I, all of Phase IIA and Phase III. Base course will be placed prior to restoring the disturbed asphalt areas in Phase IIB. The parking lot and gravel area in the Phase I excavation will be restored to pre-existing conditions.

Following completion of backfilling activities, a topographic survey of the site will be conducted to confirm that elevations are consistent with the Final Grading Plan (Drawing C-106 of the Design Drawings [Appendix B]).

The general fill and topsoil data analysis and soil classification results will be included in a final CCR. Backfill samples will be collected and analyzed in accordance with the approved SAP (APTIM, 2018b) and the NYSDEC Table 375-6.8(b) Restricted Use Soil Clean-Up Objectives for residential use (NYSDEC, 2010).

Imported fill material will meet the requirements in Section 31 23 00 of the Project Specifications (Appendix B). All fill material testing will be documented on the Testing Plan and Log included as Exhibit V-1 of the PQCP (Appendix C).

6.9 Site Restoration

Site restoration activities will begin within 15 days of closure of the soil excavations. Finished grade will be within the acceptable +/- three-in. from the required elevations. The site will be graded to promote positive drainage towards the west.

Areas disturbed during the remedial action will be stabilized by hydroseeding with native species of grasses in the soil removal areas. Additionally, trees removed during clearing activities will be

replaced with trees of similar types and numbers along the eastern border of the site, where a berm will also be constructed. Asphalt removed from Phase IIB will be restored to pre-construction conditions. The truck scales and appurtenances will be deconstructed and demobilized.

Trees delivered to the site for restoration activities will be healthy, shapely, well-rooted and free of infestations and diseases. A tree replacement plan is provided as Drawing C-110 of the Design Drawings (Appendix B).

Seeds and trees delivered to the site during restoration activities will be in accordance with Specification 32 92 19 and 32 93 43 of the Project Specifications, respectively (Appendix B).

After planting has been completed, a chain link fence and gates will be installed around the site, the unnamed roads used for the transportation and disposal route repaired, if needed, and paved areas will be restored with either bituminous concrete or an aggregate surface.

6.9.1 Asphalt and Gravel Parking Areas Restoration

The existing asphalt parking lot and gravel area within Phase I will be restored immediately following excavation and backfilling activities to return the parking lot to the tenants of the adjacent building. The photographic pre-construction survey will be referenced to ensure that the areas are restored to meet pre-existing conditions.

6.9.2 Construction of the Berm

The berm located on the eastern perimeter of the site will be re-constructed and re-vegetated as described below. Clean soil will be used to construct a berm approximately 375-ft. long and five-ft. high to re-establish the barrier.

6.9.3 Vegetation and Planting

Seeds and trees to be planted during site restoration activities will be in accordance with Specifications 32 92 19 and 32 93 43 of the Project Specifications, respectively (Appendix B).

6.9.3.1 Seeding

Permanent grass will be established in disturbed areas using a hydroseeding mixture of seed, mulch, fertilizer, and lime. Seeds will meet the requirement of Section 713 of the New York State Department of Transportation (NYSDOT) Standard Specifications (NYSDOT, 2018) and will be planted during the first optimum planting season following completion of work within the site. Seed mixtures will be applied in a uniform manner in conformance with the application rates and procedures provided by the manufacturer. If required, additional E&S controls such as temporary erosion control blankets or mulch will be placed immediately after seeding to protect the areas.

6.9.3.2 Trees and Shrubs

Established trees and shrubs will be delivered and planted on the eastern portion of the site in accordance with Drawing C-110 of the Design Drawings (Appendix B). Vegetation will be planted as nursery stock plants to develop normal habitats of growth and will be nursery grown. Upon delivery, vegetation will be inspected and verified to be healthy, shapely, well-rooted, and roots show no evidence of having been restricted or deformed at any time. Trees will be 2.5- to three-in. in diameter and be 12- to 15- ft. in height. Trees and shrubs that are damaged upon delivery will be rejected.

Vegetation will be planted within six hours of delivery to the site. Approximately 17 trees will be planted 25-ft. off center on top of the established berm and approximately 25 trees will be planted at 25-ft. off center between the fence and back of the curb on 11th Street. Openings will be constructed using an auger attachment with a small excavator and the trees will be planted and secured until they become established. Trees and shrubs will be set in the center of pits, plumb, and straight prior to backfilling the hole with soil. The root ball will be watered and organic mulch of wood chips and leaves will be applied at the base of the plant.

6.9.4 Chain Link Fence Installation

Approximately 650-LF of six-ft. high permanent chain link fencing and gates will be installed by a qualified subcontractor along the eastern perimeter of the site during site restoration activities. Fence materials include a fence fabric manufactured of nine-gauge galvanized steel wires, two-in. mesh and round, hot-dipped galvanized steel pipe (schedule 40), conforming to ASTM F 1083. Hole posts will be dug approximately 18-in. deep and 12-in. wide and filled with Type I Portland concrete. The concrete mix will be proportioned such that the 28-day compressive strength of moist-cured laboratory samples achieves not less than 3,000 lb/in^2. Posts will be centered and aligned three-in. above the bottom of the postholes and installed 10-ft. off center.

Gates will be installed at the discretion of the Navy and Steel Equities. If required, the gates will be installed plumb, level, and secure to ensure full opening without interference.

Installation of the fence and gates will be in accordance with Specification 32 31 13 of the Project Specifications and Drawing C-500 of the Design Drawings (Appendix B).

6.9.5 Dry Well 20-08 Restoration

Following backfilling of Dry Well 20-08 with clean fill material, additional base course approximately three-in. in thickness consisting of sand, gravel, or crushed stone will be placed within the limits of disturbance prior to asphalt placement. The proposed base course material will

meet the requirements for Graded Aggregate Base in Section 304 of the NYSDOT Standard Specifications (NYSDOT, 2018) and for Bases in ASTM D 2940.

Surface course will be placed above the base course at an approximate thickness of two-in. Asphalt cement percent by weight of total mix will be 4% to 8%. The surface course will meet the requirements for Hot Mix Asphalt Surface – Course in Section 702 of the NYSDOT Standard Specifications (NYSDOT, 2018).

Pavement tests will be performed to ensure the quality of the material and placement procedures. Variations in the binder course surface will not exceed 0.25-in. from the lower edge of the 10-ft. straightedge in areas where there are no slope changes. Irregularities greater than the above specification will be corrected. Testing will be performed at a frequency of one per 1,000-SF of base course and one per 1,000-SF of surface course placed using the Nuclear Method described in ASTM D 2950. All testing will be document on the Testing Plan and Log included as Exhibit V-1 of the PQCP (Appendix C).

Asphalt materials and installation procedures will be in accordance with Specification 32 12 16 of the Project Specifications (Appendix B).

6.9.6 Roadway Repair

Asphalt on the unnamed streets from the site to Aerospace Boulevard used during transportation and disposal activities will be repaired/repaved to meet existing conditions, if required. Asphalt repairs will be conducted in a manner to have minimal impact on traffic and will be coordinated with applicable Navy personnel, Steel Equities, and the Town of Oyster Bay.

6.10 Post-Construction Maintenance

Post-construction maintenance will be performed for a period of 30-months following completion of on-site work and final acceptance of construction activities. Site maintenance will include mowing the grass to develop grass growth, reseeding in areas with poor vegetative growth, erosion control maintenance, settlement and subsidence control, and routine fence/gate inspections and repairs. APTIM will provide NAVFAC a written notice 30-days prior to the date of intended transfer of site monitoring and maintenance responsibility.

Post-construction maintenance will be performed as detailed in Section 02 01 51 of the Project Specifications (Appendix B).

6.11 Demobilization

Demobilization will consist of decontaminating and removing all construction equipment and materials, cleaning the project site, inspecting the site, and issuing a certification of completion. Demobilization activities will also involve collection and disposal of all contaminated materials, including decontamination water and disposable equipment for which decontamination is inappropriate.

Site cleaning activities will include repair of any erosion or runoff related damage; removal of all materials such as excess construction material, wood, debris, and other foreign material; and removal of all construction equipment and storage boxes. Within 14-days after the project activities are completed, APTIM will submit a written notice to NAVFAC and schedule a pre-final inspection to determine the status of completion. During the pre-final inspection, a site-walk will be conducted to determine whether the project work is consistent with the drawings and specifications and conform to the requirements of the NYSDEC.

When determined all work is completed in accordance with the specifications and drawings, a final inspection will be conducted and additional final administrative closeout submittals will be requested.

7.0 Project Management Plan

The project management team will be responsible for all technical and administrative aspects of the site activities. Included among the team's responsibilities are the project schedule, staffing, data management, document control, project meetings, and reporting.

7.1 Key Project Personnel

Table 4 includes a list of the key project and regulatory contacts.

7.2 Document Control

APTIM's internal document control procedures will be followed for the duration of the project. Management of internal and external correspondence will be administered at the home office in Norfolk, Virginia. Document control will include assigning alphanumeric codes to each submittal. Project files will be maintained in a secure, dry area at the field office.

7.2.1 Photographic Documentation

Photographs of the site will be collected during the performance of the remedial action activities. Photographs will be taken during each feature of work in order to provide a detailed photographic history of the remedial action. Electronic versions of the photographs will be sorted by date and accompanied by a Project Photographic Log providing the date, location, and a description of the activities shown in each photo.

7.3 Meetings and Reports

Project status/contractor QC meetings will be held weekly (until otherwise determined) at the field office during the field construction activities. At a minimum, the Navy RPMs and the Project QC Manager will attend this meeting. The Project Manager, Deputy Project Manager, Construction Manager and other selected individuals will also attend these meetings with the RPM and Project QC Manager. All QC related documents and discussion are provided in the PQCP (Appendix C).

Daily reports will be prepared by the Construction Manager and the Project QC Manager and submitted to the RPM and FEAD by 1000-hours the following workday. Weekly reports will be prepared by the Project Manager and submitted to the Navy RPM and FEAD. The weekly reports will include work completed by the end of each week and work that is planned for the following week.

7.3.1 Construction Quality Control Meetings

A contractor QC meeting will be held on a weekly basis (until otherwise determined) throughout the course of fieldwork to discuss the progress of the project. At a minimum, the Navy RPM and the Project QC Manager will attend this meeting. APTIM site personnel, NWIRP Bethpage project personnel, subcontractors and vendor representatives, and Navy personnel will also attend as appropriate.

7.3.2 Health and Safety Meetings

Daily tailgate safety meetings will be held before starting work. Construction staff, including subcontractors, will attend these meetings and sign a tailgate safety meeting form. The meetings will be held by the SSHO, or his or her qualified designee, and will cover various safety issues. Any subcontractor, inspector, agency, or Navy personnel that visit the site during the course of the day will be required to review and sign the tailgate form prior to entering the work site.

7.4 Project Schedule

Project plans and field mobilization is scheduled to be completed in February 2019. Field work will be conducted from February 2019 to January 2020. Site restoration and demobilization are scheduled for February 2020. The complete schedule for Site 1 is included as Appendix A.

8.0 Reporting Requirements

Upon completion of construction activities, APTIM will prepare a CCR. The CCR will contain the site conditions and background, description of field methods and procedures, approved fieldwork variances, summary remedial action construction activities, waste characterization testing results, import fill testing results (if applicable), disposal activities and waste manifests, conclusions and recommendations, and references.

This report will specifically include the following:

- A statement that the work was conducted in accordance with the RAWP, with any exceptions noted
- Geographical Information Systems and appropriate data management requirements to load information into Navy Installation Restoration Information System
- A summary of volumes of material shipped and dispose at each location
- As-built survey of the final site conditions
- Photographs documenting the field activities
- Copies of analytical reports from characterization of soil/waste
- Copies of Manifests/Bills of Lading, and certified weight slips
- Copies of Certificates of Treatment/Disposal

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9.0 References

APTIM. 2018a. Accident Prevention Plan, Site 1 – Former Drum Marshalling Area Remedial Action for Contaminated Soil, Naval Weapons Industrial Reserve Plant, Bethpage, New York.

APTIM. 2018b. Sampling and Analysis Plan, Site 1 – Former Drum Marshalling Area Remedial Action for Contaminated Soil, Naval Weapons Industrial Reserve Plant, Bethpage, New York.

APTIM. 2018c. Stormwater Pollution Prevention Plan, Site 1 – Former Drum Marshalling Area Remedial Action for Contaminated Soil, Naval Weapons Industrial Reserve Plant, Bethpage, New York.

APTIM. 2018d. Traffic Control Plan, Site 1 – Former Drum Marshalling Area Remedial Action for Contaminated Soil, Naval Weapons Industrial Reserve Plant, Bethpage, New York.

Climate-data.org [Web Blog Post]. 2016. Climate: Farmingdale, New York. Retrieved December 15, 2016 from http://en.climate-data.org 2016.

NAVFAC, 2012. UFGS Section 01 35 26 Governmental Safety Requirements.

Navy. 2018. Record of Decision Operable Unit 4 Naval Weapons Industrial Reserve Plant, Bethpage, New York.

NYSDEC, 1995. Record of Decision Operable Unit 1 NWIRP Bethpage, NY. March

NYSDEC, 2009. CP-43: Groundwater Monitoring Well Decommissioning Policy. November.

NYSDEC, 2010. DER-10, Technical Guidance for Site Investigation and Remediation. May.

NYSDOT, 2018. Standard Specifications (US Customary Units) Construction and Materials. September.

OSHA, 2010. 29 CFR 1926 Construction Industry Regulations Subpart P, Appendix B. January.

Resolution, 2016. Resolution Consultants, Bethpage Water District Well 6-2 Pilot Test Report.

Tetra Tech, Inc. 2019. Final Remedial Design for Site 1 – Former Drum Marshalling Area, Naval Weapons Industrial Reserve Plant, Bethpage, New York.

USACE, 2014. Safety and Health Requirements Manual EM 385-1-1.

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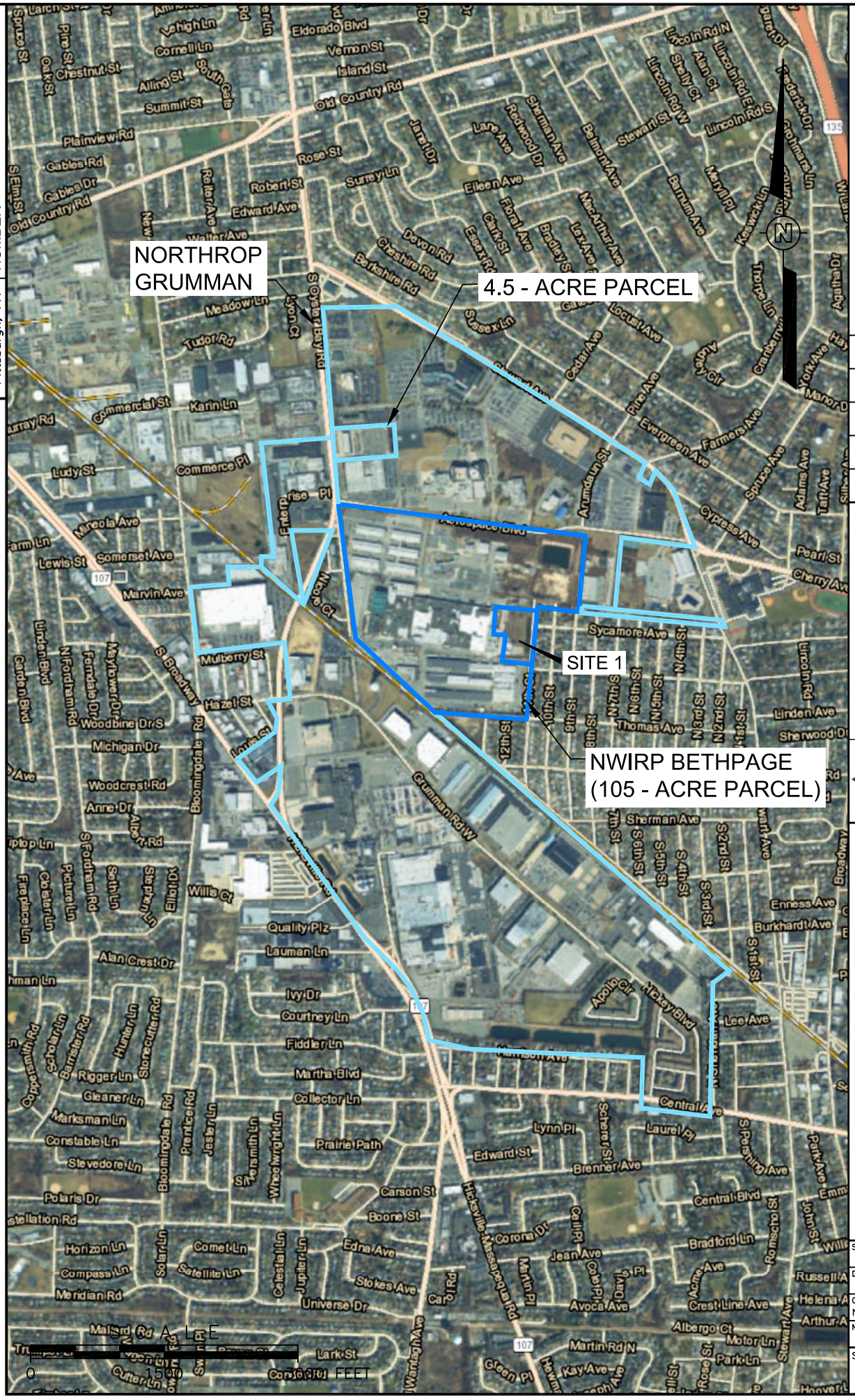
Figures



OFFICE: Pittsburgh, PA

DRAWING NUMBER: 501164-A1

REVISIONS

REV	DATE	BY	CHK'D	APP'VD	DESCRIPTION/ISSUE

APTIM Federal Services, LLC
150 Boush Street, Suite 701
Norfolk, Virginia 23510

DESIGNED BY	DATE	CHECKED BY	DATE
M. Smith	8/27/18		
DRAWN BY	DATE	APPROVED BY	DATE
B. O'Connor	8/27/18		

NAVFAC Naval Facilities Engineering Command MID-ATLANTIC

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK
SITE 1 - FORMER DRUM MARSHALLING AREA
SITE LOCATION MAP

SCALE:	SIZE:
AS SHOWN	A

DELIVERY ORDER NO. F6147

CONSTR. CONTRACT NO. N62470-16-D-9004

NAVFAC DRAWING NO. --

SHEET I.D.

FIGURE 2

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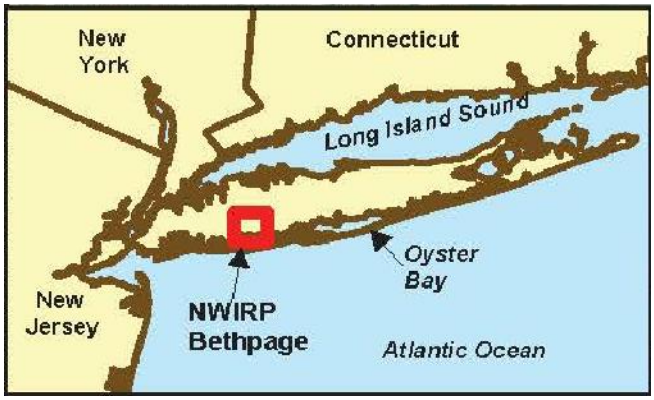
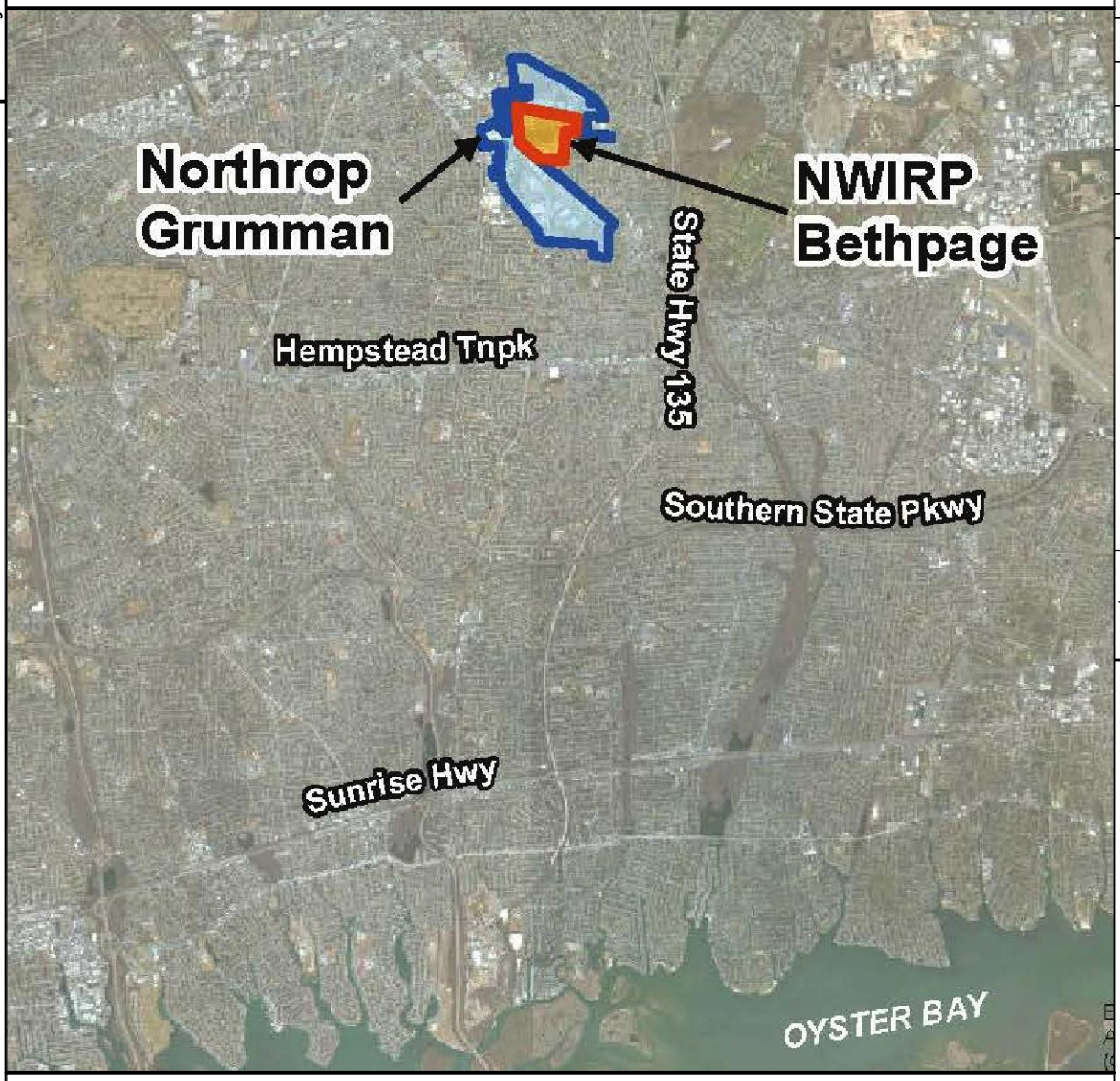
Plotted By: bernadette.oconnor





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SCALE

0 8,000 16,000 FEET

OFFICE: Pittsburgh, PA

DRAWING NUMBER: 501164-A1

REVISIONS

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

APTIM Federal Services, LLC
150 Boush Street, Suite 701
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DESIGNED BY	DATE	CHECKED BY	DATE
M. Smith	8/6/18		
DRAWN BY	DATE	APPROVED BY	DATE
B. O'Connor	8/6/18		

NAVFAC Naval Facilities Engineering Command MID-ATLANTIC

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK
SITE 1 - FORMER DRUM MARSHALLING AREA

GENERAL LOCATION MAP

SCALE:	SIZE:
AS SHOWN	A

DELIVERY ORDER NO. F6147

CONSTR. CONTRACT NO. N62470-16-D-9004

NAVFAC DRAWING NO. --

SHEET I.D.

FIGURE 1

Xref :
Image : APTIM Logo Standard Color.jpg
Figure 1 General Location Map.jpg
Figure 2 Site Location Map.jpg
Figure 3 Site Layout Plan.jpg
Figure 4 Traffic Plan.jpg
Figure 5 Excavation Depths.jpg
N90845_002083 Proposed Plan Regarding Site 1, Soil, Soil Vapor and Shallow 2018-1101.jpg
NAVFAC Logo.jpg

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Plotted By: bernadette.oconnor
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NAVFAC Logo.jpg

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Pittsburgh, PA	501164-B1

LEGEND:
- PHASE I LIMIT
- EXCLUSION ZONE
- DECONTAMINATION ZONE
- HAUL ROAD
- PAVEMENT
- GRAVEL AREA

CONSTRUCTION TRAILERS
PORTABLE STORAGE TANK
SCALE
TRUCK DECONTAMINATION PAD
HAUL ROAD
HAUL ROAD
EXCAVATED MATERIAL STOCKPILE AREA
HAUL ROAD
ASPHALT
PHASE I

SCALE
0 60 120 180 FEET

FIGURE 3

SHEET I.D.: --
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F6147
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B

NAVFAC Naval Facilities Engineering Command MID-ATLANTIC

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK
SITE 1 - FORMER DRUM MARSHALLING AREA
SITE PLAN PHASE I

APTIM

APTIM Federal Services, LLC
150 Boush Street, Suite 701
Norfolk, Virginia 23510

DESIGNED BY	DATE	CHECKED BY	DATE
A. Reyes	*5/22/19*		
DRAWN BY	DATE	APPROVED BY	DATE
B. O'Connor	*5/22/19*		

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

REVISIONS

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Plotted By: bernadette.oconnor
Xref:
Image: APTIM Logo Standard Color.jpg
NAVFAC Logo.jpg

OFFICE	DRAWING NUMBER
Pittsburgh, PA	501164-B1

LEGEND:
- PHASE II LIMIT
- EXCLUSION ZONE
- DECONTAMINATION ZONE
- STEEL SHEET PILE
- HAUL ROAD
- PAVEMENT
- GRAVEL AREA

CONSTRUCTION TRAILERS
PORTABLE STORAGE TANK
SCALE
TRUCK DECONTAMINATION PAD
HAUL ROAD
SHEET PILE
PHASE IIB
HAUL ROAD
HAUL ROAD
CLEAN FILL
HAUL ROAD
EXCAVATED MATERIAL STOCKPILE AREA
SHEET PILE
PHASE IIA
ASPHALT

SCALE
0 60 120 180 FEET

FIGURE 4
SHEET I.D.: --
N62470-16-D-9004
F6147
AS SHOWN
B

NAVFAC Naval Facilities Engineering Command MID-ATLANTIC
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK
SITE 1 - FORMER DRUM MARSHALLING AREA
SITE PLAN PHASE II

APTIM
APTIM Federal Services, LLC
150 Boush Street, Suite 701
Norfolk, Virginia 23510

DESIGNED BY	DATE	CHECKED BY	DATE
W. Deane	2/12/19		
DRAWN BY	DATE	APPROVED BY	DATE
B. O'Connor	2/12/19		

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

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Plotted By: bernadette.oconnor
Xref:
Image: APTIM Logo Standard Color.jpg
NAVFAC Logo.jpg

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Pittsburgh, PA	501164-B1

LEGEND:
- PHASE III LIMIT
- EXCLUSION ZONE
- DECONTAMINATION ZONE
- STEEL SHEET PILE
- HAUL ROAD
- PAVEMENT
- GRAVEL AREA

CONSTRUCTION TRAILERS
PORTABLE STORAGE TANK
PHASE III
SCALE
TRUCK DECONTAMINATION PAD
SHEET PILE
HAUL ROAD
EXCAVATED MATERIAL STOCKPILE AREA
PHASE III
CLEAN FILL HAUL ROAD
SHEET PILE
CLEAN FILL
ASPHALT

SCALE
0 60 120 180 FEET

FIGURE 5
SHEET I.D.: --
N62470-16-D-9004
F6147
AS SHOWN
B

NAVFAC Naval Facilities Engineering Command MID-ATLANTIC
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK
SITE 1 - FORMER DRUM MARSHALLING AREA
SITE PLAN PHASE III

APTIM
APTIM Federal Services, LLC
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Norfolk, Virginia 23510

DESIGNED BY	DATE	CHECKED BY	DATE
W. Deane	2/12/19		
DRAWN BY	DATE	APPROVED BY	DATE
B. O'Connor	2/12/19		

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

REVISIONS

OFFICE Pittsburgh, PA

DRAWING NUMBER 501164-A1

CONSTRUCTION TRAILERS

PORTABLE STORAGE TANK

TRUCK DECONTAMINATION PAD

SCALE

EQUIPMENT AND MATERIALS STORAGE AREA

DRY WELL 20-08

PLANT No. 3

11TH STREET

SYCAMORE AVE

PIEZ

PIEZ

PIEZ

LEGEND:

- SITE BOUNDARIES
- FENCELINE
- TEMPORARY CONCRETE BARRIERS AND CHAIN LINK FENCE PANELS ALONG CURB
- STEEL SHEET PILE
- PAVEMENT
- GRAVEL AREA
- CESSPOOL LOCATION
- PIEZ PIEZOMETER LOCATION
- GROUNDWATER MONITORING WELLS
- 0-2 FT EXCAVATION LIMIT
- 0-10 FT EXCAVATION LIMIT
- 10-20 FT EXCAVATION LIMIT
- 20-30 FT EXCAVATION LIMIT

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SCALE
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REVISIONS

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

APTIM Federal Services, LLC
150 Boush Street, Suite 701
Norfolk, Virginia 23510

DESIGNED BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
M. Smith	8/28/18				8/28/18

DRAWN BY B. O'Connor

NAVFAC Naval Facilities Engineering Command

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK
SITE 1 - FORMER DRUM MARSHALLING AREA
EXCAVATION PHASES AND DEPTHS

SCALE: AS SHOWN
SIZE: B
DELIVERY ORDER NO. F6147
CONSTR. CONTRACT NO. N62470-16-D-9004
NAVFAC DRAWING NO. --
SHEET I.D. **FIGURE 6**

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Tables

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Table 1
Excavation Volumes

Material Type	Phase I	Phase IIA	Phase IIB	Phase III
Total Clean Overburden	1,666 CY	14,483 CY	6,974 CY	13,119 CY
0’ – 2’ Contaminated	4,434 CY	5,591 CY	--	3,896 CY
2’ – 10’ Contaminated	--	8,591 CY	--	1,895 CY
10’ – 20’ Contaminated	--	3,688 CY	--	4,065 CY
20’ – 30’ Contaminated	--	--	3,487 CY	--
Total Excavated	6,100 CY	32,352 CY	10,461 CY	22,975 CY

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Table 2

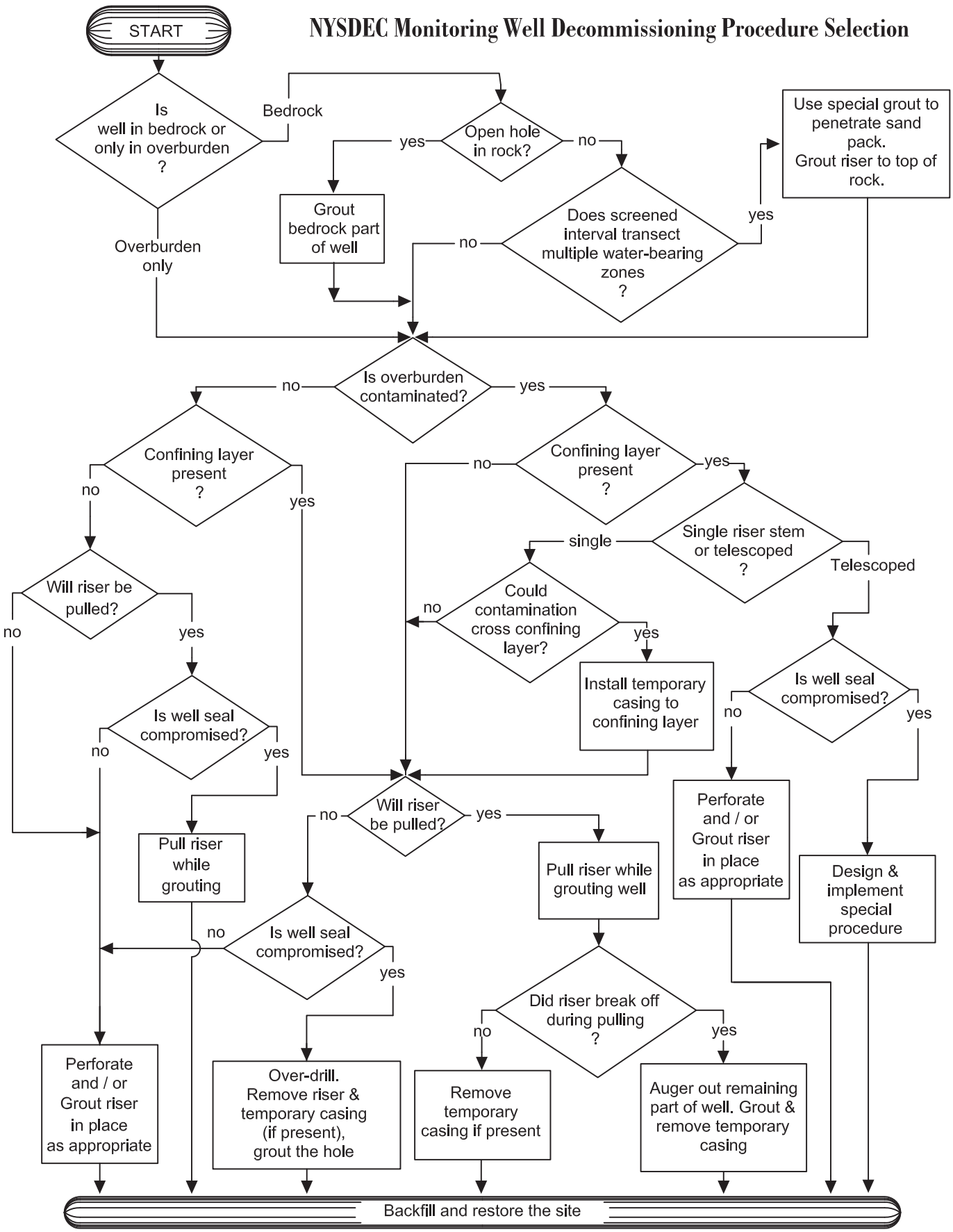
START
NYSDEC Monitoring Well Decommissioning Procedure Selection
Is well in bedrock or only in overburden ?
Bedrock
Overburden only
Open hole in rock?
yes
no
Grout bedrock part of well
Does screened interval transect multiple water-bearing zones ?
yes
no
Use special grout to penetrate sand pack. Grout riser to top of rock.
Is overburden contaminated?
no
yes
Confining layer present ?
no
yes
Will riser be pulled?
no
yes
Is well seal compromised?
no
yes
Pull riser while grouting
Confining layer present ?
no
yes
Single riser stem or telescoped ?
single
Telescoped
Could contamination cross confining layer?
no
yes
Install temporary casing to confining layer
Is well seal compromised?
no
yes
Will riser be pulled?
no
yes
Pull riser while grouting well
Perforate and / or Grout riser in place as appropriate
Design & implement special procedure
Is well seal compromised?
no
yes
Did riser break off during pulling ?
no
yes
Perforate and / or Grout riser in place as appropriate
Over-drill. Remove riser & temporary casing (if present), grout the hole
Remove temporary casing if present
Auger out remaining part of well. Grout & remove temporary casing
Backfill and restore the site

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Table 3
Anticipated Waste Streams and Volumes

Waste Type	Anticipated Volume
Concrete Debris	200-CY
Vegetative Debris	2 40-CY roll-offs
Metals Recycling	5-Tons
Asphalt Recycling	460-CY
Non-Hazardous Soil	31, 947-Tons
TSCA Hazardous	15,521-Tons
RCRA Hazardous	2,512-Tons
Decontamination Water	30,000-Gallons

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Table 4
Key Project Personnel

Agency	Contact	Project Title
NAVFAC Mid-Atlantic 1510 Gilbert Street Building N26 Norfolk, Virginia 23511	Brian S. Murray 757.341.0491 Brian.s.murray@navy.mil	Navy Remedial Project Manager
New London Public Works Naval Submarine Base New London PWD EV, Room 104 439 Tautog Avenue, Box 400 Groton, Connecticut 06349	TBN 860.694.5649	Department Support Construction Manager
NAVFAC Mid-Atlantic 1510 Gilbert Street Building N26 Norfolk, Virginia 23511	Crystal Godwin 757.341.1980 Crystal.godwin@navy.mil	Contracting Officer
NAVFAC Mid-Atlantic 1510 Gilbert Street Building N26 Norfolk, Virginia 23511	Brett Garnett 757.341.1986 Brett.garnett@navy.mil	Contract Specialist
CH2M Hill 5701 Cleveland Street, Suite 200 Virginia Beach, Virginia 23462	Monica Marrow 757.671.6213 adminrec@ch2m.com	Navy Installation Restoration Information System Representative
Division of Environmental Remediation New York State Department of Environmental Conservation 625 Broadway Albany, New York 12233	Jason Pelton 518.402.9478 Jason.pelton@dec.ny.gov	New York State Department of Environmental Conservation Project Manager
APTIM 150 Boush Street, Suite 701 Norfolk, Virginia 23510	William L. Deane, Jr., PE 757.640.6956 (office) 973.615.6635 (mobile) william.deane@aptim.com	Program Manager
APTIM 150 Boush Street, Suite 701 Norfolk, Virginia 23510	Monica L. Smeal 757.640.6943 (office) 757.390-6043 (mobile) monica.smeal@aptim.com	Deputy Project Manager
APTIM 150 Boush Street, Suite 701 Norfolk, Virginia 23510	Timothy Collins 410.409.7307 timothy.collins@aptim.com	Construction Manager
APTIM 150 Boush Street, Suite 701 Norfolk, Virginia 23510	Natasha Sullivan 410.529.7598 (office) 410.804.5642 (mobile) natasha.sullivan@aptim.com	Program Chemist

Table 4 (continued)
Key Project Personnel

Agency	Contact	Project Title
APTIM 500 Penn Center Boulevard, Suite 900 Pittsburg, Pennsylvania 15235	Bill Squire, P.G. 412.858.1638 (office) 412.736.0930 (mobile) william.squire@aptim.com	Program QC Manager
APTIM 150 Boush Street, Suite 701 Norfolk, Virginia 23510	Monica L. Smeal 757.640.6943 (office) 757.390.6043 (mobile) monica.smeal@aptim.com	Project QC Manager
APTIM 16380 U.S. Route 224 East, Suite 100 Findlay, OH 45840	David Mummert 419.429.5509 (office) 419.348.1544 (mobile) david.mummert@aptim.com	CIH
APTIM 150 Boush Street, Suite 701 Norfolk, Virginia 23510	TBN	SSHO

Notes:

CIH	*Certified Industrial Hygienist*
SSHO	*Site Safety and Health Officer*
TBN	*To be named*
QC	*Quality Control*

Appendix A
Project Schedule

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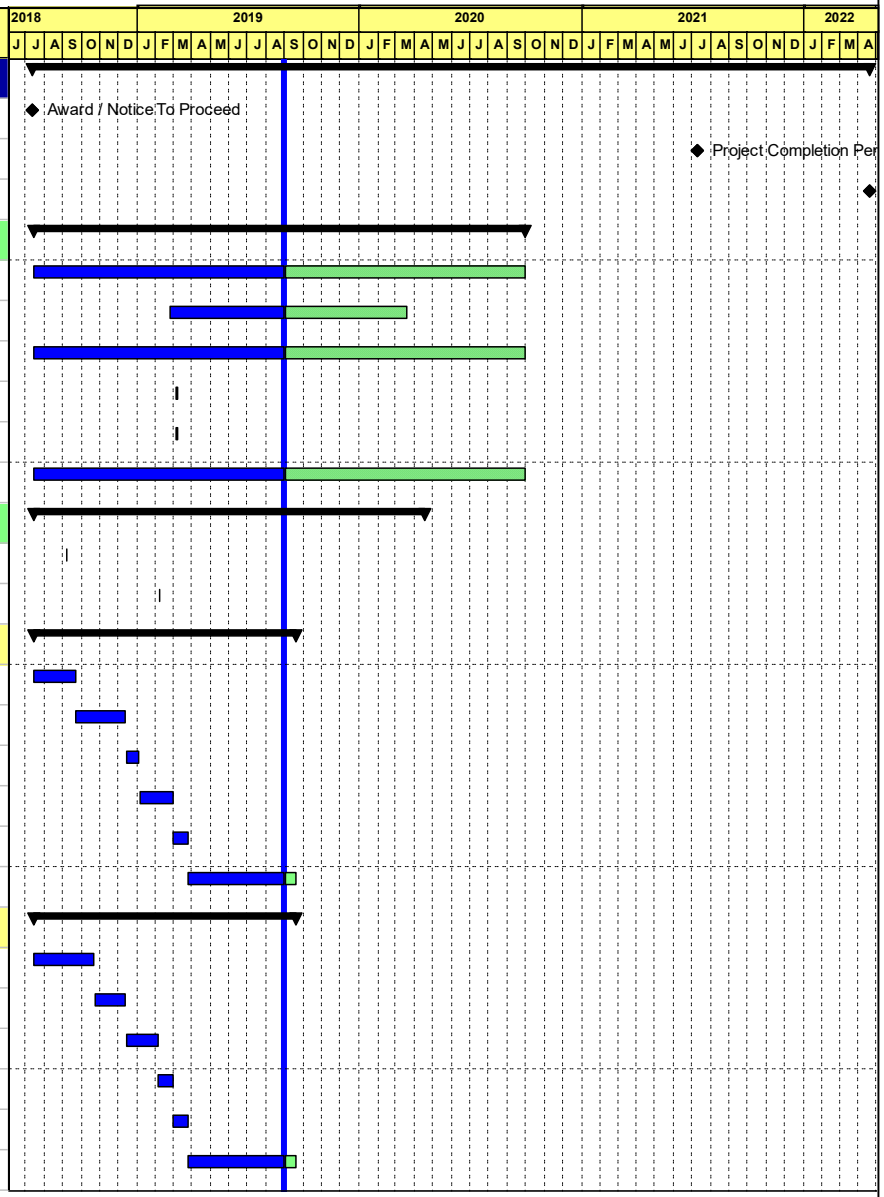
F6147: Site 1 - RA for Contaminated Soil NWIRP, Bethpage NY

Activity ID	Activity Name	OD	Rem Dur	Start	Finish
F6147: Site 1 - RA for Contaminated Soil NWIRP, Bethpage NY		1374	962	12-Jul-18 A	19-Apr-22
331000	Award / Notice To Proceed	0	0	12-Jul-18 A	
331010	Project Completion Per PWS	0	0		10-Jul-21
331020	Project Completion Per Schedule	0	0		19-Apr-22
WE01: Project Management, Administrative Support, and Meetings		713	395	15-Jul-18 A	29-Sep-20
31221000	Project Management	713	395	15-Jul-18 A	29-Sep-20
31222000	Field Supervision	375	202	25-Feb-19 A	20-Mar-20
31223000	Project Meetings & Public Affairs	713	395	15-Jul-18 A	29-Sep-20
31223010	Preconstruction Meeting - Navy	1	0	07-Mar-19 A	07-Mar-19 A
31223020	Preconstruction Meeting - TOB	1	0	07-Mar-19 A	07-Mar-19 A
31223030	RAB Meetings	713	395	15-Jul-18 A	29-Sep-20
WE02: Plans and Preconstruction Activities		642	230	15-Jul-18 A	17-Apr-20
310103	NYDEC Approval of Basis of Design	1	0	06-Sep-18 A	06-Sep-18 A
31010305	Site Visit	1	0	07-Feb-19 A	07-Feb-19 A
Remedial Action Work Plan		253	20	15-Jul-18 A	20-Sep-19
31010310	Draft RAWP	46	0	15-Jul-18 A	21-Sep-18 A
31010311	NAVFAC Review Draft RAWP	30	0	22-Sep-18 A	13-Dec-18 A
31010312	Response To Comments / Submit Draft Final RAWP	15	0	14-Dec-18 A	04-Jan-19 A
31010313	NYSDEC Review Draft Final RAWP	30	0	05-Jan-19 A	28-Feb-19 A
31010317	Response to NYSDEC Comments Draft Final RAWP	10	0	01-Mar-19 A	25-Mar-19 A
31010318	Submit Final RAWP	5	20	26-Mar-19 A	20-Sep-19
Sampling and Analysis Plan		253	20	15-Jul-18 A	20-Sep-19
31010320	Draft SAP	46	0	15-Jul-18 A	22-Oct-18 A
31010321	NAVFAC Review Draft SAP	21	0	23-Oct-18 A	13-Dec-18 A
31010322	Response To Comments / Submit Draft Final SAP	25	0	14-Dec-18 A	04-Feb-19 A
31010323	NYSDEC Review Draft Final SAP	3	0	05-Feb-19 A	28-Feb-19 A
31010327	Response to NYSDEC Comments Draft Final SAP	10	0	01-Mar-19 A	25-Mar-19 A
31010328	Submit Final SAP	5	20	26-Mar-19 A	20-Sep-19

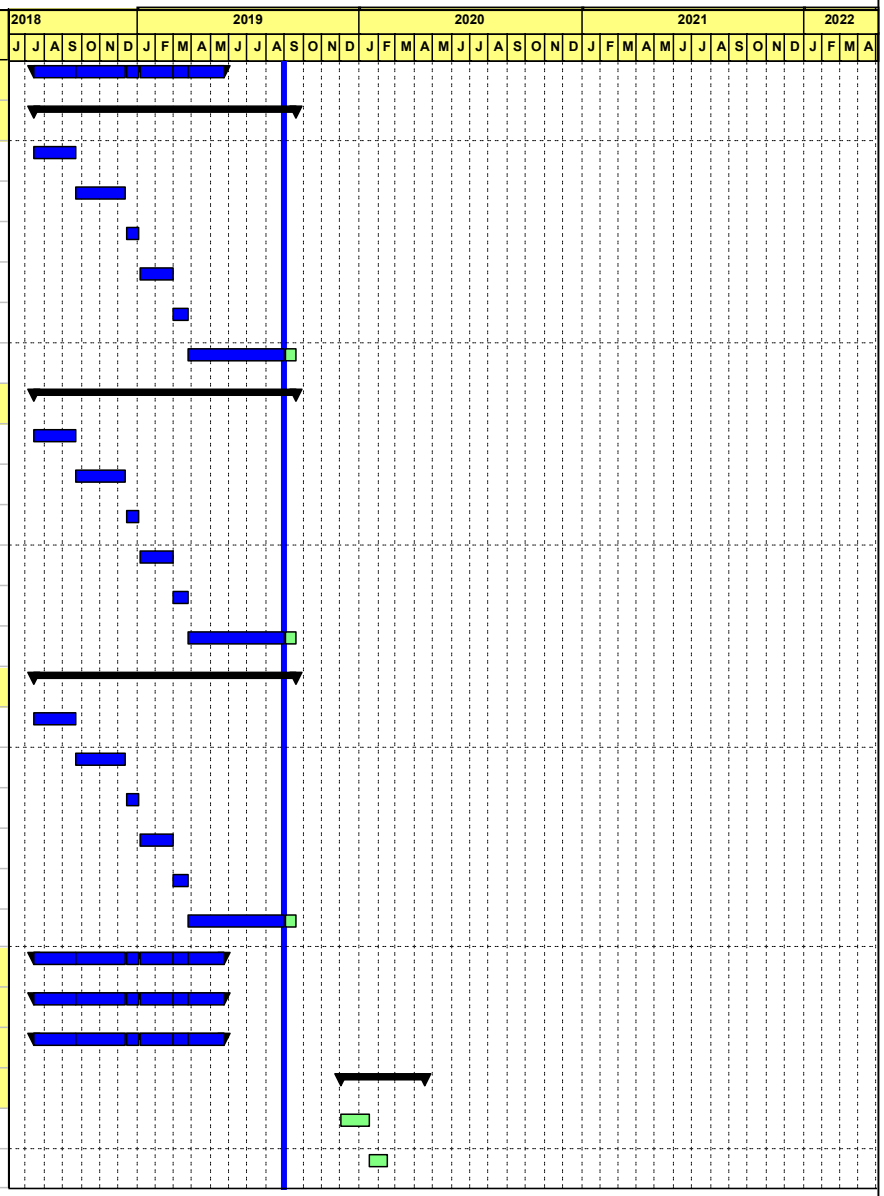


Remaining Level of Effort
Actual Level of Effort
WBS Summary
Actual Work
Remaining Work
Critical Remain...

Data Date: 31-Aug-19

F6147: Site 1 - RA for Contaminated Soil NWIRP, Bethpage NY

Activity ID	Activity Name	OD	Rem Dur	Start	Finish
Health and Safety Plan		253	0	15-Jul-18 A	23-May-19 A
Waste Management Plan		253	20	15-Jul-18 A	20-Sep-19
31010340	Draft WMP	46	0	15-Jul-18 A	21-Sep-18 A
31010341	NAVFAC Review Draft WMP	30	0	22-Sep-18 A	13-Dec-18 A
31010342	Response To Comments / Submit Draft Final WMP	15	0	14-Dec-18 A	04-Jan-19 A
31010343	NYSDEC Review Draft Final WMP	20	0	05-Jan-19 A	28-Feb-19 A
31010347	Response to NYSDEC Comments Draft Final WMP	10	0	01-Mar-19 A	25-Mar-19 A
31010348	Submit Final WMP	5	20	26-Mar-19 A	20-Sep-19
Construction Daily Control Plan		253	20	15-Jul-18 A	20-Sep-19
31010350	Draft CDCP	46	0	15-Jul-18 A	21-Sep-18 A
31010351	NAVFAC Review Draft CDCP	30	0	22-Sep-18 A	13-Dec-18 A
31010352	Response To Comments / Submit Final Draft CDCP	15	0	14-Dec-18 A	04-Jan-19 A
31010353	NYSDEC Review Draft Final CDCP	20	0	05-Jan-19 A	28-Feb-19 A
31010357	Response to NYSDEC Comments Draft Final CDCP	10	0	01-Mar-19 A	25-Mar-19 A
31010358	Submit Final CDCP	5	20	26-Mar-19 A	20-Sep-19
Environmental Protection Plan		250	20	15-Jul-18 A	20-Sep-19
31010360	Draft EPP	46	0	15-Jul-18 A	21-Sep-18 A
31010361	NAVFAC Review Draft EPP	30	0	22-Sep-18 A	13-Dec-18 A
31010362	Response To Comments / Submit Draft Final EPP	15	0	14-Dec-18 A	04-Jan-19 A
31010363	NYSDEC Review Draft Final EPP	20	0	05-Jan-19 A	28-Feb-19 A
31010367	Response to NYSDEC Comments Draft Final EPP	10	0	01-Mar-19 A	25-Mar-19 A
31010368	Submit Final EPP	5	20	26-Mar-19 A	20-Sep-19
Storm Water Polution Prevention Plan		250	0	15-Jul-18 A	23-May-19 A
Traffic Plan		245	0	15-Jul-18 A	23-May-19 A
Site Plan		250	0	15-Jul-18 A	23-May-19 A
Operation and Maintenance Plan - Post Construction		136	136	03-Dec-19	17-Apr-20
310103951	Internal Draft O&M Plan	46	46	03-Dec-19	18-Jan-20
310103952	NAVFAC Review Internal Draft O&M Plan	30	30	18-Jan-20*	17-Feb-20



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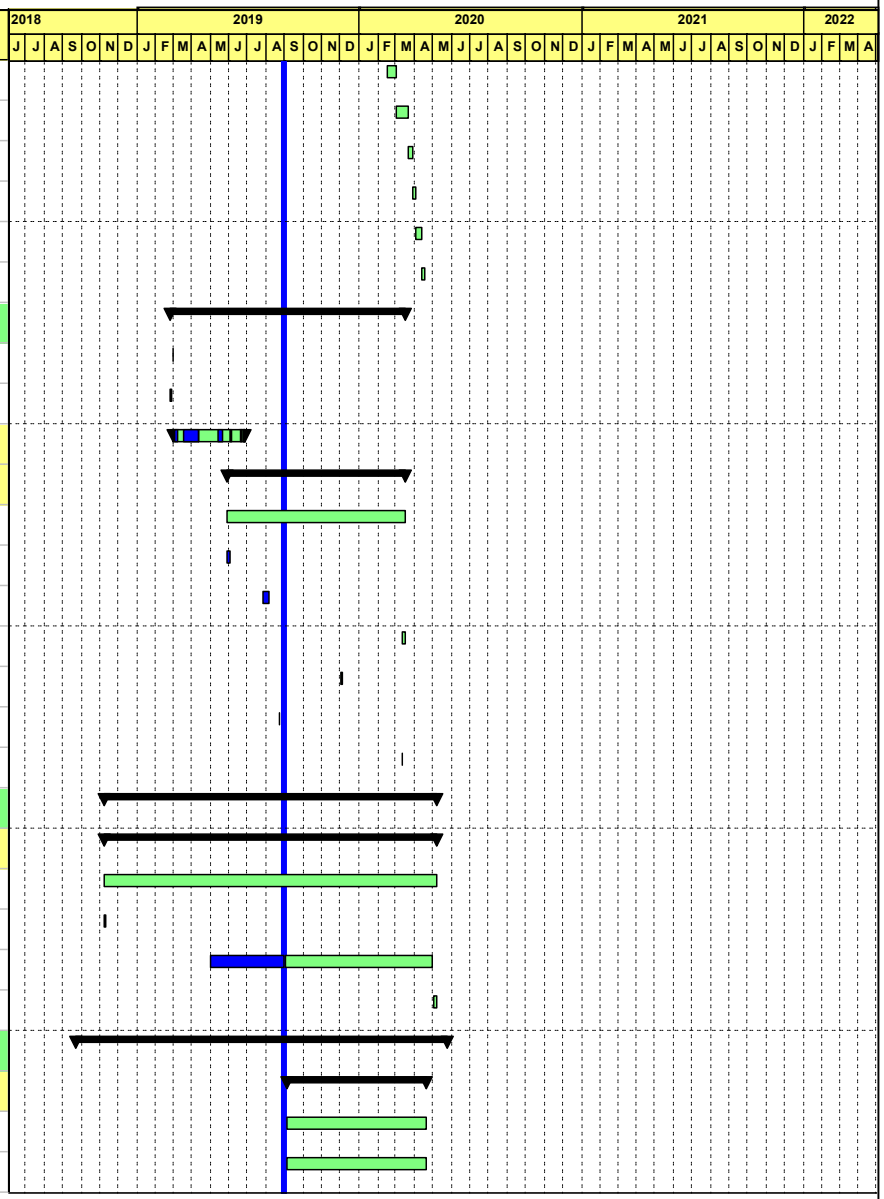
Critical Remain...

Data Date: 31-Aug-19

F6147: Site 1 - RA for Contaminated Soil NWIRP, Bethpage NY

Activity ID	Activity Name	OD	Rem Dur	Start	Finish
310103953	Response To Comments / Submit Draft O&M Plan	15	15	17-Feb-20	03-Mar-20
310103954	NYSDEC Review Draft O&M Plan	20	20	03-Mar-20	23-Mar-20
310103955	Response To Comments / Submit Draft Final O&M Plan	5	5	23-Mar-20	28-Mar-20
310103956	Regulatory Review Draft O&M Plan	5	5	28-Mar-20	02-Apr-20
310103957	Response to NYSDEC Comments Draft O&M Plan	10	10	02-Apr-20	12-Apr-20
310103958	Submit Final O&M Plan	5	5	12-Apr-20	17-Apr-20
WE03: Mobilization and Setup Activities		391	107	25-Feb-19 A	18-Mar-20
3101	Navy Notice to Mobilize	1	0	28-Feb-19 A	28-Feb-19 A
31010200	Mobilization or Personnel	2	0	25-Feb-19 A	26-Feb-19 A
Site Setup / Temporary Construction Facilities		120	0	28-Feb-19 A	26-Jun-19 A
Utility Relocation		304	107	29-May-19 A	18-Mar-20
31010600	Utility Relocation	218	77	29-May-19 A	18-Mar-20
31010610	Gas Line Relocation	2	0	29-May-19 A	03-Jun-19 A
31010620	Storm Sewer (Phase I)	5	0	26-Jul-19 A	06-Aug-19 A
31010630	Storm Sewer (Phase II)	4	4	12-Mar-20	18-Mar-20
31010660	Abandonment Force Main	1	1	03-Dec-19	03-Dec-19
31010680	Permanent Northern Water Line Relocation	1	0	23-Aug-19 A	23-Aug-19 A
31010690	Drywell Water Line Relocation	1	1	12-Mar-20	13-Mar-20
WE04: Permits and Surveys		330	180	07-Nov-18 A	08-May-20
Surveys		330	180	07-Nov-18 A	08-May-20
31013000	Surveying	330	180	07-Nov-18 A	08-May-20
31013010	Initial Topo & Excavation Layout	2	0	07-Nov-18 A	09-Nov-18 A
31013020	Excavation Verification Survey	262	175	02-May-19 A	01-May-20
31013030	Final As-Built Survey	5	5	04-May-20	08-May-20
WE05: Remedy Implementation		577	267	21-Sep-18 A	25-May-20
Truck Scale Operation		164	164	04-Sep-19	20-Apr-20
31080000	Truck Scale Operation	164	164	04-Sep-19	20-Apr-20
31080010	Truck Scale O&M - Personnel / ODCs	164	164	04-Sep-19	20-Apr-20



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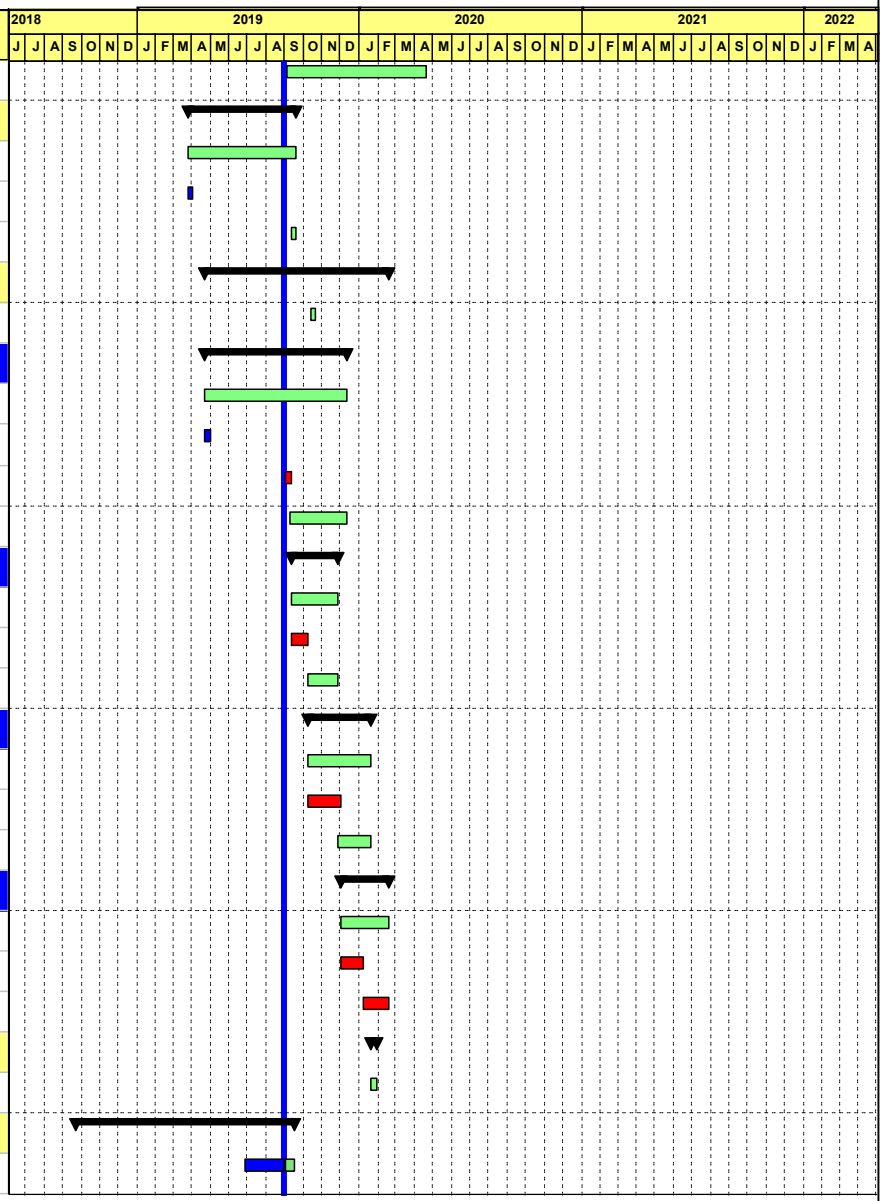
F6147: Site 1 - RA for Contaminated Soil NWIRP, Bethpage NY

Activity ID	Activity Name	OD	Rem Dur	Start	Finish
31080020	Scale Shack	164	164	04-Sep-19	20-Apr-20
Site Clearing		118	5	27-Mar-19 A	18-Sep-19
31030200	Site Clearing	118	5	27-Mar-19 A	18-Sep-19
31030210	Clearing / Grubbing Phase I	5	0	27-Mar-19 A	02-Apr-19 A
31030220	Clearing / Grubbing Phase II (Perimeter Trees)	5	5	12-Sep-19	18-Sep-19
Excavation & Fill		303	170	23-Apr-19 A	19-Feb-20
310801	Overburden Excavation	6	6	14-Oct-19*	21-Oct-19
Excavate 0-2 Feet		233	100	23-Apr-19 A	11-Dec-19
31080100	Excavate 0-2 Feet	167	72	23-Apr-19 A	11-Dec-19
31080101	Excavate Southern Phase (Phase I)	6	0	23-Apr-19 A	02-May-19 A
31080102	Excavate Central Phase (Phase IIA)	8	8	03-Sep-19	12-Sep-19
31080103	Excavate Northern Phase (Phase III)	67	67	10-Sep-19	11-Dec-19
Excavate 2-10 Feet		75	75	13-Sep-19	26-Nov-19
31080110	Excavate 2-10 Feet	53	53	13-Sep-19	26-Nov-19
31080111	Excavate Central Phase (Phase IIA)	18	18	13-Sep-19	08-Oct-19
31080112	Excavate Northern Phase (Phase III)	35	35	09-Oct-19	26-Nov-19
Excavate 10-20 Feet		105	105	09-Oct-19	21-Jan-20
31080120	Excavate 10-20 Feet	75	75	09-Oct-19	21-Jan-20
31080121	Excavate Central Phase (Phase IIA)	36	36	09-Oct-19	02-Dec-19
31080122	Excavate Northern Phase (Phase III)	40	40	27-Nov-19	21-Jan-20
Excavate Drywell 20-08 Area		79	79	03-Dec-19	19-Feb-20
31080130	Excavate Drywell 20-08 Area	57	57	03-Dec-19	19-Feb-20
31080131	Excavate Phase IIB (Clean Phase)	24	24	03-Dec-19	07-Jan-20
31080132	Excavate Phase IIB (Dirty Phase)	35	35	07-Jan-20	19-Feb-20
Geosynthetic Clay Liner		6	6	21-Jan-20	29-Jan-20
31080500	Geosynthetic Clay Liner Installation	6	6	21-Jan-20	29-Jan-20
Sheet Piling		364	15	21-Sep-18 A	16-Sep-19
31081000	Sheet Piling	60	11	28-Jun-19 A	16-Sep-19



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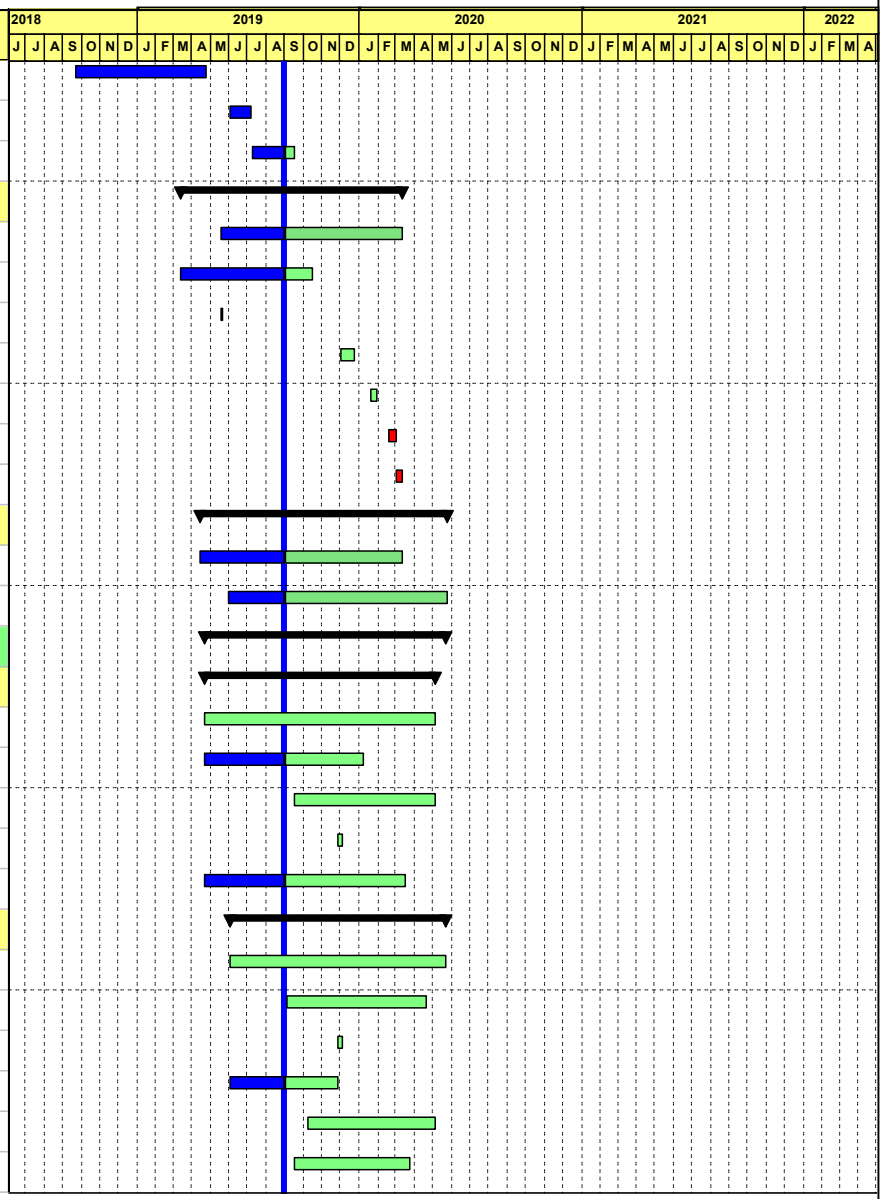
F6147: Site 1 - RA for Contaminated Soil NWIRP, Bethpage NY

Activity ID	Activity Name	OD	Rem Dur	Start	Finish
31081010	Shoring Plan	0	0	21-Sep-18 A	25-Apr-19 A
31081020	Installation of Sheet Piling 20' Area	30	0	03-Jun-19 A	08-Jul-19 A
31081035	Installation of Sheet Piling Dry Well Area	50	11	09-Jul-19 A	16-Sep-19
Backfilling		262	139	13-Mar-19 A	12-Mar-20
31081500	Backfilling	156	139	20-May-19 A	12-Mar-20
31081520	Clean Fill Sampling	133	32	13-Mar-19 A	15-Oct-19
31081530	Phase I	11	0	20-May-19 A	22-May-19 A
31081540	Phase II	16	16	03-Dec-19	24-Dec-19
31081550	Phase III	6	6	21-Jan-20	29-Jan-20
31081560	Phase IV	8	8	19-Feb-20	02-Mar-20
31081570	Phase V	8	8	02-Mar-20	12-Mar-20
Erosion Control		255	191	15-Apr-19 A	25-May-20
31082000	Erosion Control	185	139	15-Apr-19 A	12-Mar-20
31082010	Work Zone Traffic Control	184	191	31-May-19 A	25-May-20
WE06: Transport and Disposal of Material		284	190	23-Apr-19 A	22-May-20
Waste Characterization Sampling		272	178	23-Apr-19 A	06-May-20
31190000	Waste Characterization Sampling	272	178	23-Apr-19 A	06-May-20
31190020	Disposal Sampling - Soil	165	93	23-Apr-19 A	08-Jan-20
31190030	Disposal Sampling - Water	168	168	16-Sep-19	06-May-20
31190040	Disposal Sampling - Concrete Wipe Samples	6	6	27-Nov-19	04-Dec-19
31190050	Data Management / Analysis	190	141	23-Apr-19 A	16-Mar-20
Waste Handling, Transport and Disposal		255	190	03-Jun-19 A	22-May-20
31190010	Waste Handling, Transport & Disposal	255	190	03-Jun-19 A	22-May-20
31190060	Waste Handling Process	164	164	04-Sep-19	20-Apr-20
31190070	Concrete Disposal	6	6	27-Nov-19	04-Dec-19
31190080	Vegetative Debris	105	62	03-Jun-19 A	26-Nov-19
31190090	Water Disposal	150	150	10-Oct-19	06-May-20
31190100	Metal Recycling	138	138	16-Sep-19	25-Mar-20



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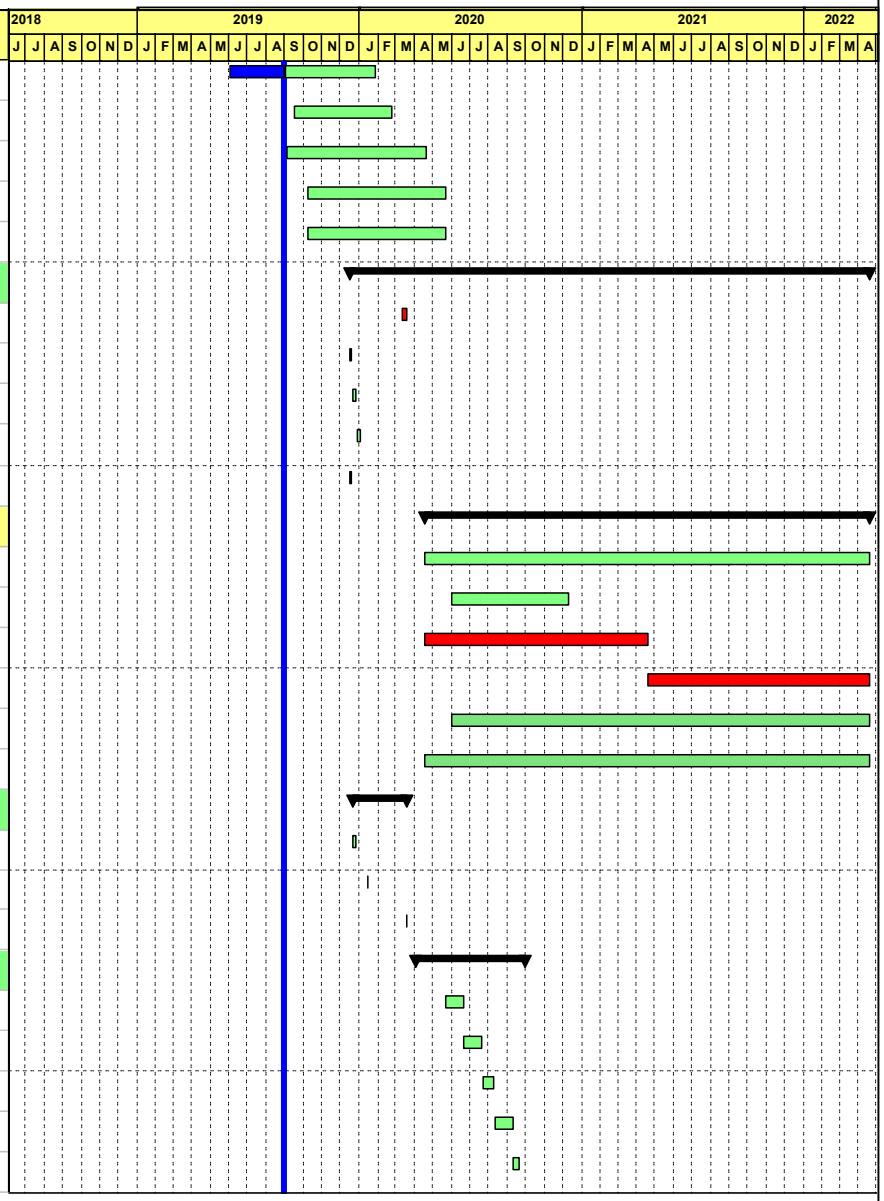
F6147: Site 1 - RA for Contaminated Soil NWIRP, Bethpage NY

Activity ID	Activity Name	OD	Rem Dur	Start	Finish
31190110	CD Disposal	150	107	03-Jun-19 A	28-Jan-20
31190120	Asphalt Recycling	116	116	16-Sep-19	24-Feb-20
31190130	Non-Hazardous Waste	164	164	04-Sep-19	20-Apr-20
31190140	TSCA PCB Waste	164	164	08-Oct-19	22-May-20
31190150	TSCA PCB/RCRA Metals Waste	164	164	08-Oct-19	22-May-20
WE07: Site Restoration		612	612	16-Dec-19	19-Apr-22
31200410	Seeding for Grass Estabilishment (Hydroseeding)	5	5	12-Mar-20	19-Mar-20
31200420	Trees & Tree Planting	5	5	16-Dec-19	20-Dec-19
31200430	Site Fencing & Installation	5	5	23-Dec-19	27-Dec-19
31200440	Haul Road Restoration (Stone Recycling, Removal & Restoration)	5	5	30-Dec-19	03-Jan-20
31201000	Bituminous Concrete Pavement & Aggregate Surfacing (Base Course Install, Binder Course & Surface Course)	5	5	16-Dec-19	20-Dec-19
Operation & Maintenance of Remedy		522	522	17-Apr-20	19-Apr-22
31083000	Operation & Maintenance	522	522	17-Apr-20	19-Apr-22
31083010	Bi-Annual Mowing	138	138	01-Jun-20	09-Dec-20
31083020	Monthly Inspections (Annual)	261	261	17-Apr-20	19-Apr-21
31083030	Quarterly Inspections (Months 13-30)	261	261	19-Apr-21	19-Apr-22
31083040	Rain Inspections	492	492	01-Jun-20	19-Apr-22
31083050	Maintenance Events (Fencing, E&S, Soil/Veg Repair)	522	522	17-Apr-20	19-Apr-22
WE08: Demobilization		65	65	23-Dec-19	20-Mar-20
31210110	Removal of Truck Scales/Foundation Pit/Approach Slabs & Related Equipment	4	4	23-Dec-19	26-Dec-19
31210400	Demobilization of Construction Equipment & Temporary Facilitites	1	1	16-Jan-20	16-Jan-20
31210500	Demobilization of Personnel	1	1	19-Mar-20	20-Mar-20
WE09: Post Construction Deliverables		181	181	02-Apr-20	29-Sep-20
31210610	Internal Draft CCR	30	30	23-May-20	21-Jun-20
31210611	NAVFAC Review Internal Draft CCR	30	30	22-Jun-20	21-Jul-20
31210612	Response to NAVFAC Comments / Submit Draft CCR	20	20	22-Jul-20	10-Aug-20
31210613	Regulatory Review Draft CCR	30	30	11-Aug-20	09-Sep-20
31210614	Response to Regulator Comments / Submit Draft Final CCR	10	10	10-Sep-20	19-Sep-20



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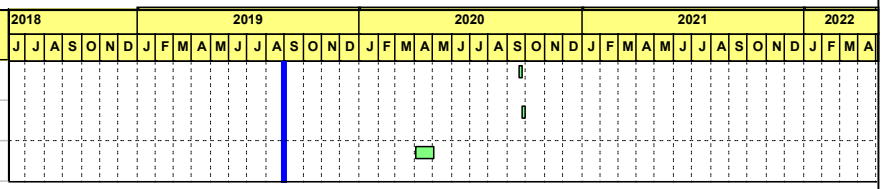
Critical Remain...

Data Date: 31-Aug-19

F6147: Site 1 - RA for Contaminated Soil NWIRP, Bethpage NY

Activity ID	Activity Name	OD	Rem Dur	Start	Finish
31210615	Regulatory Review Draft Final CCR	5	5	20-Sep-20	24-Sep-20
31210618	Final CCR	5	5	25-Sep-20	29-Sep-20
31210620	NIRIS Update	30	30	02-Apr-20	02-May-20



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Appendix B
Project Specifications and Design Drawings

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Appendix C
Project Quality Control Plan

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PROJECT QUALITY CONTROL PLAN
REMEDIAL ACTION WORK PLAN
Site 1 – Former Drum Marshalling Area
Naval Weapons Industrial Reserve Plant
Bethpage, New York

Contract Number: N62470-16-D-9004
Contract Task Order: N4008518F6147F6147

Document Control Number: APTIM-9004-F6147-001

September 2019

Submitted to:

NAVFAC Mid-Atlantic
Gilbert Street, Building N26
Norfolk, VA 23511

Submitted by:
Aptim Federal Services, LLC
150 Boush Street, Suite 701
Norfolk, Virginia 23510

PROJECT QUALITY CONTROL PLAN

1.0 APTIM QUALITY POLICY AND STATEMENT

APTIM Federal Services, LLC (APTIM) implements a Quality Management System (QMS) based upon the business processes of APTIM and is supported by the APTIM Delivery System (ADS) to consistently provide services that meet the requirements of clients and regulatory requirements applicable to projects and corporate activities. APTIM is dedicated to effective application of the QMS, ADS, and process implementation to achieve continuous improvement of systems with the objective of enhancing the satisfaction of clients.

The QMS is supported by procedures, guidelines, work instructions, and forms for planning, implementation, measuring, monitoring, checking, reviewing, and improving the performance of APTIM.

This plan and the referenced ADS documents will be implemented by all APTIM personnel for work activities that affect quality. ADS procedures will be implemented by APTIM projects when determined applicable for the particular scope of work activities.

2.0 SCOPE OF WORK COVERED BY THE QUALITY CONTROL PLAN

APTIM has been selected by the Department of the Navy, Naval Facilities Engineering Command Mid-Atlantic, under Contract No. N62470-16-D-9004, Contract Task Order (CTO) N4008518F6147 to perform a remedial action for contaminated soil at the Site 1 – Former Drum Marshalling Area, Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage, New York.

This Project Quality Control (QC) Plan (PQCP) identifies the following Definable Features of Work (DFOW) for the CTO N4008518F6147 removal action to be performed at Site 1:

- Project Management, Administration Support, and Meetings
- Plans and Preconstruction Activities
- Mobilization and Setup
- Permits and Surveys
- Remedy Implementation
  - Site Clearing
  - Excavate Soils
  - Geosynthetic Clay Liner
  - Sheet Piling
  - Backfilling
- Transport and Disposal of Waste
- Site Restoration
- Demobilization
- Post Construction Deliverables

3.0 PROJECT QUALITY OBJECTIVES AND METRICS USED TO MONITOR PERFORMANCE

In accordance with this PQCP and parent Quality Control Program Plan (QCPP), the Project Quality Control Manager will implement a three-phase control system to manage each DFOW.

The procedure is described below:

Preparatory Phase: Prior to the start of a new DFOW, a preparatory meeting with the construction manager, project engineer, and associated subcontractors to review the work scope, quality

requirements, conditions of installation, preparation and installation or application procedures, and work coordination. A preparatory meeting agenda and document package will be generated. Documents, or sections of, may include:

- Work Plan
- Design Drawings and Specifications
- Any applicable Requests for Information (RFI)
- Approved Equipment and Material Submittals
- Inspection and Test Plans (ITPs)
- Statements of Qualification and/or Certifications

The meeting will be guided by the Preparatory Phase Checklist, provided as Exhibit IX-2. Before the meeting, the Project QC Manager will verify that the 1) required submittals have been transmitted and approved as required; 2) necessary prerequisite work has been completed; and 3) that the materials of construction and equipment for the DFOW are on hand. Agreement will be reached on any open items that must be addressed as well as a plan for completing the action(s). Preparatory meeting agenda and subsequent meeting minutes will be issued to all participants prior to starting the feature of work. Meeting minutes are documented using the Preparatory Phase Checklist.

Initial Phase: During the initial phase, the Project QC Manager will observe and inspect the initial portion of the work performed under a DFOW to establish the quality of the workmanship, to resolve conflicts in construction, and to ensure that testing, when required, is being done and certified by the approved laboratories. This Phase may also have a meeting held with the same attendees as those in the preparatory meeting. The initial phase inspection is guided by the Initial Phase Checklist, provided as Exhibit IX-3, and will be used to document the meeting minutes.

Work procedures will be checked to ascertain that the work conforms to quality and safety requirements. All nonconforming work requiring correction or rework will be documented and reported. All Initial Phase items, along with initial phase checklist and including date, will be provided in a daily report.

Follow-Up Phase: Follow-up inspections will continue to be performed until all work on a DFOW is complete. They ensure work complies with the above-stated requirements, that the quality of workmanship for all work is maintained, and all work being performed meets safety requirements. As part of the follow-up inspection, the inspectors will review the field documentation for accuracy and completeness. If required, field documentation will be returned to the originator for correction or completion. Follow up inspections are documented on the Contractor Quality Control Report, provided as Exhibit VIII-2.

Daily QC Reporting: The Project QC Manager will submit daily, a Contractor QC Report, which contains a summary of the daily QC activities performed by the Project QC Manager. All checklists and inspection documentation should be included with the Contractor Quality Control Report on the day which the checklist or inspection was completed. The report will be submitted to the Contracting Officer's designated representative by 1000 hours the following day.

Daily QC reports will include, but not be limited to the following three-phase control system QC information.

- Details of Preparatory Phase activities including:
  - Review of plans and specifications
  - Verification of approved submittals.
  - Verification of construction material compliance with plans and specifications.
  - Verification of proper material storage.
  - Verification of preliminary work.
  - Review of ITP.

  - Discussion of work method and schedule to complete.
  - Review of Health, Safety and Environment (HSE) requirements and Job safety/hazard analysis.
- Details of Initial Phase activities including:
  - Verification of preliminary work.
  - Confirmation of satisfactory workmanship.
  - Review and acceptance of test results.
  - Verification of compliance with the project plans and specifications.
  - Verification of compliance with HSE requirements.
- Details of Follow-up Phase activities including:
  - Verification of compliance of the work with plans and specifications and the level of satisfactory workmanship established in the Initial Phase.
  - Verification of compliance with HSE requirements.

Bi-Weekly QC Meetings: The Project QC Manager will conduct biweekly QC meetings as determined by the Contracting Officers (CO). Meetings will be documented in the Contractors Quality Control Report. Meetings will be held at a designated site and will be attended by the Project QC Manager, Project Superintendent, Project Manager, and the CO designated representatives. A phone conference bridge will be provided for attendees to participate when not present. The following should be accomplished at each meeting:

- Review the minutes of the previous meeting.
- Review the Variance Request/Request for Information/Concurrence Letter status.
- Review schedule and status of work.
  - Work accomplished since last meeting providing the status within the three phase control.
  - Work to be accomplished before the next scheduled meeting.
  - Meeting and inspection schedule for three phases of control.
- Review Rework Status.
  - Rework items identified and pending completion
  - Rework items completed since last meeting
- Review status of submittals.
  - Submittals reviewed and approved since last meeting
  - Submittals pending approval
  - Submittals required in the near future
- Provide testing to include both on-site and off-site testing.
  - Testing performed since last meeting
  - Testing scheduled prior to the next meeting
  - Test results pending/ received since last meeting
- Review documentation required prior to next meeting.
- Review status of as-builts.
- Review QC and production issues discussed and resolutions accomplished.
- Review other items discussed (i.e. items that may require changes to the PQCP.)
- Review action items.
- Review date of next scheduled QC meeting.

Minutes of the meeting will be prepared by the Project QC Manager and distributed to the attendees within 2 working days of the meeting. Meeting minutes will be documented on the QC Meeting Agenda/Minutes form provided as Exhibit XI-1.

4.0 ORGANIZATION AND RESPONSIBILITIES FOR THE EXECUTION OF THE SCOPE

4.1 Project Quality Control Manager

The Project QC Manager will have the authority to implement and manage the PQCP, the three phases of quality control and the authority to stop work, which is not in compliance with the contract.

The Project QC Manager for this task order will be named prior to the start of work. Approval of this person will be sought prior to appointment by APTIM.

The Project QC Manager will be responsible for the PQCP implementation and quality reporting for this task order. He will work closely with the site personnel and the Project Manager, Monica Smeal, E.I.T, but will report directly to Mr. William Squire, QC Program Manager regarding QC related issues on the site.

The Project QC Manager's responsibilities for this Contract Task Order are examined further in Table 4.1.

Table 4.1 – Project QC Manager Responsibilities

Name	Title	Organizational Affiliation	Responsibilities
<TBN>	Project QC Manager	APTIM	• Manage the site specific QC requirements in accordance with the PQCP. • Attend the coordination and mutual understanding meeting. • Conduct QC Meetings. • Perform the three phases of control. • Perform submittal review. • Perform submittal approval except for submittals designated for Contracting Officer or designated representative approval. • Ensure testing is performed as required. • Prepare QC certifications and documentation required. • Verify that objective evidence has been provided to document satisfactory performance of the work (i.e. daily reporting and photo documentation). • Exercise authority to stop work or direct removal and replacement of non-conforming work. • Review results of on-site verification testing and inspection reports. • Maintain the latest drawings and specifications with amendments and/or approved modifications at the site and ensure they are used for shop drawings, fabrication, construction, inspections, and testing. • Maintain as-built drawings at the site, available for review by the Navy at all times. • Establish and maintain a Rework Item List of work that does not conform to specifications. Track and monitor these items to assure that the rework inspection and testing activities and frequencies are in accordance with contract requirements. • Attend and assist the government at the pre-final inspection and the final acceptance inspection. • Confirm the quality and quantity of materials delivered to the site as referenced by project specifications and/or design drawings. • Submit the QC reports to the COs representative and Project Manager on a daily basis.

4.2 Quality Control Program Manager

Mr. Squire, QC Program Manager will serve to resolve any QC related issues, which need his involvement. The Project QC Manager will have a direct line of communication to the QC Program Manager on QC issues.

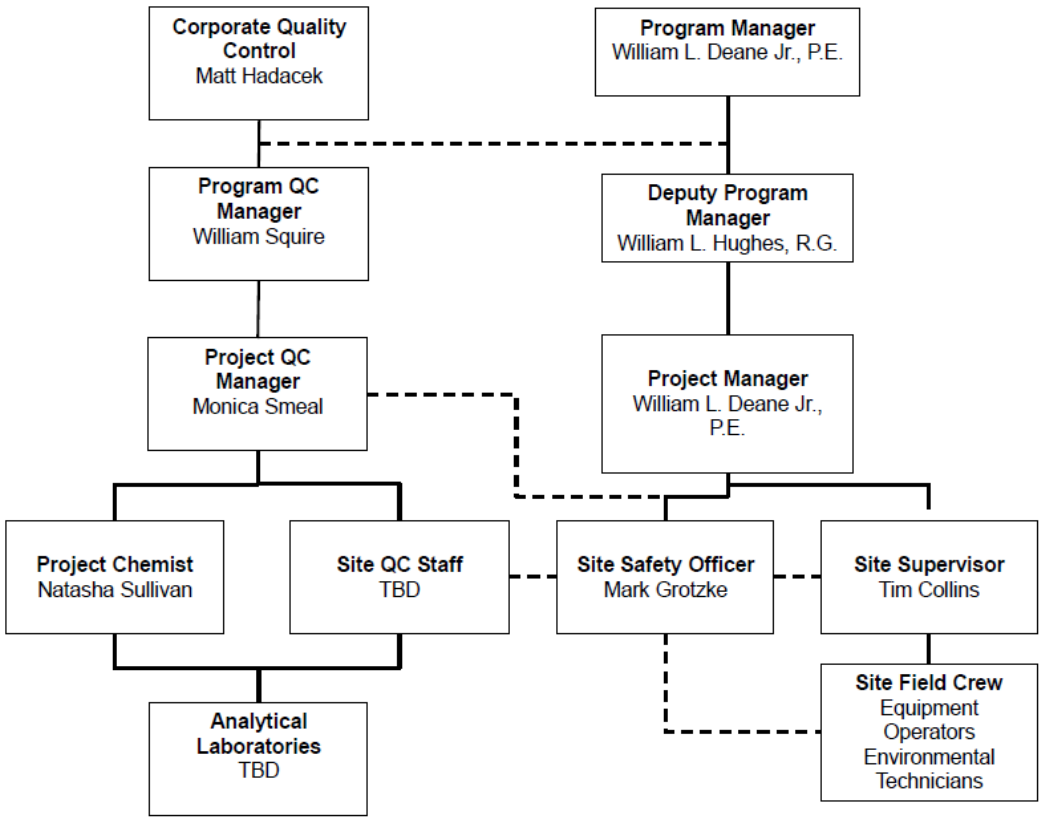
4.3 Alternate Quality Control Specialist

An Alternate QC Specialist will be assigned to assist the Project QC Manager during site construction. The resume of this person and appointment letter will be submitted for approval.

4.4 Organizational Chart

The relationship between the QC Organization, and Production Personnel of the Task Order, is presented in the Organizational Chart, Figure 4.4.

Figure 4.4 Project Organization Chart



4.5 Identification of Personnel Assigned to the QC Organization

The resume of the Project QC Manager will be submitted as Exhibit I-1 for approval prior to the commencement of work.

4.6 Appointment Letters

The Project QC Manager Appointment letter is provided as Exhibit II-1.

5.0 QUALITY PROCEDURES

The quality procedures for the PQCP are guided by the quality procedures set forth in the QCPP.

6.0 RELATED QUALITY CHECKLISTS / OTHER FORMS

6.1 Outside Organizations

A list of outside organizations such as subcontractors employed by APTIM for work under this CTO is provided in Exhibit III-1. This list provides each firm's name and address and a description of the services each firm will provide. This list will be maintained current and will be available for review.

6.2 Initial Submittal Register & Reviewer

6.2.1 Submittal Register

The Initial Submittal Register is provided as Exhibit IV-1. The status of each submittal will be recorded as changes occur.

6.2.2 Personnel Authorized to Review and Certify Submittals

Personnel authorized to review and certify submittals are identified on Exhibit IV-2. Any additional personnel assigned to perform submittal review and certification must be approved by the CO prior to performance.

6.3 Testing Laboratory Accreditation

The testing laboratory accreditation will be provided with the submittal of the Uniform Federal Policy (UFP) - Quality Assurance Project Plan (QAPP). The approval of the UFP-QAPP will serve as the approval of the laboratory for use in the project execution. The UFP-QAPP will be updated annually to include any updated accreditation or certifications.

6.4 Testing Plan and Log Preparation

A Testing Plan and Log has been prepared for this CTO and is provided as Exhibit V-1.

6.5 Requests for Information

When a project condition changes, a RFI will be submitted with a course of action for continuation. This RFI will be submitted to the CO for approval or direction. The RFI form is provided in Exhibit VI-1.

6.6 Rework Items

Rework Items will be documented on the Daily Contractor QC Report and on the Rework Items List. This list will be used to report and track Rework Items. The Rework Items List is provided as Exhibit VII-1.

6.7 Documentation Procedures

The Daily Contractor Production Report form and the Daily Contractor QC Report form will be used to document daily activities at the site. These forms are provided as Exhibits VIII-1 and VIII-2, respectively.

6.8 Quality Control Inspection Plan

The QC Inspection Plan, Exhibit IX-1, lists the Task Order Remedial Action Work Plan section and definable feature of work with provisions for recording the corresponding checklist/report for each phase of the three-phase control process. As each control phase is satisfactorily performed, the Project QC Manager will record the corresponding report number and date.

This list has been prepared to correspond to the scheduled remedial action activities. Each preparatory, initial and follow-up phase checklist/report will reflect the construction activity number derived from the construction schedule. As a part of the QC inspection plan, the Preparatory Phase and Initial Phase Checklists are provided as Exhibits IX-2 and IX-3 respectively.

6.9 Personnel Matrix

The personnel matrix, Exhibit X-1, shows each section of the Task Order Remedial Action Work Plan sections with identification of who will review and certify submittals, who will perform and document the three phases of control, and who will perform and document testing.

7.0 LIST OF EXHIBITS

Exhibit I-1	Project QC Manager Resume
Exhibit II-1	Project QC Appointment Letter
Exhibit III-1	Outside Organization/Subcontractor List
Exhibit IV-1	Submittal Register
Exhibit IV-2	List of Personnel Authorized to Review and Certify Submittals
Exhibit V-1	Testing Plan and Log
Exhibit VI-1	Request for Information Form
Exhibit VII-1	Rework Items List
Exhibit VIII-1	Contractor Production Report
Exhibit VIII-2	Contractor QC Report
Exhibit IX-1	QC Inspection Plan
Exhibit IX-2	Preparatory Phase Checklist
Exhibit IX-3	Initial Phase Checklist
Exhibit X-1	Personnel Matrix
Exhibit XI-1	QC Meeting Template

8.0 DEFINITIONS

Below is a list of acronyms and abbreviations, and their definitions, used in this document:

APTIM	APTIM Federal Services, LLC
ADS	APTIM Delivery System
CO	Contracting Officer
CTO	Contract Task Order
DFOW	Definable Feature of Work
HSE	Health, Safety, and Environment
ITP	Inspection and Test Plan
PQCP	Project Quality Control Plan
QC	Quality Control
QCPP	Quality Control Program Plan
QMS	Quality Management System
RFI	Request for Information
TBN	To Be Named
UFP-QAPP	Uniform Federal Policy for Quality Assurance Project Plan

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APTIM
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Fax: +1 225.952.3058

September 30, 2019

Monica Smeal
150 Boush Street
Suite 701
Norfolk, VA 23510

Ref: N62470-16-D-9004 CTO F6147

Subj: Project QC Appointment Letter
Site 1, Former Drum
Marshalling Area
NWIRP
Bethpage, New York

Dear Ms. Smeal,

This letter will serve as your appointment as the Project Quality Control Manager on the referenced project and will also clarify your duties and authority in this position. In this position, you will be authorized to use available resources to satisfy all applicable requirements of the Program and task order Quality Control Plans.

This authorization specifically gives you the authority to direct removal and replacement or correction of nonconforming materials or work and stop work authority when continuation would be unsafe to personnel, harmful to the environment, or result in a significant degradation of quality.

You will be expected to work closely with the Project Manager and other project personnel, but you will not be directly responsible to anyone but me for resolution of quality issues when working in the capacity of Project Quality Control Manager.

If you have any questions, please contact me at 412.858.1638 or william.squire@aptim.com.

Sincerely,

Bill Squire.
Program Quality Control Manager
NAVFAC RAC Program

APTIM Federal Services, LLC.

Please Reply To: Bill Squire
Phone: 412 858 1638 office, 412-736-0930 cell
E-Mail Address: william.squire@aptim.com

Last Updated: 17 Sep 2019

Monica Smeal

Professional Qualifications

Ms. Monica Smeal holds a Bachelor of Science in Civil Engineering Technology, an Engineer in Training License, and has over ten years of engineering experience including environmental remediation, long term monitoring, operation and maintenance of treatment facilities, project management, construction coordination, construction management, and quality control inspection. Ms. Smeal is currently performing as an Engineering Lead and a Project Manager on NAVFAC led projects under various environmental contracts.

Education

Bachelor of Science, Civil Engineering Technology, Old Dominion University, Norfolk, Virginia, 2009

Additional Training/Continuing Education

Construction Quality Management for Contractors, U.S. Army Corps of Engineers, 2019
8-Hour HAZWOPER Refresher, Norfolk, VA, 2019
Vapor Intrusion Pathway: A Practical Guideline, Cambridge, MA, 2010
Munitions Response Site Management, Norfolk, Virginia, 2010
8-Hour HAZWOPER Supervisor Training, Findlay, Ohio, 2010
Hazard Assessment & Resolution Program (HARP), Findlay, Ohio, 2010
EI-HS026 Safety Observation Program, Findlay, Ohio, 2010
Confined Space - Entry Supervisor (Ent. & Attn.) , Findlay, Ohio, 2010
OSHA 30 Hour Construction Safety, Findlay, Ohio, 2010
Excavation Competent Person Training, Findlay, Ohio, 2010
Site Safety Officer, Findlay, Ohio, 2010
24-Hour HAZWOPER Field Experience, Camp Peary, Virginia, 2009
40-hour Hazardous Waste Operations and Emergency Response , Reactives Management Corporation , 2009
Survey of Munitions Response Technologies, ITRC Training Web Site, 2009

Registrations/Certifications/Licenses

Heartsaver CPR/AED Certified, American Heart Assoc, 2009, 186002978728, Active, Nationwide, 03/2020
Erosion & Sediment Control Resp. Land Disturber, 2009, RLD05362, Active, Virginia, 11/2019
Engineer in Training, 2016, Active, Virginia
Erosion & Sediment Control Resp. Land Disturber, 2016, RPC005613, Active, Maryland

Experience and Background

04/2016 - Present
Engineer/Project Manager, Aptim Federal Services, Technical Services, Norfolk, Virginia

Ms. Smeal is an Engineer, performing for APTIM as a Technical Lead and Project Manager. Her responsibilities include technical management, construction management, coordination of procurement activities, cost and production tracking, budget and schedule management, and construction quality

control management. Ms. Smeal is also engaged in the management of technical staff performing on remedial action construction projects.

The following is a summary of key projects:

Project Manager, Remedial Action At The Former Lake Hancock Target Range, 501024, NAVFAC Northwest, Naval Air Station Whidbey Island, WA, $1,879,530.00, 10/2018 - Present

Ms. Smeal is the Project Manager for the remedial action at Site EO351, Former Lake Hancock Target Range (LHTR), Naval Air Station (NAS) Whidbey Island, WA. The remedial action included implementation of surface clearance and land use controls. Based on results of past investigations at the LHTR, it is presumed that munitions and explosives of concern (MEC)/ material potentially presenting an explosive hazard (MPPEH) is present at LHTR.

Major work elements included 100% surface clearance of MEC/MPPEH encompassing 28.1 Acres; Installation of LUC Signs, 1,925 LF of perimeter fencing and 2,125 LF of tideland fencing; Repair of 5,203 LF of perimeter fencing; Record of Survey; and Tideland Survey.

Deputy Project Manager, Site 1 Former Drum Marshalling Area Remedial Action for Contaminated Soil, 501164, NAVFAC MIDLANT, Bethpage, NY, $21,575,232.00, 07/2018 - Present

Ms. Smeal is the Technical Lead and Deputy Project Manager for the removal and disposal of approximately 32,000 cubic yards of polychlorinated biphenyl (PCB) impacted soil from Site 1 - the Former Drum Marshalling Area at the Naval Weapons Industrial Reserve Plant.

A limited excavation will be conducted to remove PCB-contaminated soil with concentrations greater than 1 mg/kg to a depth of 2 feet below ground surface (bgs) and 10 mg/kg to a depth of 10 feet bgs; and excavation of PCB contaminated soil with concentrations greater than 50 mg/kg to a depth of 20 feet bgs at Site 1 and to a depth of 30 feet bgs at Dry Well 20-08 area. Other contaminants of concern (COCs) co-located with PCBs will be removed as a result of excavation.

The selected remedy includes installation of a reduced permeability cover in areas over the residual PCBs and other COCs greater than the Cleanup Levels.

Lead Engineer, Deputy Project Manager, Phase I RM108 Area Hotspot Treatment System, 501012, NAVFAC Atlantic, NWIRP Bethpage, Long Island, NY, $2,935,099.00, 01/2018 - Present

Ms. Smeal is the Technical Lead and Deputy Project Manager for the installation of a Conveyance Line to connect an extraction well to an existing groundwater treatment system. Approximately 4,000 LF of conveyance piping will be installed in an existing utility corridor to convey treatment water to the GM38 Plant. APTIM is responsible for the installation of communication systems to allow the existing GM38 Plant to communicate with the extraction well.

Other Comments:
No Comments

Lead Engineer, Deputy Project Manager, Moving Target Mortar Range - North, 501010, NAVFAC Mid-Atlantic, Dam Neck Annex, Virginia Beach, VA, $269,726.00, 11/2017 - Present

Ms. Smeal was the Lead Engineer and Deputy Project Manager for the removal of UXO items to a depth of 3 feet into native soil to effectively achieve a low-risk standing in regards to contact with UXO to within the footprint of Energy Saving Construction Activities located on the former Moving Target Mortar Range-North.

Accomplishments:
The field work for this project was completed ahead of schedule, under budget, and without any health and safety incidents.

Other Comments:

No Comments

Project Manager, Remedial Action Operations Monitoring of Groundwater at Sites 11, 12, 13, and SWMU 3, 501036, NAVFAC Mid-Atlantic, Joint Expeditionary Base Little Creek, Virginia Beach, VA, $99,472.00, 11/2017 - Present
Ms. Smeal is the Project Manager for the performance of groundwater monitoring events for the Remedial Action Operation at Sites 11, 12, 13, and SWMU 3 through annual, semi-annual, and/or quarterly sampling as described in the respective Sampling and Analysis Plans

Other Comments:
No Comments

Site Engineer and Quality Control Manager, Remedial Action - Steam Injection with Free Product Recovery and Biosparging, 500689, NAVFAC Mid- Atlantic North, NWIRP Bethpage, Bethpage NY, $2,021,900.00, 07/2017 - Present
Ms. Smeal is the Site Engineer and Quality Control Manager for the completion of a 60% design, construction, startup, and operation and maintenance of a steam injection system with free product recovery Soil Vapor Extraction, and Biosparging to extract and treat free product between 50 and 73 feet bgs and associated chlorinated and petroleum based VOC contamination in soil. The system is designed to target the free product and TPH concentrations above 10,000 mg/kg with the steam injection, and TPH concentrations above 1,000 mg/kg with the biosparging. Soil Vapor Extraction will accompany both systems. Once constructed, APTIM will operate and maintain for 18 months.

Other Comments:
No Comments

Project Manager, Cover and Cap Inspections and Long Term Monitoring, 500939, NAVFAC Washington, Naval Air Station Patuxent River, MD, $99,420.60, 06/2017 - Present
Ms. Smeal is the Project Manager for the performance of groundwater monitoring, landfill cover and cap inspections, and landfill gas monitoring at Sites 6, 11, 17, 39, and Sites 1 and 12 through annual, semi-annual, and/or quarterly events.
In addition, monitoring reports are produced and submitted to detail the sample results and inspection findings.

Other Comments:
No Comments

Site Manager, P815 MILCON Construction Removal at NAS Oceana including Dam Neck Annex, VA, 500828, NAVFAC Mid-Atlantic, P815 Damn Neck Annex, Virginia Beach, VA, $964,972.00, 10/2016 - Present
Ms. Smeal is the Project Manager for the removal action at the Moving Target Mortar Range-South at Dam Neck Annex.
UXO items will be removed to a depth of 3 feet into native soil to effectively achieve a low-risk standing in regards to contact with UXO to within the footprint of P815 MILCON Construction Activities located on the former Moving Target Mortar Range-South.

Other Comments:
No Comments

Project Manager, Construction Support at Naval Air Station Oceana including NALF Fentress, 500809, NAVFAC Atlantic, NALF Fentress, Chesapeake, VA, $826,700.00, 09/2016 - Present

Ms. Smeal is the Project Manager for all work required to install granulated activated carbon (GAC) units and continue emergency response actions at NALF Fentress. The project team was responsible for installing GAC Units and necessary upgrades at the Drinking water treatment plant, including replacement pumps, piping, and electrical to support the treatment of drinking water to remove PFAS/PFOA from the supply. Additionally, to install GAC units and necessary upgrades to the waste water treatment plan including temporary pumping/pre-treatment/treatment of PFAS/PFOA contaminated water. Once installed, Operation and Maintenance manuals were drafted. The project also requires the supply of drinking water to private residences around the facility impacted by PFAS/PFOA and maintain a public filling station.

Accomplishments:
The project team designed a simpler system to treat the waste water reducing the costs associated with the treatment of PFAS/PFOA.

Other Comments:
No Comments

Technical Lead/Quality Control Manager, Facility Wide Environmental Restorations Naval Air Station Patuxent River, 500630, NAVFAC Washington, Naval Air Station Patuxent River, MD, $3,106,284.00, 06/2016 - Present
Ms. Smeal is the Technical Lead and Quality Control Manager for the multi-site environmental restorations at NAS Patuxent River (PAX River). Actions will be performed in accordance with CERCLA, and the NCP under DoD Guidance and Navy ERP and MRP policy. The initial efforts were concentrated at Sites 21, 31, and 55 as described below.

Site 21 is a former waste water treatment plant that included eight sludge drying bays, in operation from the 1940's thru 1970. There is a small VOC plume associated with the former operation as well as demolition debris from the former waste digesters and clarifiers. The scope of work (SOW) is to remove and dispose of the VOC impacted soil and all debris associated with the former waste digesters and clarifiers.

Site 31 is located at the Aircraft Intermediate Maintenance Department (AIMD) facility. The AIMD is responsible for cleaning aircraft tires, repair of fiberglass radomes, painting, and testing. The site has operated since 1943 as a tire shop. Tires were cleaned in large vats containing solvent and cleaning compound. The rinsate, including organic and inorganic compounds from brake linings as well as residual solvent and cleaning compounds were drained into an open ditch which outfalls into the West Patuxent Basin (until 1970). After 1970, the rinsate drained via a 24-inch storm drain, discharging directly to the basin. The SOW is to remove soil associated with PAH contamination and conduct groundwater remediation via substrate injection.

Site 55 consists of a portion of a perennial stream downgraident from a former hazardous waste storage hut was located immediately upgradient were stored materials containing PCBs. PCB contamination is present within the stream area. The SOW is to remove and dispose of the PCB contaminated soil and restore the site.

Accomplishments:
Site 55: Due to excess surface water run-off and heavier rain events during construction at Site 55, the excavated material was overly saturated (beyond expectations during planning) and severely impacted the excavation and stockpile of the material. APTIM recommended the application of lime, in-situ to solidify the soils and allow for easier excavation and stockpiling. Based on the pH of the lime, CB&I recommended the over-excavation of the site to remove any impacts of the lime. Furthermore, pH

analysis was added to the confirmatory sampling requirement to ensure no residual impacts from such. APTIM received concurrence from the Navy, EPA, and MDE to implement this strategy.

Other Comments:
No Comments

Site Manager, Philpott Dam Powerhouse Immediate Response, 500446, USACE Wilmington, Boydton, VA, $489,100.00, 05/2016 - 05/2017
Ms. Smeal was the Site Manager for the emergency/immediate response to clean the powerhouse to applicable standards with respect to residue/soot containing lead, PCBs, and Dioxins after an ArcFLASH induced a fire within the powerhouse at the Philpott Dam (John Kerr Reservoir). The powerhouse was cleaned up in Level C PPE due to the airborne hazards associated with lead and PCBs. Prior to full scale cleaning, damaged ACM containing material was removed by a licensed Asbestos Contractor. The project also had a radiological component associated with several electrical components with required isolation and characterization before being disposed of as NORM.

Accomplishments:
The project was completed in Level C PPE and there were zero H&S incidents associated with the project.

Other Comments:
No Comments

07/2014 - 04/2016
Environmental Engineer 2, Watermark Environmental, Lowell, Massachusetts

Ms. Smeal was hired on as an Environmental Engineer at Watermark Environmental. Ms. Smeal managed the environmental remediation monitoring, optimization, and implementation of a remedy in place at various Naval Installations. Primary duties included managing a field team of engineers and environmental technicians implementing the monitoring of a remedial design at the former NAS. Ms. Smeal had full responsibility for the project from the planning stage though final reporting. During the planning stages, Ms. Smeal prepared the estimate including field take-offs and quantification of requirements. During the field operations, Ms. Smeal managed an environmental team implementing the remedy. Ms. Smeal was responsible for preparing field design changes, field calculations, geotechnical analysis and interpretation during well installation, groundwater modeling data collection, and supervising the preparation of hydraulic flow patterns and groundwater modeling. Upon completion of the field activities, Ms. Smeal authored the annual reports which included groundwater modeling, hydraulic flow mapping and calculations, natural attenuation calculations, and remedial recommendations.
Ms. Smeal also authored a final site closure document, which included administrative release based upon an engineering analysis that indicated the site no longer posed a risk to the public.
Ms. Smeal participated in the design for a replacement thermal oxidizer and a shallow tray air stripper to optimize a remedial design. This included process flow diagrams, piping and instrumentation diagrams, layout drawings, and pipe layout drawings. Ms. Smeal also complete engineering calculations needed to support the design. Finally, Ms. Smeal prepared a specification package to procure and install the system.

The following is a summary of key projects:
Environmental Engineer, Silresim Groundwater Treatment Plant Operation and Maintenance, MassDEP, Lowell, MA, 10/2014 - 06/2016
Watermark was contracted by MassDEP to complete the design for a replacement thermal oxidizer and to integrate the shallow tray air stripper into the Silresim Groundwater Treatment Plant design. Ms. Smeal assisted this project by updating the process flow diagram, piping and instrumentation diagrams, layout

drawings, and pipe routing diagrams. In addition, Ms. Smeal complete calculations needed to support the design and produced a specification package.

Environmental Engineer, Long-Term Monitoring Program, McAllister Point Landfill, NAVFAC Mid-Atlantic, Newport, RI, 04/2015 - 04/2016
Watermark was contracted with Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic to perform Long-Term Monitoring and Operation & Maintenance for the McAllister Point Landfill at the Naval Station in Newport, Rhode Island. Ms. Smeal has served as the field lead, coordinating and managing efforts in the collection of groundwater, landfill gas screening, landscaping, settlement surveys, and conducting landfill inspections. In addition to her onsite support, Ms. Smeal has also contributed to producing and editing data submission reports. Reports included the Gas Screening Report, Semi-Annual Landfill Inspection Report, Annual Landfill Monitoring Report, and Marine Monitoring Report.

Environmental Engineer, Long-Term Monitoring Program, Former Naval Air Station Brunswick, NAVFAC Mid-Atlantic, Brunswick, ME, 08/2014 - 04/2016
Watermark was contracted with Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic, to conduct long-term monitoring activities at the former Naval Air Station in Brunswick, Maine. Ms. Smeal has served as the field lead, coordinating and managing efforts in the collection of groundwater, surface water, porewater, and sediment throughout Site 2, Site 7, Site 9, Site 17, Sites 1 & 3, and the Eastern Plume.
In addition to her onsite support, Ms. Smeal has also contributed to producing and editing data submission reports from several semi-annual sampling events.

Environmental Engineer, Remedial Action at Site 16, Naval Construction Battalion Center, NAVFAC Mid-Atlantic, Davisville, RI, 09/2015 - 03/2016
Watermark was contracted with Tetra Tech EC, Inc. to conduct groundwater sampling services at the Naval Construction Battalion Center in Davisville, Rhode Island. Ms. Smeal has served as the field lead, coordinating and managing efforts in the collection of groundwater at Site 16.

Environmental Engineer, Permanent Solution Statement (With Conditions), Global Companies LLC, Revere, MA, 10/2015 - 12/2015
Watermark was contracted by Global Companies LLC to prepare Permanent Solution Statement with Conditions for the Blue Line Release Tracking Number 3-14835 located in Revere, Massachusetts. Ms. Smeal prepared the Permanent Solution Statement which was inclusive of an Activity and Use Limitation, a Phase IV Completion Statement which documented the completion of recent Phase IV system upgrades, a ROS six-month status report, and a Phase V Completion Statement documenting that Phase V activities were completed.

Quality Control Manager, FOB2 Environmental Remediation Project, Washington Headquarters Services, Arlington, VA, 10/2014 - 06/2015
Watermark was contracted with Washington Headquarters Services (WHS) to complete removal of demolition debris in soil and site restoration of identified areas of the Federal Office Building No. 2 (FOB2) complex for use as an extension of the Arlington National Cemetery (ANC). Ms. Smeal's role with the project included pre-construction permit coordination as well as onsite Quality Control Manager (QCM). As the onsite QCM, Ms. Smeal was tasked to ensure that the construction, to include that of subcontractors and suppliers, complied with the requirements of the contract. Ms. Smeal demonstrated this compliance with three phases of for each definable feature of the construction work. These phases included the Preparatory Phase, Initial Phase, and Follow-up Phase.

10/2009 - 06/2014
Civil/Struc Engineer 1, CB&I Federal Services, Federal Services, Norfolk, Virginia

Ms. Smeal was hired as an Engineer. Responsibilities included engineering, quality control, and technical support on various environmental remediation and construction projects. Primary duties included construction surveying using a total robotic station, low-flow ground water sampling, soil sampling, water treatment system sampling, subcontractor oversight, and Quality Control Management. MS. Smeal authored various technical reports and documents including project subcontractor scopes of work, work plans, technical memorandums, and construction completion reports.

The following is a summary of key projects:

QC Manager, Site Health and Safety Officer, Remedial Action at Operable Unit 2 DRMO Area, 141967, NAVFAC Mid-Atlantic, PNSY. Kittery, Maine, $5,721,011.00, 07/2013 - 06/2014

The Portsmouth Naval Shipyard is tasked with the repair and overhaul of US Navy submarines. Operable Unit 2, Site 6 is the former DRMO Storage facility. Project includes the removal of soil and debris associated with the former activities, including the removal of an interim cap and waste in place. Primary contaminants are Lead and Nickel, others include PCB's, PAH's, and heavy metals.

Accomplishments:
Project received the first approval ever at the facility for soil stabilization to stabilize lead within contaminated soil. This process saved the Navy over $3 Million in costs.

Awards/Client Commendations:
Construction Phase received 100% of available award fee.

Other Comments:
No Comments

Site Health and Safety officer, Removal Action at Site 41D, 133553, NAVFAC Mid-Atlantic, AFETA Camp Peary, $221,000.00, 05/2013 - 05/2013

The Removal Action Objective for the non-time critical removal action at Site 41B was to implement measures that would eliminate the potential for exposure to concentrations of mercury in site soil above 0.77 milligram per kilogram, a level protective of potential current and/or future human and ecological receptors under an unrestricted land use scenario.

QC Manager, Site 8 - Interim Removal Action, 143620, NAVFAC Washington, NSF Indian Head, Indian Head, MD, $1,200,000.00, 07/2012 - 11/2012

CB&I performed an interim removal action to remove and dispose of lead and mercury contaminated soil and sediment in the lower section of the stream and mercury contaminated sediment in the upper portion of the pond at Site 8, Naval Support Facility, Indian Head, Maryland.

QC Specialist / Health and Safety Specialist / Site Engineer, Removal Action at Site 41B, 133553, NAVFAC Mid-Atlantic, AFETA Camp Peary, $948,983.00, 04/2012 - 07/2012

Site 41B is approximately one acre in size where a wastewater treatment plant was historically located which consisted of an abandoned trickler clarifier, sludge-drying filter beds, associated piping (including a wastewater discharge pipe), and a chlorination building.
Temporary access paths were constructed into the wetlands to assist in reaching the sediment furthest from the shore within each of the three cells. The wetlands removal area was excavated to a minimum depth of two feet below existing grade. Approximately 2,285 tons of sediment was removed. The sediment was transported to the holding cell using an off-road dump truck, where it was allowed to air-dry and was mixed with a drying agent (Turface MVP) for solidification purposes. . The material was then temporarily stored in the holding cell for load-out during T&D operations.
Backfill used in the removal area consisted of a mixture of 50 percent sand and 50 percent topsoil. A total

of 7,800 smooth cordgrass plugs were planted.

QC Specialist / Site Engineer, Lab Area Remedial Action, 143786, NAVFAC Washington, NSF Indian Head, $719,609.00, 11/2011 - 07/2012
The Lab Area is located in the northeastern portion of NSF-IH and covers approximately 14 acres, consisting of Sites 14, 15, 16, 49, 50, 53, 54, and 55; other buildings (Buildings 303, 304,555, and 596); and the Wetland Area (Figure 1). The sites and other buildings are collectively known as the Upland Area. Because of similar historical usage, proximity, the sharing of sewer utilities, and overlapping field investigations, the area encompassing these sites is referred to as the Lab Area.
The Lab Area was divided into five remedial phases, which contained elevated levels of arsenic, lead, and mercury. The vertical extent of excavation required at the site was predetermined to be one foot below the existing ground surface. The exact lateral extent of excavation required was determined following mobilization, after completion of pre-post excavation confirmation sampling.
After confirming that the excavation extents had been met, the excavation areas were backfilled.

QC Specialist / Site Engineer / Site Health and Safety Officer, SWMU 13 - Stormwater Pipe Replacement, 142335, NAVFAC Washington, Annapolis, Maryland, $43,798.00, 04/2011 - 05/2011
In order to maintain SWMU 13, Shaw replaced approximately sixty feet of degraded vitrified clay pipe running from an existing manhole toward the fence line of the US Naval Academy.
Ms. Smeal role in the project included Technical Memorandum preparation, Quality Control Specialist, Site Health and Safety Officer, and Construction Completion Letter Report preparation.

QC Alternate / Site Engineer, MCB-2 Landfill Repair (Southeast Slope), 135443, NAVFAC Washington, Quantico, Virginia, $1,160,605.00, 10/2010 - 05/2011
The project objective was to repair the failed section of the landfill cap. This was accomplished by removing the existing material from the failed slope, repairing the geomembrane layer, and the installation of a new drainage layer, cover soil layer, and vegetative layer.
Ms. Smeal role in the project included Work Plan preparation, Quality Control Specialist, Site Health and Safety Specialist, and Construction Closeout Report preparation.

Site Engineer / Alternate QC Manager, Operable Unit #2 - Paradise Creek Disposal Area, Department of the Navy, Portsmouth, Virginia, 06/2009 - 07/2010
Operable Unit #2 Paradise Creek Disposal Area contains two landfills (Eastern and Western) totaling approximately 50 acres. Shaw was tasked with grading, maintenance of existing cover, and final restoration activities for the Eastern Landfill area and the Western Landfill area. Shaw was also tasked with the excavation of sediments from a salt marsh wetland area adjacent to the Eastern Landfill, and subsequent restoration.

Ms. Smeal role in the project included Project Engineer, Quality Control Manager, Site Health and Safety Specialist, and Completion Report preparation.

EXHIBIT III-1

OUTSIDE ORGANIZATION/SUBCONTRACTOR LIST
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

COMPANY NAME AND ADDRESS	DESCRIPTION OF SERVICES PROVIDED
Onion Equipment Company Harris-Blade JRM Equipment	Equipment Rental and Service
Hager-Richter Geosciences	Utility Survey and Markout
Valente Electrical Contracting Corporation	Electrical Services
Residential Fences Corp	Fence Installation (Temporary and Permanent)
Along Road	Jersey Barriers
Advance Scale	Truck Scale Installation
National Grid	Gas Line Relocation
Banc 3 Engineering	Surveying
TBD	GCL Installation
TBD	Sheet Piling Installation
TBD	In-Place Density Testing
TBD	Transportation and Disposal
TBD	Hydroseeding
TBD	Curb Restoration
TBD	Bituminous Concrete Paving
TBD	Fill Materials (soil, riprap, aggregate)
SGS Accutest Laboratories - Orlando	Analytical Testing

EXHIBIT IV-1 - Submittal Register

Contract Task Order No. N4008518F6147 **Contract No. N62470-16-D-9004**	**APTIM Project No. 501164** **Project Title: Site 1 - Former Drum Marshalling Area** **NWIRP Bethpage, New York**	**Revision No. 00** **APTIM Federal Services LLC**

Spec. Sect.	SD Number and Submittal Description	Spec Paragraph Number	Approving Authority	Other Reviewers	Transmittal Control No.	Planned Submittal Date	Contractor Action			Approving Authority				Date Rcvd from Appx Auth	Remarks
							Action Code	Date of Action	Date Forwarded to App. Auth/ from Contr	Date Forward to Other Reviewer	Date Rcvd from Other Reviewer	Action Code	Date of Action		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
	SD-01 Preconstruction														
01 31 00	Work Plan	1.03	G	E											
01 31 00 01 35 26	Accident Prevention Plan (includes Health and Safety Plan)	1.02 1.01-1.07	G, E												
01 31 00	Construction Quality Control Plan	1.03	G												
N/A	Sampling and Analysis Plan		G												
N/A	Waste Management Plan		G												
01 50 00	Environmental Protection Plan (Spill Prevention, Control and Countermeasures Plan)	1.02, 1.17	G	E											
N/A	Storm Water Pollution Prevention Plan		G												
01 31 00 01 50 00 32 17 20	Traffic Control Plan	1.03 1.02, 1.11 1.01-3.02	G	TOB, E											
01 31 00	Site Plan	1.03, 1.18	G, E												
01 31 00	Construction Progress Schedule	1.04	G	E											
01 50 00	Permits (Street Opening, Partial Street Closure, Weight)	1.11	TOB												
01 40 00	Testing firm and laboratory qualifications	1.04	E												
02 81 02	Certification of all waste transporters, including NYDOT identification number and expiration date, and proof of permit or authorization to transport hazardous waste in New York	1.03		E											
	SD-02 Shop Drawings														
01 50 00	Temporary signage	1.02, 1.09		G, E											
03 30 00	Headwalls, endwalls, wingwalls and all other cast-in-place concrete structures	1.03	E												
10 88 00	Truck scales, including scale pit and approach slabs	1.03													
31 30 00	Geosynthetic Clay Liner	1.03		E											
31 41 16	Sheet piling (plan)	1.04	E												
31 41 16	Sheet piling (as-built)														
32 31 13	Chain link fence and gates	1.03	E												

EXHIBIT IV-1 - Submittal Register

Contract Task Order No. N4008518F6147 **Contract No. N62470-16-D-9004**	**APTIM Project No. 501164** **Project Title: Site 1 - Former Drum Marshalling Area** **NWIRP Bethpage, New York**	**Revision No. 00** **APTIM Federal Services LLC**

Spec. Sect.	SD Number and Submittal Description	Spec Paragraph Number	Approving Authority	Other Reviewers	Transmittal Control No.	Planned Submittal Date	Contractor Action			Approving Authority				Date Rcvd from Appx Auth	Remarks
							Action Code	Date of Action	Date Forwarded to App. Auth/ from Contr	Date Forward to Other Reviewer	Date Rcvd from Other Reviewer	Action Code	Date of Action		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
33 40 00	Precast concrete structures shop drawings, cut sheets, and design calculations	1.03	E												
	SD-03 Product Data														
01 57 13 31 35 20	Geotextiles and turf reinforcing matting material properties and technical data sheets	1.03 1.03	E												
03 30 00	Reinforcing steel, concrete admixtures, curing aids and all other materials used for cast-in-place concrete	1.03	E												
31 30 00	Geosynthetic Clay Liner, including origin of bentonite and geotextiles	1.03		E											
31 30 00	GCL technical data including MARVs	1.03		E											
31 35 20	Erosion control blankets	1.03	E												
31 41 16	Sheet piling	1.04	E												
10 88 00	Truck scale equipment	1.03													
32 93 43	Replacement trees and landscape features	3.04	G												
32 31 13	Chain link fence and gates	1.03	E												
33 40 00	All products used in storm drainage utilities	1.03		E											
	SD-04 Samples														
01 57 13	Turf Reinforcing Matting	1.03	E												
01 57 13 31 35 20	Erosion Control Matting	1.03	E												
31 30 00	Geosynthetic Clay Liner	1.03		E											
	SD-05 Design Data														
31 41 16	Sheet piling design calculations	1.04	E												
31 41 16	Sheet piling design detail and connections	1.04													
03 30 00	Cast-in-place concrete mix designs	1.03	E												
32 12 16	Bituminous concrete mix designs	1.02													

EXHIBIT IV-1 - Submittal Register

Contract Task Order No. N4008518F6147 **Contract No. N62470-16-D-9004**	**APTIM Project No. 501164** **Project Title: Site 1 - Former Drum Marshalling Area** **NWIRP Bethpage, New York**	**Revision No. 00** **APTIM Federal Services LLC**

							Contractor Action			**Approving Authority**					
Spec. Sect.	SD Number and Submittal Description	Spec Paragraph Number	Approving Authority	Other Reviewers	Transmittal Control No.	Planned Submittal Date	Action Code	Date of Action	Date Forwarded to App. Auth/ from Contr	Date Forward to Other Reviewer	Date Rcvd from Other Reviewer	Action Code	Date of Action	Date Rcvd from Appx Auth	Remarks
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
33 40 00	Precast concrete mix designs and proportions for each strength and type of concrete used	1.03		E											
	SD-06 Test Reports														
02 81 02	Laboratory waste profiling analysis	3.02	G												
03 30 00	Cast-in-place concrete test results (slump, air content, temperature, chloride content, density and yield, and compressive strength)	1.03													
31 10 00	Compost quality control test report	1.03													
31 23 00	Clean borrow/fill verification analysis	1.04		E											
31 23 00	Fill material density test reports	1.04		E											
32 12 16	Bituminous concrete pavement field and lab test reports	1.02													
33 40 00	Pre-cast concrete plant test reports	1.03		E											
32 92 19 32 93 43	Topsoil nutrient analysis	1.03 1.03	E												
10 88 00	Truck scale calibration test reports	3.02													
	SD-07 Certificates														
01 71 23	Registered Land Surveyor license and qualifications	1.03													
02 81 02	Treatment/disposal facility permits	1.04													
03 30 0	Concrete batch delivery ticket	1.03													
31 23 00	Supplier certification of borrow/fill material	1.04		E											
31 30 00	Certificate of permeability and bentonite content of GCL	1.03		E											
31 30 00	Bentonite QC certificates	2.02													
31 30 00	GCL QC certificates	2.02													
31 30 00	GCL warranty	1.03		E											
31 30 00	GCL manufacturer corporate background and manufacturing capabilities	1.03		E											

EXHIBIT IV-1 - Submittal Register

Contract Task Order No. N4008518F6147 **Contract No. N62470-16-D-9004**	**APTIM Project No. 501164** **Project Title: Site 1 - Former Drum Marshalling Area** **NWIRP Bethpage, New York**	**Revision No. 00** **APTIM Federal Services LLC**

Spec. Sect.	SD Number and Submittal Description	Spec Paragraph Number	Approving Authority	Other Reviewers	Transmittal Control No.	Planned Submittal Date	Contractor Action			Approving Authority				Date Rcvd from Appx Auth	Remarks
							Action Code	Date of Action	Date Forwarded to App. Auth/ from Contr	Date Forward to Other Reviewer	Date Rcvd from Other Reviewer	Action Code	Date of Action		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
31 30 00	GCL installer corporate background information and installed capabilities	1.03		E											
31 37 00	Manufacturer certification of riprap, including specific gravity and gradation	1.03	E												
31 41 16	Manufacturer certification attesting to the rated energy of the proposed hammer for sheet piling installation	1.04													
31 41 16	Manufacturer certification that sheet piling equipment and materials meet ASTM requirements	1.04													
31 41 16	Certificate of sheet piling contractor, design engineer, and welder qualifications	1.04, 1.06													
31 41 16	Copies of all sheet piling permit applications, including calculations and testing required to obtain permit	1.04													
32 12 16	Manufacturer certification of bituminous concrete prime coat	1.02													
32 15 00	Manufacturer certification of aggregate surfacing materials, including grain size distribution	1.02	E												
32 92 19	Manufacturer certification of grass seed, lime, and fertilizer; application rate information	1.03	E												
33 40 00	Manufacturer certification of pre-cast concrete plant for storm drainage utilities	1.03		E											
33 40 00	Pre-cast concrete plant QC Plan	1.03		E											
	SD-08 Manufacturer's Instructions														
10 88 00	Truck scales list of manufacturer's spare parts and complete installation instructions	1.03													

EXHIBIT IV-1 - Submittal Register

Contract Task Order No. N4008518F6147 **Contract No. N62470-16-D-9004**	**APTIM Project No. 501164** **Project Title: Site 1 - Former Drum Marshalling Area** **NWIRP Bethpage, New York**	**Revision No. 00** **APTIM Federal Services LLC**

							Contractor Action			**Approving Authority**					
Spec. Sect.	SD Number and Submittal Description	Spec Paragraph Number	Approving Authority	Other Reviewers	Transmittal Control No.	Planned Submittal Date	Action Code	Date of Action	Date Forwarded to App. Auth/ from Contr	Date Forward to Other Reviewer	Date Rcvd from Other Reviewer	Action Code	Date of Action	Date Rcvd from Appx Auth	Remarks
(a)	**(b)**	**(c)**	**(d)**	**(e)**	**(f)**	**(g)**	**(h)**	**(i)**	**(j)**	**(k)**	**(l)**	**(m)**	**(n)**	**(o)**	**(p)**
	SD-09 Material Suppliers														
31 23 00	Offsite source(s) of borrow/fill material	1.04		E											
	SD-10 Operation and Maintenance Data														
10 88 00	Truck scale operation and maintenance manual	1.03													
	SD-11 Closeout Submittals														
N/A	Construction Completion Report		G												
01 31 00	QC Meeting Minutes	1.06													
N/A	Test Results Summary Report														
N/A	Daily Contractor Production Reports														
N/A	Daily QC Reports														
N/A	Rework Items List														
N/A	Documentation Photos														
01 71 23	Surveyor field notes, computations, data logger information, and other survey records	1.03													
01 71 23	Record survey drawings certified by RLS (AutoCAD computer file, PDF file, one hard copy)	1.03, 3.03		E											

EXHIBIT IV-1 - Submittal Register

Contract Task Order No. N4008518F6147 **Contract No. N62470-16-D-9004**	**APTIM Project No. 501164** **Project Title: Site 1 - Former Drum Marshalling Area** **NWIRP Bethpage, New York**	**Revision No. 00** **APTIM Federal Services LLC**

Spec. Sect.	SD Number and Submittal Description	Spec Paragraph Number	Approving Authority	Other Reviewers	Transmittal Control No.	Planned Submittal Date	Contractor Action			Approving Authority				Date Rcvd from Appx Auth	Remarks
							Action Code	Date of Action	Date Forwarded to App. Auth/ from Contr	Date Forward to Other Reviewer	Date Rcvd from Other Reviewer	Action Code	Date of Action		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
01 77 00	Certification of work complete	1.05	G												
01 77 00	Final Application for Payment, warranties, as-built documentation	1.06	G												
02 01 51	Post-construction maintenance inspection/repair reports	1.02, 1.09	E												
02 81 02	Waste shipment manifests, original bills of lading, and material shipping records	3.03		G, E											
03 30 00	Hardcopy delivery tickets for each batch of concrete	1.03													
31 30 00	GCL QC Certificates and roll tags	2.02													
31 41 16	Record copy of each sheet pile driven, including pile mark number, driving resistance record, pile length as driven, date and time of driving, time delays during driving, tip and cut-off elevations, deviations from drawing location and from plumb, hammer data and any other applicable data.	1.05													
31 41 16	Survey drawing showing mark number of all sheet piles and as-driven locations, within two weeks of completion of sheet piling installation	1.05, 1.08													
32 92 19	Bag tags, receipts and truck weight tickets of all seed, lime, and fertilizer	1.03	E												
33 40 00	Survey drawings showing location of installed storm drainage utilities	1.03		E											

Notes:
Approved By:
G: Government
E: Engineer
TOB: Town of Oyster Bay
Blank: QC Manager
Reference; QMP-16.2 Submittal Management Process

ACTION CODES
A: Approved
AN: Approved as Noted

NR: Not Reviewed
RR: Disapproved; Revise and Resubmit

EXHIBIT IV-2

LIST OF PERSONNEL AUTHORIZED TO REVIEW AND CERTIFY SUBMITTALS APTIM Federal Services LLC Site 1 - Former Drum Marshalling Area NWIRP Bethpage Contract Task Order No. N4008518F6147		
	SUBMITTAL TYPE:	AUTHORIZED PERSONNEL:
Work Plan Submittals	Preconstruction	Project Manager, FEAD, RPM
Work Plan or Construction	All Types	Project QC Manager, QC Program Manager, and Project Manager, FEAD, RPM

(1) Note: Submittals requiring Government approval - QC Manager shall perform the final review and certification.
Submittals requiring Contractor approval - QC Manager shall perform the final review and approval.

EXHIBIT V-1

TESTING PLAN AND LOG
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

CONTRACT NUMBER	PROJECT TITLE: Site 1 - Former Drum Marshalling Area	
N62470-16-D-9004	LOCATION: NWIRP Bethpage, New York	

WORK PLAN SECTION AND PARAGRAPH NUMBER	SPECIFICATION SECTION AND PARAGRAPH NUMBER	ITEM OF WORK	TEST REQUIRED	ACCREDITED/ APPROVED LAB		SAMPLED BY	TESTED BY	LOCATION OF TEST		DATE COMPLETED	DATE FORWARDED TO CONTR. OFF.	REMARKS
				YES	NO			ON SITE	OFF SITE			
WP 5.6 SAP	32 92 19	Clean Fill Verification	VOCs, SVOCs, PCBs, TCL Metals, Pesticides	X					X			VOC samples will be collected at a rate of seven discrete grab samples for the first 1,000 cubic yards, and an additional two discrete grab samples for each additional 1,000 cubic yards. All other analytes will require two composite samples for the first 1,000 cubic yards, and an additional composite sample for each additional 1,000 cubic yards.
WP 6.9	32 92 19	Top Soil Verification	Soil nutrient analyses (calcium, chloride, magnesium, nitrate, phosphorous, potassium, sodium, sulfate, pH, salinity, TOC)	X					X			One sample per disturbed acre

EXHIBIT V-1

TESTING PLAN AND LOG
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

CONTRACT NUMBER	PROJECT TITLE: Site 1 - Former Drum Marshalling Area
N62470-16-D-9004	LOCATION: NWIRP Bethpage, New York

WORK PLAN SECTION AND PARAGRAPH NUMBER	SPECIFICATION SECTION AND PARAGRAPH NUMBER	ITEM OF WORK	TEST REQUIRED	ACCREDITED/ APPROVED LAB		SAMPLED BY	TESTED BY	LOCATION OF TEST		DATE COMPLETED	DATE FORWARDED TO CONTR. OFF.	REMARKS
				YES	NO			ON SITE	OFF SITE			
WP 6.6 SAP	02 81 02 Part 3.02	Waste Characterization Sampling	PCBs, ignitability, corrosiveness, reactivity, TCLP metals, TCL VOCs, TCL SVOCs, pesticides, herbicides	X					X			Soil: One five-point composite sample will be collected per 500 cubic yards of soil excavated. Concrete: One discrete grab sample will be collected per 500 cubic yards of concrete removed using a hammer and chisel or hammer drill. Water: One discrete grab sample will be collected per 20,000 gallon storage tank of containerized decontamination water.
N/A	03 30 00 Part 1.03	Cast-in-place Concrete Sampling and Testing	- Slump by ASTM C 143-12 - Air content by ASTM C 138-13a, ASTM C 173-12, or ASTM C 231 - Temperature by ASTM C 1064-12 - Density and yield by ASTM C 138-13a - Compressive strength by ASTM C 39-12a		X			X				To be performed at a frequency of one set of tests per 50 cubic yards of concrete, or one day's production, whichever is less
N/A	03 30 00 Part 1.03	Cast-in-place Concrete Sampling and Testing	Chloride content	X					X			To be performed at a frequency of one test per 50 cubic yards of concrete, or one day's production, whichever is less

EXHIBIT V-1

TESTING PLAN AND LOG
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

CONTRACT NUMBER	PROJECT TITLE: Site 1 - Former Drum Marshalling Area
N62470-16-D-9004	LOCATION: NWIRP Bethpage, New York

WORK PLAN SECTION AND PARAGRAPH NUMBER	SPECIFICATION SECTION AND PARAGRAPH NUMBER	ITEM OF WORK	TEST REQUIRED	ACCREDITED/ APPROVED LAB		SAMPLED BY	TESTED BY	LOCATION OF TEST		DATE COMPLETED	DATE FORWARDED TO CONTR. OFF.	REMARKS
				YES	NO			ON SITE	OFF SITE			
WP 6.1	31 10 00 Part 3.06	Compost Quality Control Testing	UCC TMECC 02.02-B UCC TMECC 03.08-A UCC TMECC 05.07-A Moisture Content	X					X			Testing frequency shall be one sample per 2,000 cubic yards of compost material.
WP 6.8	31 23 00 Part 3.01	Fill Material Density Tests	ASTM D 6938 ASTM D 2937		X			X				- Perform an ASTM D 2937 density test at the start of the job, and for every five-acre area on which common fill is placed. - Fill placement: Three tests for every 20,000 square feet per lift. - Lift thickness shall be measured in each lift.
WP 6.8	31 23 00 Part ##	Compaction	ASTM D 698		X			X				Moisture condition soil as required; spread soil in 8-inch maximum loose lifts
WP 6.10	32 12 16 Part 3.04	Site Restoration	ASTM D 2950 - Density of Bituminous Concrete in Place by Nuclear Methods		X			X				One ASTM D 2950 Nuclear Method test shall be performed on each 1,000 square feet of binder course and each 1,000 square feet of surface course placed.

EXHIBIT VII-1

REWORK ITEMS LIST
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

Contract No. N62470-16-D-9004

Site 1 - Former Drum Marshalling Area

Location: NWIRP Bethpage, New York

NUMBER	DATE IDENTIFIED	DESCRIPTION	CONTRACT REQUIREMENT (Spec. Section and Par. No., Drawing No. and Detail No., etc.)	ACTION TAKEN BY QC MANAGER	RESOLUTION	DATE COMPLETED

EXHIBIT IX-1

QUALITY CONTROL INSPECTION PLAN
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

Specification/ Work Plan Section	Definable Feature of Work	Subtasks	Quality Objectives to be Verified	Control Check Verification					
				Date	Preparatory Phase Checklist/Report No.	Date	Initial Phase Checklist/Report No.		Follow-up Phase Checklist/Report No.
01 50 00 Part 1.03 WP 5.3	**Mobilization**	Mobilization	*Verify movement of equipment, materials, and field personnel to the project site.						
			*Orientation and training of field personnel.						
01 50 00 WP 5.4	**Site Preparation**	Preconstruction Survey	*Verify surveyor is licensed in the state of New York.						
			*Verify preconstruction survey defines existing site conditions.						
		Temporary Construction Facilities	*Verify temporary facilities located as agreed upon at pre-construction meeting.						
		Site Security / Exclusion Zones	*Site perimeter established using high-visibility and/or chain link fencing with required signage.						
			*Inspect regularly and repair as necessary.						
		Equipment Decontamination Area	*Verify the equipment decontamination area is installed IAW the HASP.						
		Utility Survey	*Submit application for excavation permit to FEAD representative.						
			*Verify completion of utility survey and markout.						
			*Submit utility survey to FEAD representative.						
			*Verify locations of the utilities; ensure underground utilities that will be impacted by soil removal are protected.						
		Material Handling and Storage Areas	*Inspect construction of excavated materials stockpile area.						
			*Ensure staged soil is covered.						
		Clean Fill Verification Sampling	*Sample clean fill and topsoil IAW Exhibit V-1.						
		Photographic Documentation	*Ensure photographs are taken during each feature of work.						
			*Sort electronic photographs and maintain project photo log.						

EXHIBIT IX-1

QUALITY CONTROL INSPECTION PLAN
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

Specification/ Work Plan Section	Definable Feature of Work	Subtasks	Quality Objectives to be Verified	Control Check Verification					
				Preparatory Phase		Initial Phase		Follow-up Phase	
				Date	Checklist/Report No.	Date	Checklist/Report No.		Checklist/Report No.
01 50 00 WP 5.4 (cont.)	**Site Preparation (cont.)**	Permits	*Verify hot work permit obtained prior to performing any hot work.						
			*Verify street opening permit, partial street closure permit, and weight permit are obtained prior to implementing the site traffic control plan.						
WP 5.4.5	**Utility Relocation**	Utility Relocation	*Coordinate with utility providers to relocate utilities within excavation area and minimize impact to nearby businesses.						
31 10 00 WP 6.1	**Site Clearing**	Clearing Activities	*Verify trees and vegetation have been removed to an adequate distance to allow for safe equipment movement within and around the excavation area.						
10 88 00 WP 5.4.2.3	**Truck Scale Operation**	Truck Scale Operation	*Verify truck scale is installed and operated IAW Project Specifications.						
31 41 16 WP 6.3	**Installation of Sheet Piling**	Installation of Sheet Piling	*Verify sheet piles are installed in accordance with the approved Sheet Piling Installation Plan.						
01 57 13 31 35 20 31 37 00 WP 5.4.4	**Erosion Control**	Erosion and Sediment Control Measures	*Verify E&S controls are installed IAW the ESCP.						
32 17 20 Traffic Control Plan	**Work Zone Traffic Control**	Site Traffic Control	*Establish defined routes for material handling and movement around the site IAW the Traffic Control Plan.						
			*Where necessary, spotters used to guide heavy equipment and vehicles transporting materials in tight work areas.						
31 23 00 44 11 23 WP 6.4	**Excavation**	Contaminated Soil Removal	*Verify excavation area location and layout.						
			*Verify excavation extents and depths are achieved via field measurements.						
			*Verify dust control measures are implemented as necessary during excavation activities.						
			*Ensure excavation is benched in order to maintain a cut slope of less than or equal to 2:1.						

EXHIBIT IX-1

QUALITY CONTROL INSPECTION PLAN
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

Specification/ Work Plan Section	Definable Feature of Work	Subtasks	Quality Objectives to be Verified	Control Check Verification					
				Date	Preparatory Phase Checklist/Report No.	Date	Initial Phase Checklist/Report No.		Follow-up Phase Checklist/Report No.
31 23 00 44 11 23 WP 6.4 (cont.)	**Excavation (cont.)**	Excavated Material Staging	*Ensure roads are kept clear of loose dirt and debris.						
31 30 00 WP 6.5	**Installation of Geosynthetic Clay Liner**	Installation of Geosynthetic Clay Liner	*Verify installation of geosynthetic clay liner IAW Project Specifications.						
31 23 00 WP 6.8	**Backfilling**	Fill Material	*Verify all fill material sources have been approved.						
		Common Fill	*Verify excavation is backfilled to within 6 inches of final grade.						
		Topsoil	*Ensure placement of 6-inch top soil layer to support vegetative growth.						
02 81 02 Part 3.02 WP 6.6	**Waste Characterization Sampling**	Waste Characterization Sampling	*Sample excavated soil IAW Exhibit V-1.						
02 81 02 WP 6.7	**Transportation and Disposal**	Soil Disposal	*Verify acceptance of disposal facilities.						
		Concrete, Asphalt and Metal Recycling	*Verify acceptance of recycling facility.						
		Water Disposal	*Verify acceptance of disposal facility.						
		Documentation	*Verify acceptance of waste profile.						
			*Confirm that waste manifests are completed accurately and accompany each load of waste.						
		Transportation	*Inspect transport vehicle prior for DOT road worthiness prior to loading and departing off site.						
			*Ensure roads are kept clear of loose dirt and debris.						
32 93 43 32 92 19 WP 6.9.2	**Tree Planting**	Tree Planting	*Verify replacement of removed trees with similar native species and quantity.						
		Seeding	*Ensure all disturbed areas are stabilized with native grass seed.						
32 31 13 WP 6.9.3	**Site Fencing**	Site Fencing	*Verify the site is enclosed in chain link fence and gate IAW Project Specifications.						
01 77 00 WP 6.9.5	**Haul Road Restoration**	Haul Road Restoration	*Ensure that the haul road connecting to Aerospace Boulevard is restored to its former condition.						
32 12 16 32 15 00 WP 6.9	**Bituminous Concrete Pavement and Aggregate Surfacing**	Bituminous Concrete Pavement and Aggregate Surfacing	*Verify concrete and aggregate material properties are IAW Project Specifications.						
			*Ensure paved areas are restored IAW Project Specifications.						
02 01 51 WP 6.10	**Post Construction Maintenance**	Bi-Annual Mowing	*Ensure the site is mowed twice during the first year, in April and October.						

EXHIBIT IX-1

QUALITY CONTROL INSPECTION PLAN
APTIM Federal Services LLC
Site 1 - Former Drum Marshalling Area
NWIRP Bethpage
Contract Task Order No. N4008518F6147

Specification/ Work Plan Section	Definable Feature of Work	Subtasks	Quality Objectives to be Verified	Control Check Verification					
				Date	Preparatory Phase Checklist/Report No.	Date	Initial Phase Checklist/Report No.		Follow-up Phase Checklist/Report No.
02 01 51 WP 6.10 (cont.)	**Post Construction Maintenance (cont.)**	Monthly Inspections (Year 1)	*Ensure monthly inspections are conducted during the first year of O&M.						
		Quarterly Inspections (Year 2)	*Ensure quarterly inspections are conducted between months 13 and 30 of O&M.						
		Rain Inspections	*Ensure the site is inspected following each rainfall event that meets or exceeds 0.5 inches over a 24-hour period.						
		Fence Maintenance	*Ensure fences are repaired to maintain the standards in Project Specifications.						
		E&S Maintenance	*Ensure E&S controls are maintained IAW Project Specifications.						
		Soil/Vegetation Repair	*Ensure soil and vegetation is maintained IAW the Site Restoration Plan.						
01 77 00 WP 6.11	**Demobilization**	Demobilize Personnel and Equipment	*Verify approval to remove E&S controls.						
			*Ensure removal of all E&S controls.						
			*Verify proper equipment decontamination.						
			*Verify completion of site cleanup, removal of temporary facilities, materials, debris, and equipment off site.						
			*Final Inspection and acceptance of final site conditions.						

EXHIBIT X-1

PERSONNEL MATRIX APTIM Federal Services LLC Site 1 - Former Drum Marshalling Area NWIRP Bethpage Contract Task Order No. N4008518F6147			
SPECIFICATION SECTION	SUBMITTALS TO BE REVIEWED BY:	THREE PHASE TO BE PERFORMED BY:	TESTING TO BE VERIFIED BY:
All Sections	Project QC Manager (1), QC Program Manager, Project Manager, RPM, or FEAD	Project QC Manager	Project QC Manager

(1) Note: Submittals requiring Government approval - Site QC Manager shall perform the initial review and certification.
Submittals requiring Contractor approval - Site QC Manager shall perform the final review and approval.

Appendix D
Environmental Protection Plan

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FINAL
ENVIRONMENTAL PROTECTION PLAN
Site 1 – Former Drum Marshalling Area
Naval Weapons Industrial Reserve Plant
Bethpage, New York

Contract Number: N62470-16-D-9004

Contract Task Order: N4008518F6147F6147

Document Control Number: APTIM-9004-F6147-0006

September 2019

Submitted to:

NAVFAC Mid-Atlantic
Gilbert Street, Building N26
Norfolk, VA 23511

Submitted by:
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150 Boush Street, Suite 701
Norfolk, Virginia 23510

FINAL
ENVIRONMENTAL PROTECTION PLAN
Site 1 – Former Drum Marshalling Area
Naval Weapons Industrial Reserve Plant
Bethpage, New York

Contract Number: N62470-16-D-9004

Contract Task Order: N4008518F6147

Document Control Number: APTIM-9004-F6147-0006

September 2019

Prepared by: _____ Date: September 30, 2019
Arianne Reyes, E.I.T.
Engineer

Approved by: _____ Date: September 30, 2019
William L. Deane, Jr., P.E.
Program Manager

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Table of Contents

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Acronyms and Abbreviations

APP	Accident Prevention Plan
APTIM	Aptim Federal Services, LLC
CM	Construction Manager
COR	Contracting Officer's Representative
EPP	Environmental Protection Plan
NWIRP	Naval Weapons Industrial Reserve Plant
OU	Operable Unit
QC	Quality Control
RAM	Real-time air monitor
ROD	Record of Decision
SDS	Safety Data Sheet
SSHO	Site Safety and Health Officer
SWPPP	Storm Water Pollution Prevention Plan
USEPA	U.S. Environmental Protection Agency

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1.0 Introduction

This Environmental Protection Plan (EPP) presents the environmental protection and pollution measures undertaken by Aptim Federal Services, LLC (APTIM) and its subcontractors while performing the remedial action. All work will be conducted in accordance with the Operable Unit (OU) 4 Record of Decision (ROD) (Navy, 2018) under Contract Task Order F6147, Contract Number N62470-16-D-9004.

APTIM will implement procedures and supply materials necessary for environmental protection for activities associated with the removal activities at Site 1. Principal concerns include small spills (e.g. fuel spills) and erosion and sediment controls. Additional information may be found in the *Accident Prevention Plan (APP) for Site 1 – Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New Yor*k (APTIM, 2018a) and the *Storm Water Pollution Prevention (SWPPP) Plan for Site 1 - Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New Yor*k (APTIM, 2018c).

1.1 Project Summary Scope of Work

The objective of the remedial action is to address polychlorinated biphenyl contaminated soils located at depths varying from ground surface to 30-feet below ground surface. This work will consist of utility relocation, excavation, and installation of a reduced permeability cover. The cover will reduce leaching of contaminants from unsaturated soil to groundwater.

This work will be performed in compliance with federal, state, and local regulations as they pertain to the environment. The work plan was developed in accordance with the OU 4 ROD (Navy, 2018) and the *Specifications for Site 1 – Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New York* (Tetra Tech, 2019).

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2.0 Project Personnel

All on-site personnel will be briefed by the Construction Manager (CM), Project Quality Control (QC) Manager, or designated personnel on the details of the EPP prior to commencing construction activities. APTIM and its subcontractors will attend initial training for all site personnel in the operating and maintenance of equipment to prevent the discharge or spill of fuels, oils, lubricants, or other hazardous materials. Additionally, control measures for the management of excavated soil will be addressed. The following personnel are responsible for providing EPP training:

- CM
- Project QC Manager

In the event that either the CM or Project QC Manager cannot provide EPP training, either manager can designate an approved alternate trainer.

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3.0 Site Corrective Action

Should any of the preceding provisions not satisfy contractual standards (established in the OU4 ROD (Navy, 2018); prompt action will be taken to correct the situation upon receipt of notification from the Contracting Officer's Representative (COR) or from the APTIM CM. Corrective measures will be proposed in writing to the COR for review and approval prior to being implemented.

Situations requiring immediate corrective action will be discussed with the COR and implemented as soon as possible. Written documentation of the action will be submitted to the COR within 24-hours of implementing the action.

Deficiencies identified for corrective action shall be noted on AMS-710-05-FM-01601, "HSE Corrective Action Tracking Register", which will include the following:

- Date deficiency/finding is identified
- Description of deficiency/finding
- Identification if deficiency/finding is an imminent hazard
- Corrective action plan
- Name of person responsible for action to correct deficiency
- Targeted corrective action date
- Date deficiency/finding corrective action completed
- Name of person approving the corrective action

The identified deficiencies with recommended corrective actions shall be conveyed to the responsible party (APTIM or subcontractor) for appropriate mitigation. All imminent hazard deficiencies/findings found during inspections shall be immediately corrected. All deficiencies and corrective actions must be noted on the Corrective Action Tracking Register, even if the deficiency was corrected immediately. It is the CM's and project manager's responsibility to ensure all deficiencies found during inspections are corrected in a timely manner.

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4.0 Storm Water Management and Erosion Control

All project work is anticipated to be performed in, or immediately adjacent to, well-developed areas. Construction runoff shall be controlled in such a manner to prevent migration from the site using a rock construction entrance, temporary seeding and mulch, storm drain inlet protection, and compost filter sock. Details, locations, and best management practices of specific erosion control features are identified in the Erosion and Sediment Control Plan of the SWPPP (APTIM, 2018c).

Except for designated work areas, the site will be preserved in its original condition. Temporary equipment and material storage areas will be identified and approved by the facility and the COR. Excavation activities will be conducted in a manner that minimizes environmental impact and protects the surrounding areas from being disturbed. Precautions to be taken to minimize impact will include, but are not limited to, the following:

- All heavy equipment and vehicle operations will be limited to designated roadways and predetermined routes.
- Debris from work activities will be collected daily.
- Proper guidance will be provided to heavy equipment operators to minimize impact to designated work areas. Equipment will be maintained such that dirt and debris will not be excessively spread onto roadways. An exclusion zone for equipment, vehicle, and personnel dry decontamination will be designated on the temporary haul road entering/exiting the removal area.

During excavation activities:

- Excavated soils will be placed in designated materials handling areas constructed as described in Section 5.4.7.
- The stockpile and equipment laydown area will be covered daily to prevent erosion of the stockpile and will control fugitive dust emissions or soil drift.

Additional erosion and sediment controls for Site 1 can be found in the SWPPP (APTIM, 2018c).

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5.0 Contamination Prevention Plan

All reporting requirements established for hazardous chemicals in accordance with the Emergency Planning and Community Right-to-Know Act regulation (U.S. Environmental Protection Agency [USEPA], 1998), and also known as Title III of the Superfund Amendments and Reauthorization Act of 1986, will be followed at the project site. Safety Data Sheets (SDS) of any hazardous chemicals used for this project, if any, meeting the Emergency Planning and Community Right-to-Know Act requirements, will be filed in APTIM's site trailer and will be updated regularly on-site. SDS's will include the following:

- Trade and/or chemical name
- Chemical abstract service number
- Classification
- Reportable quantity
- Maximum volume at the project site
- Average daily volume at the project site
- Total volume throughout the project

Hazardous substances will be stored in accordance with applicable regulations in an area approved by the Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage representative. NWIRP Bethpage representatives will be notified of expected use of any extremely hazardous substances. SDS's will be maintained on-site at all times for each material in accordance with Engineering Manual 385-1-1 (U.S. Army Corps of Engineers, 2014).

Employees will be trained to work safely with hazardous chemicals. Employee training will include the following:

- Methods that may be used to detect a release of a hazardous chemical in the workplace
- Physical and health hazards associated with chemicals
- Protective measures to be taken
- Safe work practices, emergency responses, and use of Personal Protective Equipment
- Information on the Hazard Communication standard including:

- Labeling and warning system
- An explanation of SDS's

Employees working with a hazardous chemical may request a copy of the SDS. Requests for SDS's should be made to the Site Safety and Health Officer (SSHO). Any suspected or known leak or spill of these materials will be handled in accordance with Section 6.0 Spill Control, in such a manner as to prevent their introduction into the water or ground. In the event of a suspected airborne release, APTIM will monitor and measure the airborne contaminant with the appropriate air-sampling device as selected by the SSHO. Additionally, the SSHO will revise the Personal Protective Equipment required as needed. APTIM will inform bases representatives in a timely manner of a suspected or known release. All measures will be employed to contain and remove any airborne contaminant.

6.0 Spill Control

Construction activities will be conducted in a manner to prevent fuels, oils, grease, and any other contaminated material from entering the ground or drainage areas. Absorbent material will be available for quick response to any release of fluids other than clean water.

In the event a leak occurs in these areas, absorbents will be used to prevent runoff. Ensuring that all contaminated waste is stored, handled, and transported on and off-site properly will protect water resources. Spill prevention control measures include proper equipment maintenance, and fueling of equipment in a limited area. In the event of a petroleum spill, the following procedures will be initiated.

Spill response reaction:

- Project personnel will stop the source of the spill, deactivate all applicable power sources, and/or activate all emergency stop buttons.
- Project personnel will isolate and secure the area and call the appropriate base representatives as directed by the COR.
- Absorbents will be placed to clean up all products and prevent further spread of contamination.
- All absorbent materials must contained in Department of Transportation-approved, open-top drums.
- All absorbent materials and fluids must be assumed contaminated until demonstrated otherwise.
- Drums shall be clearly marked according to contents, accumulation date, and known or suspected hazard(s). Drums shall be marked “Pending Analysis” until such time as results have been received from the laboratory. The 90-day hazardous waste accumulation area will be coordinated with the base hazardous waste manager.
- Drums shall be closed and sealed at the end of each day. Spill cleanup supplies will be maintained on site for use in an emergency.
- Drums shall be segregated into a separate, marked holding area.
- Samples of the spill residue and materials used in the spill cleanup must be collected.
- Materials shall be disposed of in accordance with USEPA requirements.

- Copies of the sample analysis and a letter stating the disposition and location of the disposal will provided to the COR and the facility.

Additional information on spill prevention and control can be found in the APP (APTIM, 2018c).

7.0 Air Pollution Control

The following section outlines the air pollution control measures that APTIM will implement throughout the project.

7.1 Dust Monitoring and Control

APTIM project personnel will take mitigation measures during construction and site preparation to control fugitive dust discharge as not to cause injury, detriment, or nuisance to the surrounding environment. Upwind, on-site, downwind, and perimeter/neighborhood dust conditions will be visually monitored by the SSHO, and/or the CM. The two major contributing factors to materials becoming airborne are high wind speeds and unsecured materials. To mitigate this, APTIM will require all materials to be properly stored and disposed daily when necessary. Additionally, wind speed will be monitored continuously using a dedicated weather station at the field trailer and with hand-held wind meters in the field. Field operations will be evaluated if wind exceeds 25-miles per hour. Due to the hazardous nature of the contaminants and concentrations on-site, one 4,000-gallon capacity water truck will be used for dust suppression. Care shall be taken during water application to avoid over-saturation of materials and generation of runoff.

Air monitoring of dust will be conducted in accordance with the Site Safety and Health Plan, found in Appendix B of the APP (APTIM, 2018a). Real-time aerosol monitors (RAMs) will be used to measure particulate matter (dust) concentrations in air, and all direct readings will be documented on AMS-710-01-FM-00101, "Air Monitoring Data Sheet" (APP Appendix F [APTIM, 2018a]). RAMs will be zeroed as required, prepared for operation, operated, and maintained each day as recommended by the manufacturer and according to AMS-710-02-PR-02600, "Safety Instrument Calibration." The instrument check data shall be recorded in the AMS-710-02-FM-02602, "Safety Instrument Calibration Report" (APP Appendix F [APTIM, 2018a]).

RAMs registering dust concentrations at or above 100 micrograms per cubic meter ($\mu g/m^3$) greater than background (upwind perimeter) and areas where personnel are working, for the 15-minute period or if airborne dust is observed leaving the work area, require that additional dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 $\mu g/m^3$ above the upwind level and provided that no visible dust is migrating from the work area.

If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 $\mu g/m^3$ above the upwind level, work must be stopped, and a re-evaluation of

activities must be initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 $\mu g/m^3$ of the upwind level and in preventing visible dust migration.

Indirect air sampling (time-integrated) personal and area air sampling will also be conducted to verify direct-reading instrumentation results and to determine compliance with federal regulations. Air monitoring will be measured upwind, on-site, and downwind, as well as at the perimeter to monitor any migration of dust off-site.

If it is determined that water dust control methods are insufficient, APTIM will stop work immediately and additional dust control alternatives will be evaluated, including tackifying applications such as Gorilla Snot. Refer to the Site Safety and Health Plan (APP Appendix B [APTIM, 2018a]), for more detailed information on air monitoring and dust control.

7.2 Emission Monitoring and Control

Heavy equipment exhaust will have the potential to produce visible emissions. The use of appropriate grades of diesel fuel and lubricated oil in heavy equipment will be implemented to reduce visible emissions.

8.0 Noise Control

Due to the proximity of the site to developed neighborhoods, levels of noise from the project will be mitigated. Noise levels will be managed by utilizing appropriate noise control on equipment and by complying with required work hour restrictions, proposed to be 0700 – 1700 daily. Vehicles and equipment to be used on-site will have appropriate noise reduction and protection devices that conform the Occupational Safety and Health Administration standard to include 29 Code of Federal Regulations 1926.52, and other applicable local noise ordnance requirements.

The SSHO or designee(s) shall conduct site perimeter noise level surveys with a sound level meter and personal noise dosimetry with noise dosimeters as required by AMS-710-01-PR-00100, "Industrial Hygiene Sampling Methods" (APP Appendix G [APTIM, 2018a]). Noise levels shall not exceed 85 decibels at any site boundary. The required noise controls and hearing conservation procedures are specified in Section 10.1.1 and AMS-710-01-PR-00900, "Noise Control and Hearing Conservation" (APP Appendix G [APTIM, 2018a]). The SSHO is responsible for maintaining all noise monitoring records.

For work performed near the property boundary or near inhabited areas, APTIM will consider additional noise mitigation measures if warranted by off-site property uses. Noise mitigation measures shall include, but shall not be limited to, utilizing noise control devices, limiting night work hours for noisy activities, and scheduling and controlling traffic. APTIM will coordinate with Naval Facilities Engineering Command to revise work procedures and hours as needed to address noise complaints, if received.

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9.0 Emergency and Decontamination Equipment

The following sections describe decontamination procedures, temporary measures, and best management practices that will be implemented at the site.

9.1 Small-Scale Emergency Equipment

Small scale emergency equipment used on site will include the following equipment:

- First aid kit
- Bloodborne pathogen infection control kit
- 15-minute emergency eyewash station meeting American National Standards Institute/International Safety Equipment Association Z358.1-2009, Emergency Eyewash and Shower Equipment, specifications that is capable of delivering at least 0.4 gallons per minute of water available in the work area when there is potential for eye contact with hazardous chemicals
- Emergency shower meeting American National Standards Institute/International Safety Equipment Association Z358.1-2009, Emergency Eyewash and Shower Equipment, specifications available in the work area when there is potential for skin contact with corrosive or acutely toxic chemicals
- Emergency contact list with important telephone numbers (Table 4 of APP [APTIM, 2018a])
- Cellular telephones for emergency communications carried by all safety personnel, supervisory personnel, and at least one person in each work crew
- Spill control equipment, including:
    - Absorbent pads
    - Granular absorbent material (noncombustible)
    - Polyethylene sheeting
    - Shovels and assorted hand tools

    - Five-gallon buckets

- Fire extinguisher with a minimum rating of 4-A:60-B:C in all active work areas, vehicles, and fueling areas

- Decontamination equipment

This equipment will be identified to, and available to, all onsite workers.

9.2 Large-Scale Emergency Equipment

Large-scale emergency equipment will be utilized only if such size and/or power are necessary.

9.3 Decontamination of Equipment

Equipment necessary for decontamination activities will be provided, installed, and verified in working order prior to site operations. Equipment in the decontamination area includes items such as brushes and waste containers, power washers, and/or equipment suitable for dry decontamination procedures.

The decontamination area will be used to remove site materials such as dirt and mud from vehicles prior to accessing a public roadway. Equipment contacting known or suspected contaminant-impacted material shall be decontaminated at the work area prior to relocation to the support zone.

Decontamination water will be pumped from the decontamination pad using a six-in. diesel pump with a 25-ft. hose through a 10-oz. filter bag to be stored in a 20,000-gallon portable storage tank. Prior to off-site disposal, stored decontamination water will be sampled for waste characterization analysis.

A list of decontamination equipment and supplies can be found in Table 1 of the APP (APTIM, 2018a).

10.0 Equipment Maintenance

Construction equipment will be properly maintained to ensure safe operation. All equipment will be regularly inspected and maintained (and documented in the inspection/maintenance log) in such manner as to minimize spillage or leakage which may occur during on site use or transportation.

Before any machinery or mechanized equipment is placed in use, it shall be inspected and tested in accordance with the manufacturer's recommendations and shall be certified in writing by a competent person to meet the manufacturer's recommendations. Subsequent re-inspections will be conducted at least annually thereafter. These inspections shall be documented on the "USACE Safety Inspection Checklist for Construction Equipment" (APP Appendix F [APTIM, 2018a]). All safety deficiencies noted during the inspection shall be corrected prior to the equipment being placed in service at the project. If at any time the machinery or mechanized equipment is removed and subsequently returned to the project (other than equipment removed for routine off-site operations as part of the project), it shall be re-inspected and recertified prior to use.

All heavy equipment shall be inspected by each operator prior to use on the project and shall then be inspected on a daily basis. Daily inspections shall be documented on AMS-710-02-FM-05701, "Mechanized and Marine Equipment Inspection Report" (APP Appendix F [APTIM, 2018a]). Deficiencies in the equipment shall be noted on the form. All inspection documentation shall be submitted to the SSHO prior to using the equipment if safety deficiencies are observed and at the end of the day if no safety deficiencies are observed.

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11.0 Housekeeping

APTIM employs housekeeping policies in which neat and orderly storage of materials, proper truck and tank placards, prompt removal of spillage, refuse pickup and disposal, maintenance of roads and surfaces, and provisions for the storage of material. A daily departure inspection will be performed by the Site Superintendent/CM.

Small spills may include solid or liquid materials being mishandled, dumped, leaked, knocked over, etc. Any material spillage, except for excavation material within the limits of excavation or storage, will immediately be contained and collected for disposal. Spills will be reported to the Navy Remedial Project Manager as necessary. Excavation will be performed such that source materials within the excavation or staging areas will be contained within appropriate staging areas or the excavation itself during construction activities, and covered at the end of each work day and secured. Any spilled liquids will be contained and collected by absorbent materials. Spilled fuel and impacted soil will be collected and staged for disposal.

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12.0 Waste Handling

Any transportation and disposal activities will be performed in accordance with local, state, and federal regulations as well as Navy contract requirements. Additional waste management procedures are discussed in the Waste Management Plan provided as an appendix to the *Remedial Action Work Plan for Site 1 – Former Drum Marshalling Area, Naval Industrial Reserve Plant Bethpage, Bethpage, New York* (APTIM, 2018b).

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13.0 References

APTIM, 2018a. *Accident Prevention Plan for Site 1 – Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New Yor*k, (draft) August.

APTIM, 2018b. *Remedial Action Work Plan for Site 1 - Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New Yor*k, (draft) August.

APTIM, 2018c. *Storm Water Pollution Prevention Plan for Site 1 - Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New Yor*k, (draft) August.

Navy, 2018. Operable Unit 4 Record of Decision, Naval Weapons Industrial Reserve Plant, Bethpage, New York.

Tetra Tech, 2019. *Specifications for Site 1 – Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New York,* May 25.

U.S. Army Corps of Engineers, 2014. Safety and Health Requirements Manual Engineering Manual 385-1-1.

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Appendix E
Waste Management Plan

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FINAL
WASTE MANAGEMENT PLAN
Site 1 – Former Drum Marshalling Area
Naval Weapons Industrial Reserve Plant
Bethpage, New York

Contract Number: N62470-16-D-9004
Contract Task Order: N4008518F6147

Document Control Number: APTIM-9004-F6147-010

September 2019

Submitted to:

NAVFAC Mid-Atlantic
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FINAL
WASTE MANAGEMENT PLAN
Site 1 – Former Drum Marshalling Area
Naval Weapons Industrial Reserve Plant
Bethpage, New York

Contract Number: N62470-16-D-9004
Contract Task Order: N4008518F6147

Document Control Number: APTIM-9004-F6147-010

September 2019

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Approved by: _____ Date: September 30, 2019
William L. Deane, Jr., P.E.
Program Manager

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Table of Contents

List of Attachments

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Acronyms and Abbreviations

AOC	Area of Concern
APTIM	Aptim Federal Services, LLC
CFR	Code of Federal Regulations
COC	Contaminants of Concern
ft.	feet
IDW	Investigation Derived Waste
NAVFAC	Naval Facilities and Engineering Command
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
OU	Operable Unit
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PPE	Personal Protective Equipment
ppm	parts per million
PWS	Performance Work Statement
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SVOC	Semi-Volatile Organic Compound
TAGM	Technical and Administrative Guidance Memorandum
TCL	Target Compound List
TSCA	Toxic Substances Control Act
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WMP	Waste Management Plan

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1.0 Introduction

This Waste Management Plan (WMP) describes the approach undertaken by Aptim Federal Services, LLC (APTIM) and its subcontractors while performing the remedial action. The remedial action is being performed for the U.S. Department of the Navy (Navy) Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic, under Contract No. N62470-16-D-9004, Contract Task Order N4008518F6147. This work is being performed under the Navy Environmental Restoration Program.

This work will be executed to fulfill the requirements outlined in the Operable Unit (OU) 4 Record of Decision (ROD) (Navy, 2018) by completion of the remedial action in accordance with the Final Basis of Design (Tetra Tech, 2019a), the Comprehensive Environmental Response, Compensation and Liability Act, and the National Oil and Hazardous Substances Pollution Contingency Plan.

1.1 Project Summary Scope of Work

The objective of the remedial action is to address polychlorinated biphenyl (PCB)-contaminated soils located at depths varying from ground surface to 30-feet (ft.) below ground surface. This work will consist of utility relocation, excavation, and installation of a reduced permeability cover. The cover will reduce leaching of contaminants from unsaturated soil to groundwater. This work will be performed in compliance with federal, state, and local regulations as they pertain to the environment. The Remedial Action Work Plan (APTIM, 2018b) was developed in accordance with the PWS (NAVFAC, 2018) and the *Specifications for Site 1 – Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage, New York* (Tetra Tech, 2019b).

The objective of the WMP is to document the contractual, legal, and risk-management requirements in the generation, storage, sampling and analysis, waste typing, transportation, treatment, and ultimate disposal of all waste for the task order. Additionally, the WMP is intended to assure that waste generated in the course of the fieldwork is safely managed and disposed of in accordance with all applicable laws and regulations.

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2.0 Site Conditions and Background

This section presents a general description of the site, the history, topography and site features, climate, geology, hydrogeology, hydrology, and contaminants of concern (COCs).

2.1 Site Location

The former NWIRP Bethpage is located in east-central Nassau County, Long Island, New York, approximately 30-miles east of New York City. NWIRP Bethpage is bordered on the north, west, and south by property owned, or formerly owned, by Northrop Grumman that covered approximately 500-acres, and, on the east, by a residential neighborhood.

Site 1 is situated along the eastern boundary of the former NWIRP Bethpage and is a relatively flat area with a four-foot vegetated windrow located along the eastern end of the site and is mounded on the north by a partially buried abandoned sanitary settling tank.

The site is enclosed by a facility perimeter fence along the north, east, and south and an interior facility fence along the west. The interior fence was installed in 1998 as an interim measure to restrict facility personnel from areas with residual soil contamination. The area bounded by this fence is lightly vegetated and includes Area of Concern (AOC) 23 Former Above Ground Storage Tanks; AOC 30 Unidentified Storage Sheds; and AOC 35 Former Sludge Drying Bed. The AOC 35 drying beds were closed and backfilled in 1980. The remainder of Site 1 is covered with concrete or gravel. Dry Wells 20-08 and 34-07 are located outside of the fenced area, but are underneath the interim soil cover that was placed over PCB contaminated soil in 1993.

The land surrounding the 9-acre Bethpage facility in all directions is primarily industrial and residential. Operations at the Site 1 are currently limited to environmental investigations, control of vegetation and fence repair. Security is provided by Steel Equities.

2.2 Site Description and History

The former NWIRP Bethpage was located adjacent to the Grumman facility, and was operated by Grumman and later Northrop Grumman from 1942 to the mid-1990s. The plant's primary mission was the research prototyping, testing, design engineering, fabrication, and primary assembly of military aircraft. In 1996, operations ended at the facility. At that time, the NWIRP was approximately 109.5-acres in size. In 2002, 4.5-acres of the property were transferred to Nassau County. In February 2008, the Navy transferred an additional 96-acres of the remaining 105-acre main parcel to Nassau County. The remaining 9-acre parcel is being retained by the Navy for environmental investigation and remediation.

From the early 1950's to 1978, drums containing liquid wastes were stored on a cinder covered area over a cesspool leach field. This leach field may have been used to discharge process wastewater. In 1978, the drum storage area was moved a few yards to the south to a 100- by 100-foot concrete pad. In 1982, the drum storage area was moved to its present location at Site 3. Transformers and PCB-filled autoclaves were also stored at the site. The waste drums reportedly contained chlorinated and non-chlorinated solvents, and liquid cadmium and chromium wastes. In addition, underlying most of Site 1 are approximately 120 abandoned cesspools that were designed to discharge sanitary wastewaters from Plant No. 3 that were in use from the early 1950s to 1978. These cesspools were approximately 10-inches in diameter and 16-ft. deep. Based on field observations, the cesspools are currently filled with soil between 1978 and 1986. It is possible that non-sanitary wastes may have been discharged into this system. The drum marshalling areas and the leach field were the initial extent of Site 1.

The site was originally identified and investigated as part of the facility-wide investigations. A ROD for Site 1 soil was signed in 1995 to address PCB- and volatile organic compound (VOC) - contaminated soil (NYSDEC, 1995). Residual soil contamination noted in the ROD consists of metals, VOC, polynuclear aromatic hydrocarbon (PAH), and PCBs at concentrations greater than protective levels listed in Technical and Administrative Guidance Memorandum (TAGM) 4046. Levels of these constituents also exceed the New York State Department of Environmental Conservation (NYSDEC) Part 375 Soil Cleanup Objectives, an Applicable or Relevant Appropriate Requirements promulgated in 2006. Groundwater contamination above the TAGM 4046 and Part 375 NYSDEC Cleanup Objectives consisting of metals, VOCs and PAHs was also noted in the ROD.

In June/July 2009, buildings, tanks, and concrete aprons within the fenced portion of Site 1 were demolished and disposed/recycled offsite.

In 2012, at the request of the property leases to allow additional parking for facility tenants and with concurrence from NYSDEC, the southern section of the Site 1 interior facility fence was moved to the north approximately 100-ft. and the western section of the fence was moved to the east approximately 30-ft. This new access area was covered with gravel and asphalt in accordance with the OU 1 ROD. In April 2012, the current property owner, Steel Equities, uncovered two intact Underground Storage Tanks (USTs) that were found to contain residual solvent material. The USTs and contents were removed in September 2012 and post-removal soil samples were collected. As of 2013, the area within the interior facility fence is lightly vegetated soil.

2.3 Contaminants of Concern

COCs identified in the 2018 OU 4 ROD (Navy, 2018). The ROD specifically addresses the following:

- PCBs, VOCs, semi-volatile organic compounds (SVOCs), metals (arsenic, chromium, and hexavalent chromium), and pesticides in soils from ground surface to 65-ft. below ground surface (bgs);
- Residual PCB-contaminated soil associated with Dry Wells 20-08 and 34-07, which were added to Site 1 because of proximity and similarity in COC, concentrations, and depth;
- PCB- and metal (total chromium and hexavalent chromium)-contaminated on-NWIRP groundwater associated with Site 1, which was not addressed in the 1995 OU 1 ROD or the 2003 OU 2 ROD;
- VOCs in Site 1 soil vapor that could result in vapor intrusion. The 1995 ROD did not address soil vapor intrusion as a pathway.

These contaminated media represent potential threats to human health through ingestion, dermal contact, and dust inhalation of contaminated soils; inhalation of soil vapor; and inhalation of volatiles and ingestion of groundwater.

However, based on previous investigations detailed in the 2018 ROD, there are no cleanup goals for this remedial action. This selected remedy will address contaminated soils only and focuses on PCBs because these compounds are present throughout much of Site 1, representing the majority of COC mass, are persistent in the environment, and are detected in groundwater. The COCs will be fully addressed upon the completion of excavation and installation of the geosynthetic clay liner.

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3.0 Anticipated Waste Streams

Several potential waste streams are anticipated to be generated during site activities. Wastes are anticipated to include, but are not limited to, the following:

- SVOC-, PCB-, pesticide-, inorganic constituent- impacted soil and sediment, including organic matter and debris;
- Water/rinsate collected from decontamination procedures;
- Investigation Derived Waste (IDW);
- Secondary refuse (office trash, personal protective equipment [PPE], etc.).

Excavated waste will be managed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 area of contamination policy as described in the 1996 policy memorandum (U.S. Environmental Protection Agency [USEPA], 1996). Waste disposal procedures implemented for the remedial action will be in accordance with the state and federal laws and regulations that govern offsite disposal, as well as NAVFAC and NWIRP Bethpage contract requirements.

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4.0 Waste Management Requirements

Contaminated soil and debris will be contained in stockpiles. In the event that hazardous waste is generated, it will be segregated from non-hazardous wastes. Additionally, incompatible wastes (e.g., flammable and corrosive wastes) will be segregated. Wastes of the same matrix, contamination, and the same source may be aggregated to facilitate storage and disposal. Wastes will be accumulated within the material storage area. Waste accumulation areas will contain appropriate emergency response equipment. The Accident Prevention Plan identifies the specific emergency response procedures and equipment (APTIM, 2018a). Hazardous waste accumulation areas will include fire extinguishers (in areas where wastes are known or suspected to be flammable or ignitable), decontamination equipment, and an alarm system (if radio equipment is not available to all staff working in accumulation area). Spill control equipment (e.g., sorbent pads) will be available in the waste accumulation areas, and where liquids are transferred from one vessel to another.

4.1 Regulatory Requirements

All wastes generated from the remediation action will be managed in accordance with all applicable federal, state, and local regulations. Wastes generated during project activities will be managed in accordance with New York Hazardous Waste Regulations, USEPA Resource Conservation and Recovery Act (RCRA) regulations (40 Code of Federal Regulations [CFR] 261-268), and PCB regulations (40 CFR 761).

4.2 Waste Characterization

Wastes will be characterized prior to transportation and disposal off-site. Prior to off-site disposal, composite samples will be collected for solid waste materials for waste characterization. The samples will be analyzed by an approved, certified analytical laboratory for the following parameters:

- PCBs
- Ignitability, corrosivity, reactivity
- Toxicity Characteristics Leaching Procedure Metals
- Target Compound List (TCL) VOCs
- TCL SVOCs
- Pesticides
- Herbicides

Additional analytes will be added if site conditions indicate their necessity or as directed by the contracting officer. Samples will be collected and analyzed in accordance with the Sampling and Analysis Plan (APTIM, 2018c).

4.3 Waste Management

On-site wastes will be managed in accordance with all federal, state, and local regulations as it pertains to each waste type.

PCB-impacted soils and IDW will be identified in the field. These waste types will be segregated and will be managed as described in section 4.3.4. Equipment that has encountered PCB-impacted soils and IDW will first be dry-decontaminated in the field prior to exiting the site using brushes, and then will be decontaminated as described in section 4.3.1.

4.3.1 Rinsate Decontamination

All vehicles and equipment utilized in the Exclusion Zone will be decontaminated in the equipment decontamination area prior to leaving the site. Site materials such as dirt and mud from vehicles will be removed via power washer prior to accessing a public roadway as discussed in the following sections.

4.3.1.1 Decontamination Materials

Adequate supplies and materials will be available on-site for decontamination activities. Decontamination materials will include the following:

- Portable steam cleaner/power washer and related equipment, if necessary
- Potable water; must be from a municipal water supplier, otherwise an analysis must be run for appropriate volatile and semi-volatile organic compounds and inorganic chemicals (e.g., TCL chemicals)
- Phosphate-free detergent, such a Liquinox
- Buckets
- Brushes
- Squirt bottles, plastic bags, and sheets
- Distilled/de-ionized organic-free water
- American Society for Testing and Materials – Type II grade water
- Methanol (or similar material)

- U.S. Department of Transportation (USDOT) – approved portable storage tank for disposal of waste

The wastes from decontamination procedures will be managed as IDW.

4.3.1.2 Decontamination Procedures

The standard procedures for full vehicle and equipment decontamination are provided below.

- Remove any solid particles from the equipment or material by brushing and then rinsing with available water. This initial step is performed to remove gross contamination.
- Wash equipment sampler with the soap or detergent solution.
- Rinse with tap water.
- Rinse with de-ionized water.
- Rinse with methanol (or similar material).
- Repeat entire procedure or any parts of the procedure if necessary.
- Allow the equipment or materials to air dry before reusing.
- Dispose of any soiled materials in the designated disposal container.

Decontamination procedures will be performed in accordance with APTIM's Hazardous Waste Decontamination Work Instruction (Attachment A).

4.3.2 Secondary Refuse

Solid and sanitary waste will be generated in the material storage area and within the site boundary from used PPE, miscellaneous office wastes, used paper towels, and segregated wastes. Wasted will be managed in a manner to prevent its release. Spilled materials, contaminated soil and water, absorbents, and miscellaneous spill-related debris require proper handling. APTIM will properly dispose of these and any other materials associated with spill containment and cleanup.

4.3.3 Storage and Labeling

Wastes will be removed from the site as soon as possible, but will not be accumulated for more than 90-days from the date of generation (i.e., the date that a waste was first placed in container – i.e., drum, roll-off box, tank, or a stockpile outside of the area of contamination). Waste containers will be labeled in accordance with 49 CFR 172, 173, and 178. Labels will include the type of waste, location from which the waste was generated, and accumulation start date. One of the following labels will be used on containers/drums, roll-off boxes, and tanks, as appropriate:

- "Analysis Pending" or "Waste Material" – Temporary or handwritten label until analytical results are received and reviewed. This label will include the accumulation start date.
- "Non-Hazardous Waste" – pre-printed labels with the following information:
    - Accumulation start date
    - Generator name
    - USEPA ID number
    - Waste-specific information (e.g., soil)
- "Hazardous Waste" – pre-printed labels with the following information:
    - Accumulation start date
    - Generator name
    - USEPA ID number
    - Waste codes

Containers used for waste storage will be kept closed and locked at the end of each work day to prevent waste migration or spills.

4.3.4 Inspection of Waste Storage Areas

Waste accumulation areas will be inspected at least weekly for malfunctions, deterioration, discharges, and leaks that could result in a release.

- Containers will be inspected for leaks, signs of corrosion, or signs of general deterioration.
- Stockpiles will be inspected for liner and berm integrity.

Any deficiencies observed or noted during inspection will be corrected immediately. Appropriate measures may include transfer of waste from the leaking container to a new container, replacement of liner or cover, or repair of containment berm.

Inspections will be recorded in the Daily Quality Control Report and include any deficiencies and how issue was rectified. Copies of the report will be maintained onsite, and available for review.

If operations are suspended for more than seven days, the regulatory compliance manager will be contacted and alternate inspection arrangements will be made. Prior to demobilization, all wastes will be removed from the site.

4.3.5 Transportation and Disposal

APTIM and its subcontractors will coordinate the transportation and disposal of the contaminated materials. Waste profiles, manifests, and bills of lading will be generated and provided for the soil waste classifications and accepting facilities, as applicable. The proposed facilities for transportation and disposal of RCRA-Hazardous, Toxic Substances Control Act (TSCA)-Hazardous, and non-hazardous soils are provided below. Applicable permits and documentations for the facilities are provided in Attachment B.

Non-Hazardous Soil

WM Fairless Landfill
1000 New Ford Mill Road
Morrisville, PA 19067
Phone: (800) 963-4776
PADEP Permit #: 101699

Hazelton Creek Properties
282 South Church Street
Hazelton Creek, PA 18201
Phone: (570) 501-5050

Municipal Solid Waste Landfill
420 Quarry Road,
Morgantown, PA 19543
Phone: (717) 246-4640
EPAID#: PA0000015867

Brookhaven Landfill Gas Recovery Facility
350 Horseblock Road,
Yaphank, NY 11980
Phone: (631) 704-6099
Permit ID#: 1-4722-00799/00013

Gloucester County Solid Waste Complex
109 Budd Boulevard
Woodbury, NJ 08096
Phone: (856) 379-7391
EPAID#: LOP100003

RCRA Hazardous Soil

US Ecology Idaho
20400 Lemley Road,
Grand View, ID 83624
Phone: (800) 274-1516
EPAID#: IDD073114654

Envirosafe Services of Ohio
876 Otter Creek Roadd
Oregon, OH 43616
Phone: (215) 659-2001
EPAID#: OHD045243706

TSCA Hazardous Soil (PCB > 50 parts per million [ppm])

Heritage Subtitle C Landfill
4370 West Country Road 1275 North
Roachdale, IN 46172
EPAID#: IND980503890

US Ecology Michigan Landfill
49350 North I-94 Service Drive,
Belleville, MI 48111
Phone: (800) 592-5489
EPAID#: MIS048090633

Alabama Department of Environmental Management
PO Box 55
Emelle, AL 35459
Phone: (404) 402-5732
EPAID#: ALD000622464

TSCA Hazardous Soil (PCB > 1,000 ppm)

CWM Waste Management Emelle
36964 AL Hwy 17, PO Box 55
Emelle, AL 35459
Phone: (205) 652-9721
EPAID#: ALD000622464

During transportation and disposal activities, haul trucks will be lined to ensure the truck beds do not become contaminated. Haul trucks will be loaded with excavated material using an excavator with bucket attachment from the material storage areas. Following loading, all trucks will be inspected, decontaminated, and weighed at the truck scale prior to leaving the site. A dedicated laborer will be assigned to manage the documentation of all exported materials and ensure trucks leaving the site are free of debris. Transportation and disposal activities will be coordinated and executed in accordance with Section 02 81 02 of the Project Specifications (Tetra Tech, 2019b), USDOT, USEPA, and New York State regulations, as applicable.

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5.0 References

APTIM, 2018a. *Accident Prevention Plan for Site 1 – Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New Yor*k, (draft) September.

APTIM, 2018b. *Remedial Action Work Plan for Site 1 - Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New Yor*k, (draft) September.

APTIM, 2018c. *Sampling and Analysis Plan for Site 1 – Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New Yor*k, (draft) September.

NAVFAC, 2018. *Performance Work Statement Site 1 – Former Drum Marshalling Area Remedial Action for Contaminated Soil,* June 13.

Navy, 2018. *Record of Decision Operable Unit 4 Naval Weapons Industrial Reserve Plant, Bethpage, New York.*

NYSDEC, 1995. *Record of Decision Operable Unit 1 NWIRP Bethpage, NY*. March

Tetra Tech, Inc. 2019a. *Final Basis of Design for Site 1 – Former Drum Marshalling Area, Naval Weapons Industrial Reserve Plant, Bethpage, New York.*

Tetra Tech, 2019b. *Specifications for Site 1 – Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant Bethpage, New York,* May 25.

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Appendix A
AMS-710-04-WI-00305 Hazardous Waste Decontamination

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WORK INSTRUCTION

Procedure Title:	**Hazardous Waste Decontamination**	**AMS Number:**	**AMS-710-04-WI-00305**
Procedure Owner:	**HSE**	**Issuing Authority:**	**APTIM Quality Management**

HAZARDOUS WASTE DECONTAMINATION

INT	Issued for Interim Use	M. Hadacek & S. Lachney	7/30/2017
Rev	**Changes**	**Approved**	**Date**

1.0 PURPOSE

This work instruction provides the guidelines for effective decontamination of personnel and equipment. This work instruction does not cover decontamination of radioactively contaminated personnel or equipment. A health physicist should be consulted if radioactive material is suspected to be present on site.

2.0 APPLICATION

This work instruction applies to all APTIM employees, contractors, subcontractors and visitors associated with a APTIM site.

3.0 REQUIREMENTS

The following personnel have responsibilities defined in this procedure:

- APTIM Managers
- APTIM Supervisors
- APTIM Employees
- APTIM Contractors
- APTIM Subcontractors
- APTIM Visitors

4.0 REFERENCES

AMS-710-04-PR-00300	Hazardous Waste Operations
AMS-710-04-PR-04113	Waste Characterization
OSHA	Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, NIOSH, OSHA, USCG, EPA, October 1985
FSOP	Field Standard Operating Procedures (FSOP)*7, Decontamination of Response Personnel, USEPA, January 1985
OSHA	Title 29, Code of Federal Regulations, Parts 1910 and 1926, Occupational Safety and Health Administration (OSHA), U.S. Department of Labor

5.0 WORK INSTRUCTION

Decontamination protects workers from hazardous substances that may contaminate and eventually permeate protective clothing, respiratory equipment, tools, vehicles, and other equipment used onsite. Decontamination also protects all site personnel by minimizing the transfer of harmful materials into clean areas. It helps prevent mixing of incompatible chemicals and protects the community by preventing uncontrolled transportation of contaminants from the site.

5.1 Potential Hazards

5.1.1 While decontamination is performed to protect health and safety, it may pose the following hazards:

5.1.1.1 Be incompatible with the hazardous substances being removed (i.e., decontamination method may react with contaminants to produce an explosion, heat, or toxic products).

5.1.1.2 Be incompatible with the clothing or equipment being decontaminated (e.g., some organic solvents can permeate and/or degrade protective clothing).

5.1.1.3 Be a direct health hazard to workers (e.g., vapors from chemical decontamination solutions may be hazardous if inhaled, or they may be flammable).

5.1.1.4 The chemical and physical compatibility of the decontamination solutions or other decontamination materials must be determined before they are used. Any decontamination method that permeates, degrades, damages, or otherwise impairs the safe functioning of the Personal Protective Equipment (PPE) is incompatible with such PPE and should not be used.

5.1.1.5 If a decontamination method poses a direct health hazard, measures must be taken to protect both decontamination personnel and workers being decontaminated. Exhibit 7.1 presents a decision aid for evaluating the health and safety aspects of decontamination methods.

5.2 Prevention of Contamination

5.2.1 Prevention includes the following methods:

5.2.1.1 Follow procedures for proper dressing prior to entry into the Exclusion Zone (AMS-710-04-PR-00300 Hazardous Waste Operations). Proper dressing will minimize the potential for contaminants to bypass the PPE and escape decontamination.

5.2.1.2 Protect monitoring and sampling instruments by bagging. Make openings in the bags for sample ports and sensors that must contact site materials. Cover equipment and tools with a strippable coating which can be removed during decontamination.

5.2.1.3 Encase the source of contaminants (e.g., plastic sheeting or overpacks). Stress work practices that minimize contact with hazardous substances. Use remote sampling, handling, and container-opening techniques.

5.3 Decontamination Equipment Selection

In selecting decontamination equipment, consider whether the equipment itself can be decontaminated for reuse or be easily disposed of. Exhibit 7. 2 lists recommended equipment for decontamination of personnel, PPE, and equipment. Exhibit 7.3 lists recommended equipment for decontamination of heavy equipment and vehicles.

5.4 Decontamination Facility Design

5.4.1 Decontamination facilities should be located in the Contamination Reduction Zone (CRZ), i.e., the area between the Exclusion Zone (the contaminated area) and the Support Zone (the clean area) as described in the Site Safety and Health Plan (SSHP).

5.4.2 Site-specific factors that affect the decontamination facility design must be considered. Typical factors to consider follow:

- The chemical, physical, and toxicological properties of the wastes
- The pathogenicity of infectious wastes
- The amount, location, and containment of contaminants
- Climatic conditions, particularly predominate wind directions
- Storm water run-on and runoff conditions adjacent to work zones
- The potential for, and location of, exposure based on assigned worker duties, activities, and functions
- The potential for wastes to permeate, degrade, or penetrate materials used for personal protective clothing and equipment, vehicles, tools, buildings, and structures
- The proximity of incompatible wastes
- The movement of personnel and/or equipment among different zones
- The emergencies that may arise

- The methods available for protecting workers during decontamination
- The impact of the decontamination process and compounds on worker health and safety

5.4.3 Decontamination shall be an organized process by which levels of contamination are successively reduced to acceptable levels.

5.4.4 The decontamination process shall consist of a series of steps performed in a specific sequence. For example, outer, more heavily contaminated items shall be decontaminated first, followed by decontamination and removal of inner, less contaminated items.

5.4.5 Each step shall be performed at a separate station to prevent cross contamination. The sequence of stations is called the decontamination line.

5.4.6 Decontamination stations shall be separated physically to prevent cross contamination and shall be arranged in order of decreasing contamination, preferably in a straight line.

5.4.7 Separate flow patterns and stations shall be provided to isolate workers from different contamination zones containing incompatible wastes.

5.4.8 Entry and exit points shall be conspicuously marked, as well as the entry to the Contamination Reduction Zone (CRZ).

5.4.9 CRZ from the Exclusion Zone should be separate from the entry to the Exclusion Zone from the CRZ.

5.4.10 Dressing stations for entry to the CRZ shall be separate from redressing areas for exit from the CRZ.

5.4.11 Personnel who wish to enter clean areas of the decontamination facility, such as locker rooms, shall be completely decontaminated.

5.4.12 Examples of decontamination lines and procedures for personnel wearing various levels of protection are provided in the Exhibits of this procedure.

5.5 Personal Protective Equipment for Decontamination Workers

5.5.1 The minimum level of PPE worn by decontamination workers shall be one level of protection lower than that required in the Exclusion Zone.

5.5.2 Site-specific cases may require that decontamination personnel wear the same levels of PPE as workers in the Exclusion Zone. Examples of these cases include:

- Workers using a steam jet may need a different type of respiratory protection than other decontamination personnel because of the high moisture content of the steam jets.
- Cleaning solutions used and wastes removed during decontamination may generate harmful vapors, requiring a different type of respiratory or clothing protection.

5.5.3 All decontamination workers shall be decontaminated before entering the clean Support Zone.

5.6 Decontamination Methods

5.6.1 All personnel, clothing, equipment, and samples leaving the contaminated area of a site shall be decontaminated to remove any harmful chemicals or infectious organisms that may have adhered to them.

5.6.2 The decontamination methods available are as follows:

- Physical removal
- Chemical detoxification or disinfection/sterilization
- A combination of both physical and chemical methods

5.6.3 The selected decontamination method shall be effective for the specific substance present. Exhibit 7.1 provides a decision aid for evaluating the health and safety aspects of decontamination methods.

5.6.4 The selected decontamination method shall be reviewed for any safety and health hazards. If the selected method poses a direct health hazard, measures shall be taken to protect both the decontamination personnel and the workers to be decontaminated. If the selected method includes the use of an aqueous solution rinse, all runoff shall be controlled, collected, and contained for proper disposal.

5.6.5 Physical methods using high pressure and/or heat shall be used only as necessary and with caution.

5.6.5.1 Loose contaminants shall be removed by using a water or liquid rinse to remove dust and vapors that cling to equipment and workers or that are trapped in small openings, such as clothing or fabric weaving.

5.6.5.2 Adhering contaminants shall be removed by the following methods:

1. Scraping, brushing and wiping
2. Solidifying
3. Freezing (using dry ice or ice water)
4. Adsorption or absorption (e.g., kitty litter or powdered lime)
5. Melting

5.6.5.3 Volatile liquid contaminants shall be removed from PPE or equipment by evaporation followed by a water rinse. Evaporation may be expedited by the use of steam jets.

5.6.6 Decontamination using chemicals shall be done only if recommended by an industrial hygienist or other qualified health professional.

5.6.7 Any chemical used in the decontamination process shall be chemically compatible with the equipment or clothing being decontaminated. For example, some personal protective clothing is constructed of organic materials and could be damaged by an organic solvent. Exhibit 7.4 lists a guide to solubility of contaminants in four solvent types.

5.6.8 Chemical removal types include the following:

5.6.8.1 Surface contaminants can be dissolved in a solvent.

5.6.8.2 Surfactants can be used to aid physical cleaning by reducing adhesion forces between the contaminants and the surface being cleaned and by preventing redeposit of the contaminants (e.g., detergents).

5.6.8.3 Solidification of liquid or gel contaminants can enhance their physical removal. Typical solidification processes are moisture removal using adsorbents such as grounded clay or powdered lime and chemical reactions using polymerization chemicals and/or chemical reagents.

5.6.8.4 Rinsing with water and/or chemicals removes contaminants through dilution, physical attraction, and solubility. Multiple rinses enhance the removal of contaminants.

5.6.8.5 Disinfection/Sterilization is not generally used because the standard available techniques are not practical for PPE and small and large equipment. Disposable PPE is recommended for use with infectious agents.

5.7 Personnel Decontamination

5.7.1 Four levels of personnel protection as described in 29 CFR 1910.120 Appendix B are available for use at any given site.

5.7.2 The following is a description of the decontamination process for each level.

5.7.2.1 Level D

- An area shall be designated for the removal of gloves and boot covers. Paper towels shall be available for removal of this equipment.
- A trash barrel at the site shall be provided for all disposable non-contaminated PPE. This material shall be disposed of in a normal trash receptacle at the plant before leaving the site.
- Laundering of personal clothing shall be completed as soon as possible once offsite.
- Soap and water shall be used to wash hands before eating, drinking, or smoking and before using the bathroom facilities.

5.7.2.2 Level C

- A decontamination line shall be assembled.
- The maximum decontamination layout shall contain an 18-step process as shown in Exhibit 7.11. The flowchart for this layout is listed in Exhibit 7.7.
- At the discretion of the Safety Representative, the decontamination line shall be modified to a minimum layout as shown in Exhibit 7.12 after site-specific conditions have been evaluated. The procedure for this layout is listed in Exhibit 7.8.
- The decontamination line shall be located up-gradient and upwind of the Exclusion Zone and shall be located within a shaded area during hot weather.

5.7.2.3 Level B

- A decontamination line shall be assembled. For decontamination of Level B PPE, the personnel decontamination area shall be typically set up with decontamination tubs filled with decontamination fluids and rinses, boot racks, and equipment storage and disposal facilities located on a wooden platform set on clean gravel and provided with a tarp.
- The maximum decontamination layout shall contain a 19-step process as shown in Exhibit 7.9. The procedure for this layout is listed in Exhibit 7.10.
- At the discretion of the Safety Representative, the decontamination line may be modified to a minimum layout as shown in Exhibit 7.7 after site-specific conditions have been evaluated. The procedure for this layout is listed in Exhibit 7.8.
- Shower facilities (with hot and cold water) or, at a minimum, personal wash sinks shall be provided for all Level B personnel at the site.
- Showers or personal wash sinks shall be located in a trailer or other suitable structure equipped with adequate ventilation, and lighting systems. It shall also contain benches, tables, lockers, and racks for clothing.
- Personnel shall use the shower facilities or wash sinks prior to changing into street clothes.
- Soap, shampoo, towels, and washcloths shall be provided.
- Contaminated clothing shall be left in a designated area until characterized and properly disposed.
- Wastewater from the wash facility shall be piped to a holding tank for sampling for hazardous characteristics prior to discharge.

5.7.2.4 Level A

- A decontamination line shall be assembled. For decontamination of Level A PPE, the personnel decontamination area shall be typically set up with decontamination tubs filled with decontamination fluids and rinses, boot racks, and equipment storage and disposal facilities located on a wooden platform set on clean gravel and provided with a tarp.
- The maximum decontamination layout shall contain a 19-step process as shown on Exhibit 7.10. The procedure for this layout is listed in Exhibit 7.11.
- At the discretion of the Site EHS Manager/Supervisor/Representative, the decontamination line shall be modified to a minimum layout as shown in Exhibit 7.7 after site-specific conditions have been evaluated. The procedure for this layout is listed in Exhibit 7.8.
- Shower facilities (with hot and cold water) or, at a minimum, personal wash sinks shall be provided for all Level A personnel at the site.
- Showers or personal wash sinks shall be located in a trailer or other suitable structure equipped with adequate ventilation and lighting systems. The structure shall also contain benches, tables, lockers, and racks for clothing.
- Personnel shall use the shower facilities or wash sinks prior to changing into street clothes.
- Soap, shampoo, towels, and washcloths shall be provided.
- Contaminated clothing shall be left in a designated area until characterized and properly disposed.
- Wastewater from the wash facility shall be piped to a holding tank for sampling and analyses prior to discharge.

5.8 Equipment Decontamination

5.8.1 The extent of known contamination shall determine to what extent equipment needs to be decontaminated. If the extent of contamination cannot be determined, cleansing should be done with the assumption that the equipment is highly contaminated until enough data are available to allow assessment of the actual level of contamination.

5.8.2 Adequate supplies of all materials shall be kept on hand. This includes all rinsing liquids and other required materials.

5.8.3 The standard procedures shall be considered for full field decontamination. If different or more elaborate procedures are required for a specific project, they shall be identified in the SSHP. Such variations in decontamination may include all, part, or an expanded scope of the following decontamination process.

5.8.3.1 Standard Procedures

1. Remove any solid particles from the equipment or material by brushing and then rinsing with available tap water. This initial step is performed to remove gross contamination.
2. Wash equipment sampler with the soap or detergent solution.
3. Rinse with tap water.
4. Rinse with de-ionized water.
5. Rinse with methanol (or similar material).
6. Repeat entire procedure or any parts of the procedure if necessary.
7. Allow the equipment or material to air dry before reusing.
8. Dispose of any soiled materials in the designated disposal container.

5.8.3.2 Sanitizing Procedures

1. Decontaminate and sanitize respirators, reusable clothing, and other personal articles before reuse.
2. Follow manufacturer's instructions for sanitizing respirator masks.

3. Machine wash reusable protective clothing after a thorough decontamination, if practical. Otherwise, hand wash the clothing.

5.9 Quality Assurance

5.9.1 The effectiveness of any decontamination method used at a site shall be assessed at the beginning of a project and periodically throughout the life of a project. The Site HSE Manager shall monitor project procedures to determine their effectiveness.

5.9.2 If a decontamination method is not considered effective, the decontamination program shall be revised. Visual observation, wipe sampling, cleaning solution analysis, and permeation testing shall be the typical methods to determine the effectiveness of decontamination.

5.9.3 Visual observation shall be used to estimate the effectiveness of decontamination.

5.9.4 Natural light shall be used to detect contaminants that have not been removed. Discoloration, stains, corrosive effects, visible dirt, or alterations in clothing fabric may indicate inadequate decontamination.

5.9.5 Certain contaminants may be visible under ultraviolet light. However, a qualified health professional shall assess the benefits and risks associated with ultraviolet light prior to use at a hazardous waste site.

5.9.6 Wipe testing shall be used as an "after-the-fact" procedure to assess decontamination effectiveness.

5.9.7 A sample pad shall be wiped over the surface of a potentially contaminated area or object and then analyzed in a laboratory.

5.9.8 Inner and outer surfaces of protective clothing shall be tested.

5.9.9 Skin shall be tested using wipe samples.

5.9.10 Analysis of the cleaning solution is used as an "after-the-fact" procedure to determine decontamination effectiveness.

5.9.11 Cleaning solutions are analyzed to determine the quantities of contaminants left in the solutions.

5.9.12 Elevated levels of contaminants in the final rinse solution may indicate that additional decontamination is required.

5.9.13 Permeation testing is used as an "after-the-fact" procedure to assess the effectiveness of decontamination.

5.9.14 Testing for permeated chemical contaminants requires that pieces of the protective garments be analyzed in a laboratory.

5.10 Disposal Methods

5.10.1 All equipment used for decontamination shall be decontaminated and/or disposed of properly. Refer to AMS-710-04-PR-04113 Waste Characterization.

5.10.2 Buckets, brushes, clothing, tools, and other contaminated equipment shall be collected, placed in containers, and labeled.

5.10.3 All spent solutions and wash water shall be collected and disposed of properly. Clothing that is not completely decontaminated shall be placed in plastic bags, pending further decontamination and/or disposal.

5.10.4 Potentially hazardous wastes that are accumulated through decontamination activities shall be staged/stored in a secure and protected area provided onsite.

5.10.5 Containers used to store the hazardous materials shall be of an approved design and shall be prominently labeled with the words "HAZARDOUS WASTE" or with other words

that clearly and accurately identify the contents of the container and the date upon which the period of accumulation of the material began.

5.10.6 The containers holding the hazardous waste shall be cared for and maintained in a fashion that will prevent leaks or any discharge of the material to the ground surface. Should leaks occur, the materials in the container shall be transferred to a container in good condition or be placed in an overpack drum. The containers, in all cases, shall be compatible with the materials to be stored.

5.10.7 All containers holding hazardous waste shall remain closed during storage, except when it is necessary to add or remove waste. All containers holding hazardous waste or intended to contain hazardous waste shall not be opened or stored in any way that may rupture the container or allow it to leak.

5.10.8 Wastes determined to be incompatible shall be separated or protected from each other.

5.10.9 Decontamination-generated contaminated material, once collected and properly stored, shall be subjected to analytical testing to determine the requirements for transportation and ultimate disposal.

5.10.10 The hazardous nature of materials shall be determined by the local jurisdiction's regulations.

5.10.11 Unauthorized employees shall not remove protective clothing or equipment from change rooms.

5.10.12 Commercial laundries or cleaning establishments that decontaminate protective clothing or equipment shall be informed of the potentially harmful effects of exposure to hazardous substances.

5.11 Emergency Decontamination

5.11.1 In an emergency, the primary concern is to prevent the loss of life or severe injury to site personnel.

5.11.2 In the emergency case where immediate medical treatment is required, decontamination shall be delayed until the victim is stabilized.

5.11.3 Decontamination shall be performed immediately if it will not interfere with essential life saving techniques or first aid.

5.11.4 If an emergency is due to heat-related illness, the victim's protective clothing shall be removed as soon as possible to reduce heat stress.

5.12 Terminology

Term	***Definition***
Decontamination	The removal of hazardous substances from employees and their equipment to the extent necessary to preclude the occurrence of foreseeable adverse health effects.

6.0 EXHIBITS

Exhibit 7.1	Decision Aid for Evaluating Health and Safety Aspects of Decontamination Methods
Exhibit 7.2	Recommended Equipment for Decontamination of Personnel, PPE, and Equipment
Exhibit 7.3	Recommended Equipment for Decontamination of Heavy Equipment and Vehicles
Exhibit 7.4	General Guide to Solubility of Containments in Four Solvent Types

Exhibit 7.5	Maximum Decontamination Layout - Level C Protection (flowchart)
Exhibit 7.6	Maximum Measures for Levels B and C Contamination
Exhibit 7.7	Minimum Decontamination Layout – Levels A, B, and C Protection (flowchart)
Exhibit 7.8	Minimum Measures for Levels A, B, and C Decontamination
Exhibit 7.9	Maximum Decontamination Layout - Level B Protection (flowchart)
Exhibit 7.10	Maximum Decontamination Layout - Level A Protection (flowchart)
Exhibit 7.11	Maximum Measures for Level A Decontamination
Exhibit 7.12	Typical Decontamination Methods
Exhibit 7.13	AMS-720-01-FM-00020 – Business Glossary
Exhibit 7.14	AMS-720-01-FM-00021 – Technical Glossary

EXHIBIT 7.1 **DECISION AID FOR EVALUATING HEALTH AND SAFETY ASPECTS OF DECONTAMINATION METHODS** **PAGE 1 OF 1**

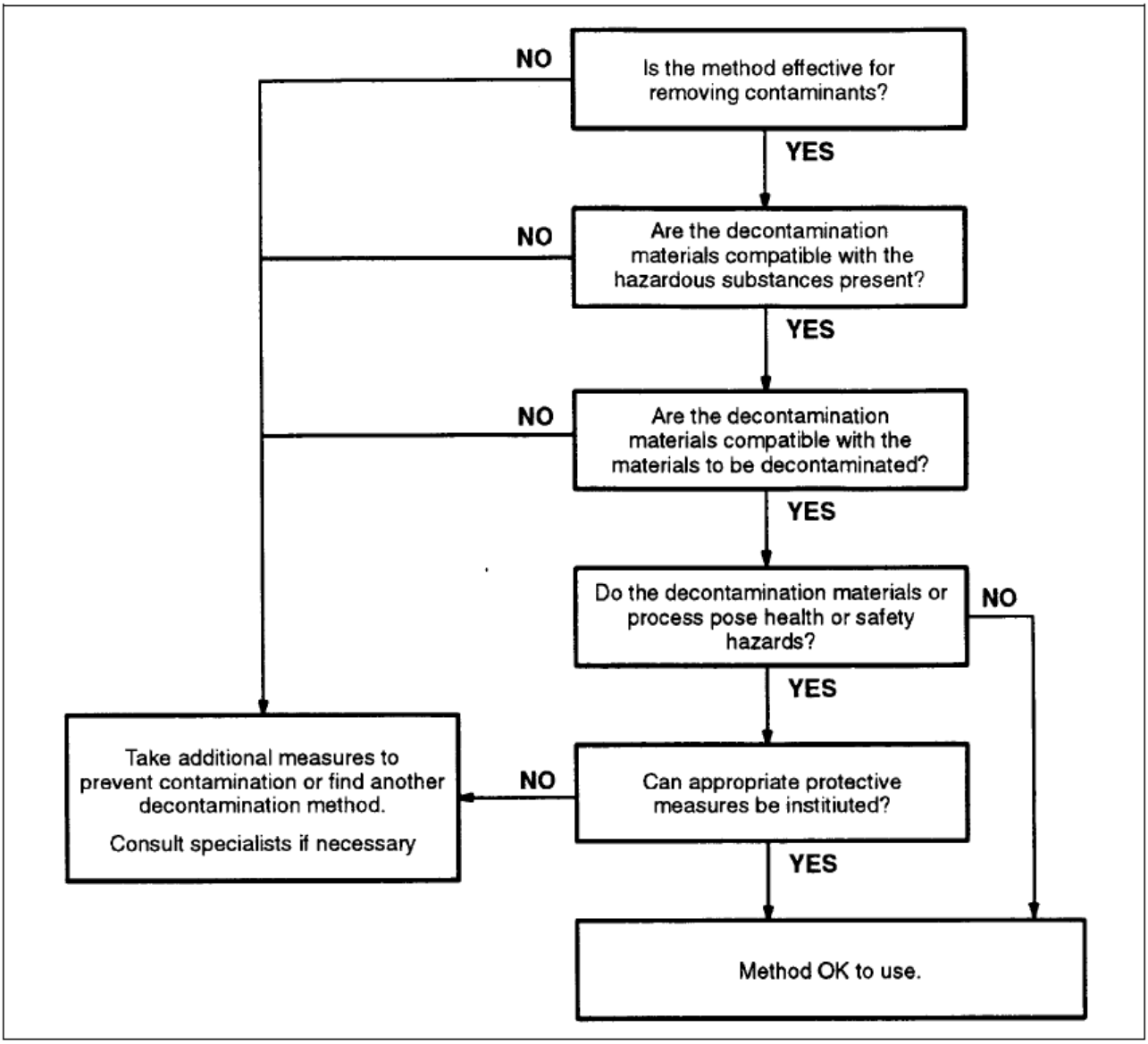


EXHIBIT 7.2 **RECOMMENDED EQUIPMENT FOR DECONTAMINATION OF PERSONNEL, PPE, AND EQUIPMENT**

1. Drop cloths of plastic or other suitable materials
2. Collection containers, such as drums or trash cans
3. Lined box with adsorbents
4. Large galvanized tubs, stock tanks, or children's wading pools
5. Wash solutions appropriate for the contaminants present
6. Rinse solutions appropriate for the contaminants present
7. Long handled, soft bristled brushes
8. Paper and/or cloth towels
9. Lockers and cabinets
10. Metal or plastic cans or drums
11. Plastic sheeting or sealed pads with drains
12. Shower facilities or at a minimum personal wash sinks
13. Soap or wash solution, wash cloths, and towels
14. Tape
15. Traffic cones
16. Warning signs
17. Hoses
18. Rope
19. Ladders
20. Shovels
21. Spare breathing apparatus air cylinders (if used)

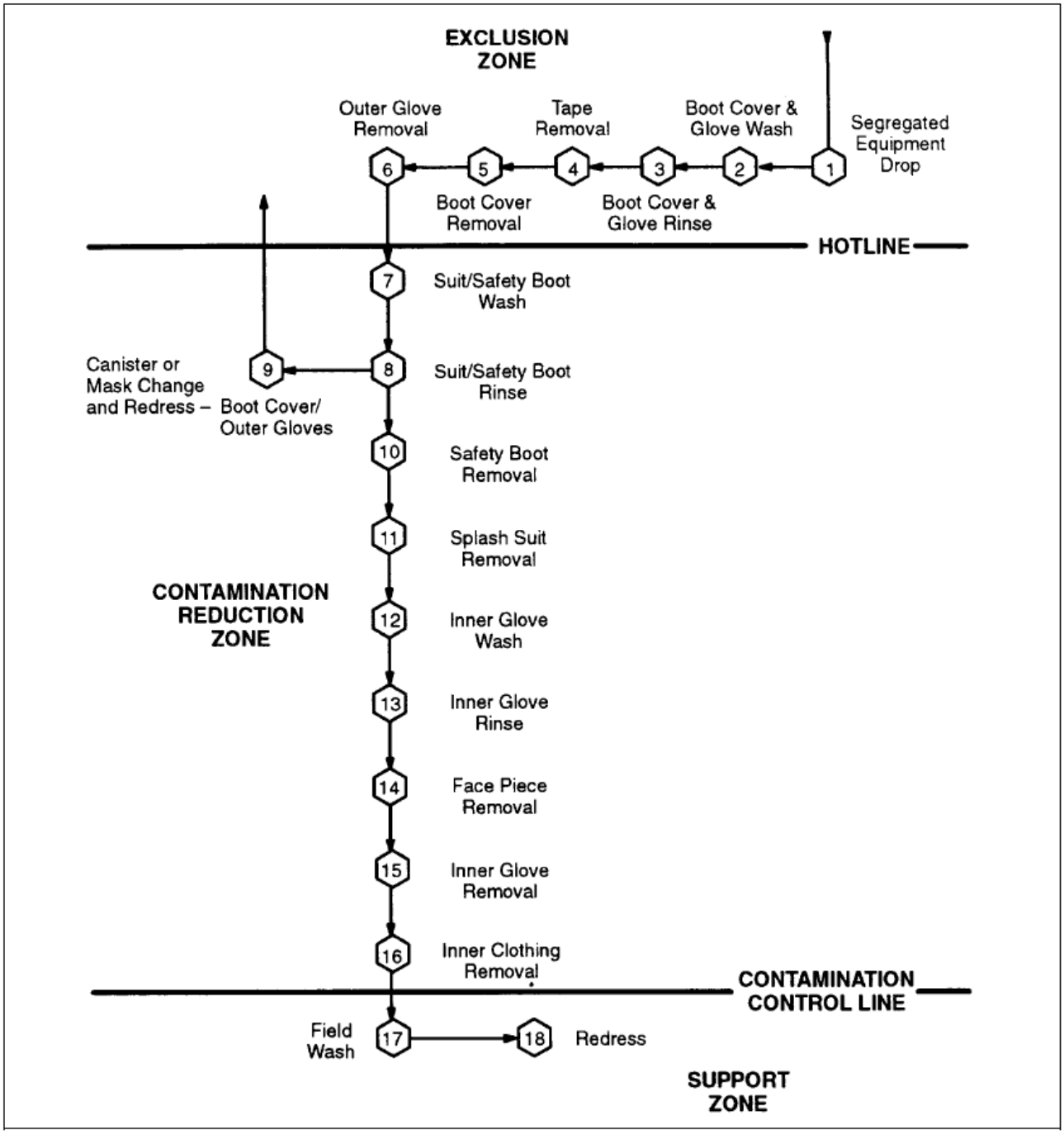
EXHIBIT 7.3 **RECOMMENDED EQUIPMENT FOR DECONTAMINATION OF HEAVY EQUIPMENT AND VEHICLES** **PAGE 1 OF 1**

1. Storage tanks or appropriate treatment systems
2. Drains or pumps
3. Long-handled brushes
4. Wash solutions appropriate for the contaminants present
5. Rinse solutions appropriate for the contaminants present
6. Pressurized sprayers for washing and rinsing
7. Curtains, enclosures, or spray booths
8. Long-handled rods and shovels
9. Containers to hold contaminants and contaminated soils
10. Wash and rinse buckets
11. Brooms
12. Containers for storage and disposal of contaminated material

EXHIBIT 7.4 **GENERAL GUIDE TO SOLUBILITY OF CONTAINMENTS IN FOUR SOLVENT TYPES**

SOLVENT	SOLUBLE CONTAMINANTS
Water	• Low chain hydrocarbons • Inorganic compounds • Salts • Some organic acids and other polar compounds
Dilute Acids	• Basic (caustic) compounds • Amines • Hydrazines
Dilute Bases *For example:* - Detergent, - soap	• Acidic compounds • Phenols • Thiols • Some nitro and sulfonic compounds
Organic Solvents *For example:* - alcohols - ethers - ketones - aromatics - straight chain alkanes - common petroleum product	• Nonpolar compounds (e.g., some organic compounds)

EXHIBIT 7.5 **MAXIMUM DECONTAMINATION LAYOUT - LEVEL C PROTECTION (FLOWCHART)** **PAGE 1 OF 1**



Station 1 - Segregated Equipment Drop	Deposit equipment used on plastic drop cloths or in different containers with plastic liners.
Station 2 - Outer Glove & Boot Cover Wash	Scrub outer boot covers and gloves with decontamination
Station 3 - Boot Cover and Glove Rinse	Rinse off decontamination solution from Station 2 using copious amounts of water.
Station 4 - Tape Removal	Remove tape around boots and gloves, and deposit in containers with plastic liner.
Station 5 - Boot Cover Removal	Remove boot covers and deposit in container with plastic liner.
Station 6 - Outer Glove Removal	Remove outer gloves and deposit in container with plastic liner.
Station 7 - Suit / Safety Boot Wash	Thoroughly wash chemical resistant splash suit with long handled, soft bristle scrub brush, and copious amounts of decontamination solution or detergent/water. Wrap SCBA regulator with plastic to keep out water. Wash backpack assembly with sponges or cloths. (For level C, instructions for SCBA do not apply.)
Station 8 - Suit / SCBA / Glove Rinse	Rinse off decon solution ordetergent water using copious amounts of water. Repeat as many times as necessary.
Station 9 - Tank Change	If a worker leaves the Exclusion Zone to change an air tank, this is the last step in the decontamination procedure. Worker's air tank is exchanged and new outer gloves and boots donned, and joints tapped. Worker returns to duty.
Station 10 - Safety Boot Removal	Remove safety boots and deposit in container lined with plastic.
Station 11 - SCBA Backpack Removal	While still wearing facepiece remove backpack and place on table. Disconnect hose from regulator valve and proceed to next station.
Station 12 - Splash Suit Removal	With assistance, remove splash suit. Deposit in container with plastic liner.
Station 13 - Inner Glove Wash	Wash inner gloves with decon solution or a detergent / water that does not harm skin. Repeat as many times as necessary.
Station 14 - Inner Glove Rinse	Rinse inner gloves with water. Repeat as many times as necessary.
Station 15 - Facepiece Removal	Remove facepiece. Avoid touching face with gloves. Deposit in container with plastic liner.
Station 16 - Inner Glove Removal	Remove inner gloves and deposit in container with plastic liner.
Station 17 - Inner Clothing Removal	Remove clothing soaked with perspiration. Place in container with plastic liner. Do not wear inner clothing off site since there is a possibility that small amounts of contaminants might have been transferred in removing chemical suits.
Station 18 - Field Wash	Wash hands and face thoroughly.
Station 19 - Re-dress	Put on clean clothes.

EXHIBIT 7.7 MINIMUM DECONTAMINATION LAYOUT – LEVELS A, B, AND C PROTECTION(FLOWCHART) **PAGE 1 OF 1**

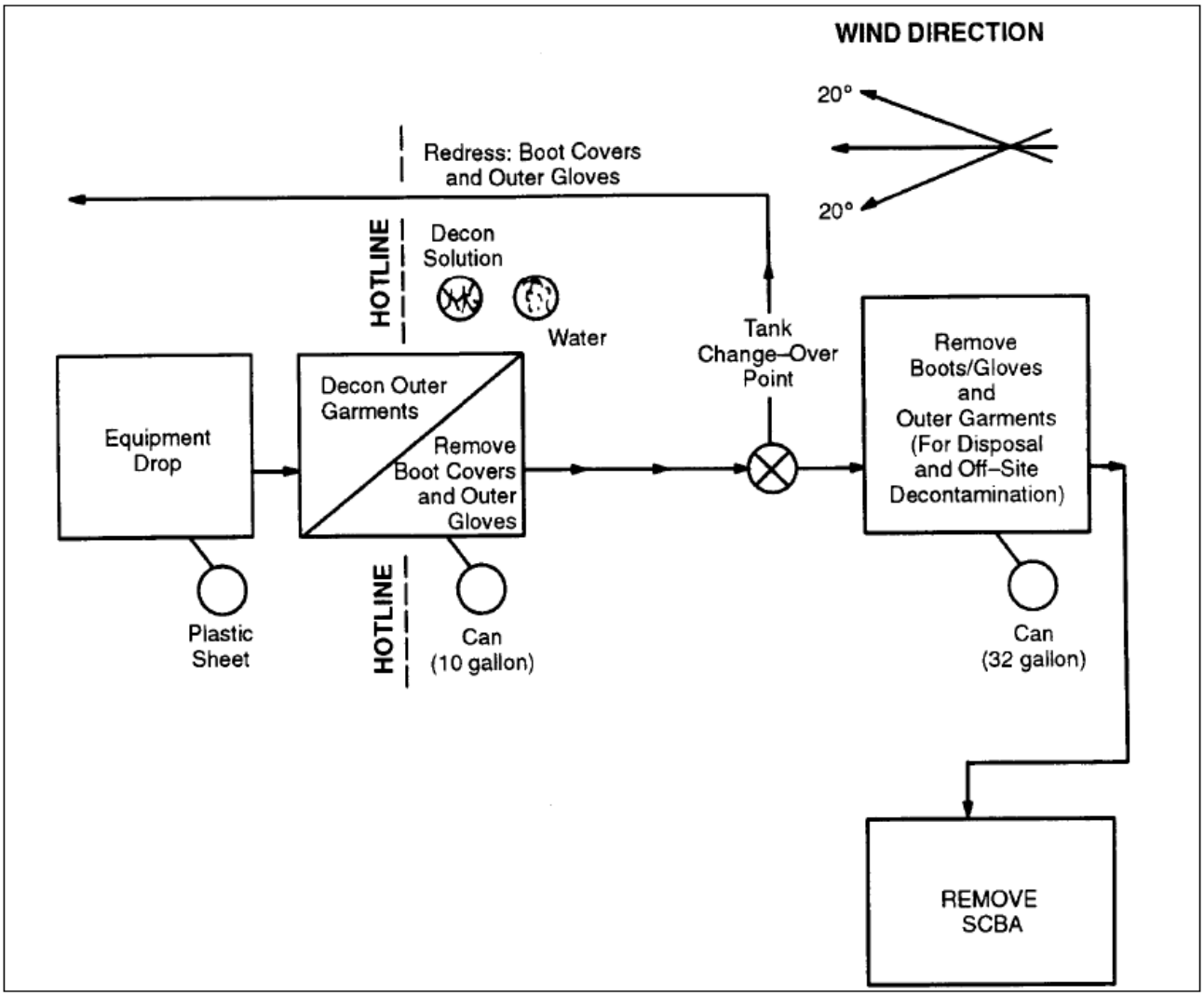


EXHIBIT 7.8 MINIMUM MEASURES FOR LEVELS A, B, AND C DECONTAMINATION PAGE 1 OF 1

Station 1 Equipment Drop	Deposit equipment used on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather, a cool down station may be setup in this area.
Station 2 Outer Garment, Boots, & Gloves - Wash & Rinse	Scrub outer boots, outer gloves, and suit with decontamination solution or detergent / water. Rinse off using copious amounts of water.
Station 3 Outer Boot & Glove Removal	Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4 Tank / Air Canister Change	If a worker leaves the Exclusion Zone to change an air tank or an air canister (or mask), this is the last step in the decontamination procedure. Worker's air tank is exchanged and new outer gloves and boots donned, and joints tapped. Worker returns to duty.
Station 5 Boots Gloves & Outer Garment Removal	Remove boots, suit, and inner gloves and deposit in separate containers lined with plastic.
Station 6 SCBA / Respirator Removal	SCBA back pack and face-piece respirator is removed (avoid touching face with fingers). SCBA or respirator is deposited on plastic sheets.
Station 7 Field Wash	Shower if highly toxic, skin corrosive or skin absorbable materials are known or suspected to be present. Wash hands and face.

EXHIBIT 7.9 **MAXIMUM DECONTAMINATION LAYOUT - LEVEL B PROTECTION (FLOWCHART)** **PAGE 1 OF 1**

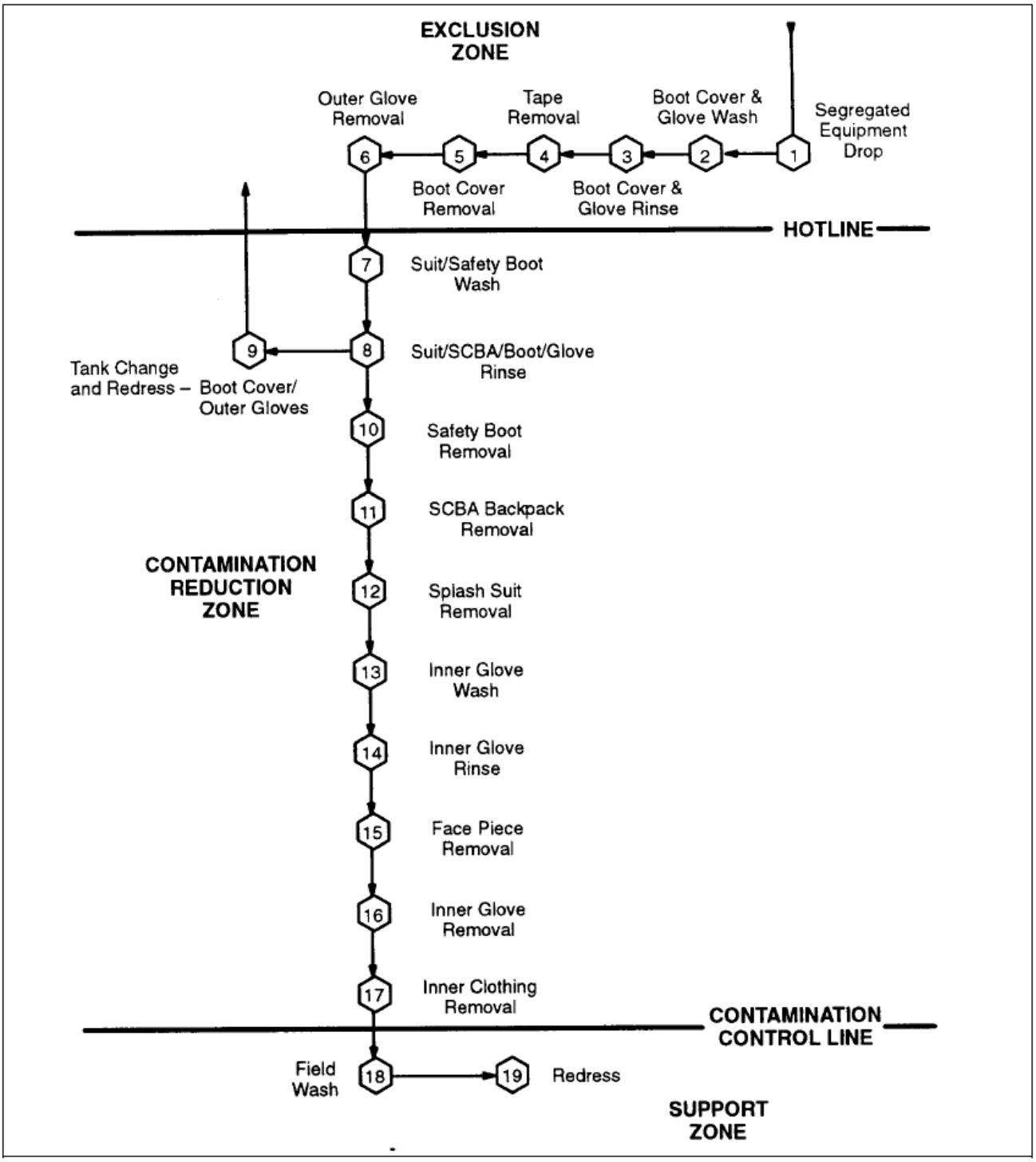
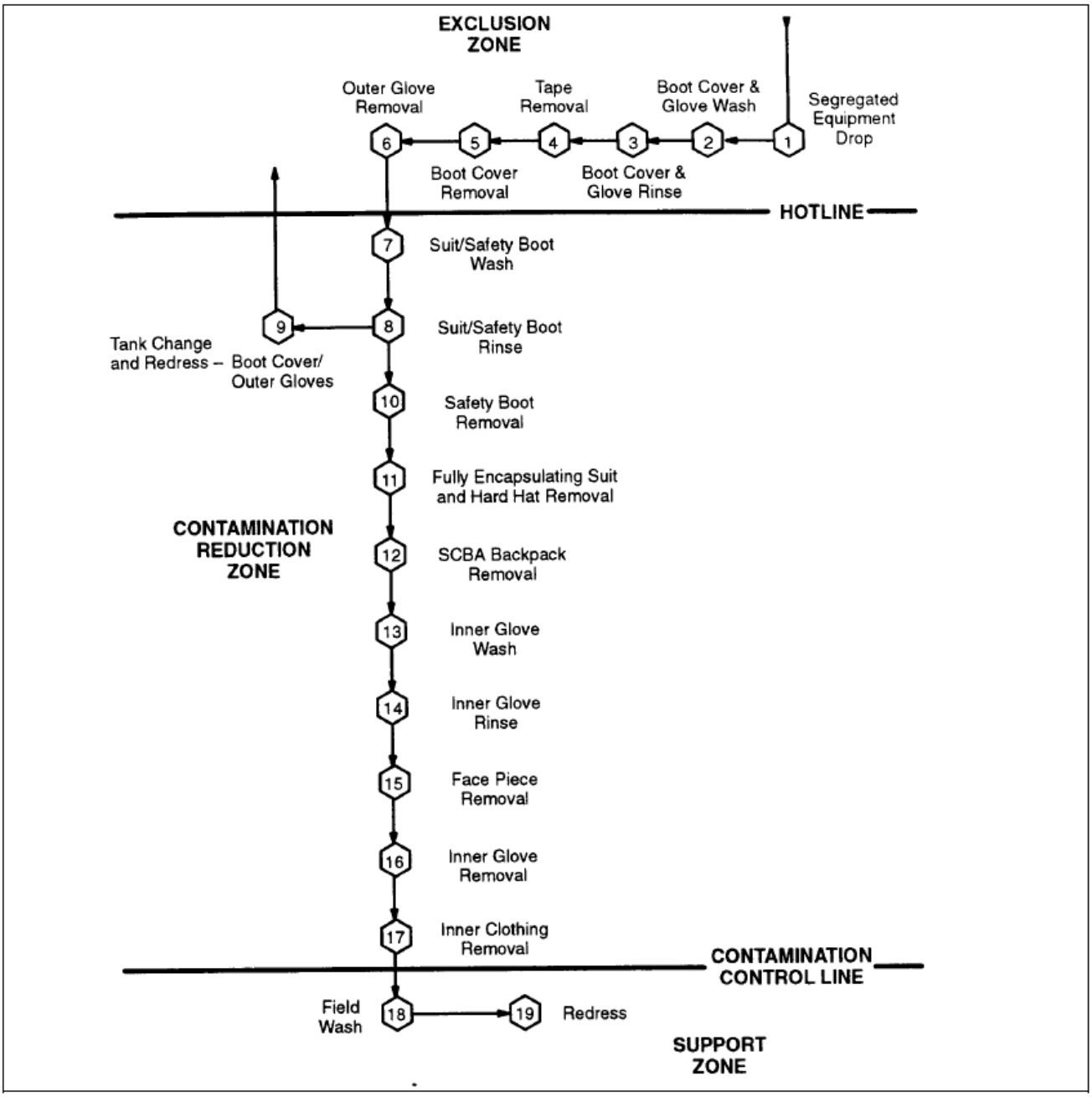


EXHIBIT 7.10 **MAXIMUM DECONTAMINATION LAYOUT - LEVEL A PROTECTION (FLOWCHART)** **PAGE 1 OF 1**



Station 1 Segregated Equipment Drop	Deposit equipment used on plastic drop cloths or in different containers with plastic liners. During hot weather, a cool down station may be set up in this area.
Station 2 Outer Glove & Boot Cover Wash	Scrub outer boot covers and gloves with decontamination solution or detergent / water.
Station 3 Boot Cover & Glove Rinse	Rinse off decontamination solution from Station 2 using copious amounts of water.
Station 4 Tape Removal	Remove tape around boots and gloves, and deposit in containers with plastic liner.
Station 5 Boot Cover Removal	Remove boot covers and deposit in container with plastic liner.
Station 6 Outer Glove Removal	Remove outer gloves and deposit in container with plastic liner.
Station 7 Suit / Safety Boot Wash	Wash encapsulating suit and boots using scrub brush and copious amounts of decontamination solution or detergent / water. Wrap SCBA regulator with plastic to keep out water. Wash backpack assembly with sponges or cloths.
Station 8 Suit / SCBA / Glove Rinse	Rinse off decon solution or detergent water using copious amounts of water. Repeat as many times as necessary.
Station 9 Tank Change	If a worker leaves the Exclusion Zone to change an air tank, this is the last step in the decontamination procedure. Worker's air tank is exchanged and new outer gloves and boots donned, and joints taped. Worker returns to duty.
Station 10 Safety Boot Removal	Remove safety boots and deposit in container lined with plastic.
Station 11 Fully Encapsulating Suit & Hard Hat Removal	With assistance, fully encapsulated suit is removed and laid out on a drop cloth or hung up. Hard hat is removed. Hot weather rest station may be setup within this area for personnel returning to the site.
Station 12 SCBA Backpack Removal	While still wearing facepiece remove backpack and place on table. Disconnect hose from regulator valve and proceed to next station.
Station 13 Inner Glove Wash	Wash inner gloves with decon solution or a detergent / water that does not harm skin. Repeat as many times as necessary.
Station 14 Inner Glove Rinse	Rinse inner gloves with water. Repeat as many times as necessary.
Station 15 Face-piece Removal	Remove facepiece. Avoid touching face with gloves. Deposit in container with plastic liner.
Station 16 Inner Glove Removal	Remove inner gloves and deposit in container with plastic liner.
Station 17 Inner Clothing Removal	Remove clothing and place inlined container. Do not wear inner clothing off site since there is a possibility that small amounts of contaminants might have been transferred in removing chemical suits.
Station 18 Field Wash	Shower if highly toxic, skin corrosive or skin absorbable materials are known or suspected to be present. Wash hands and face if shower is not available.
Station 19 Redress	Put on clean clothes.

A. PHYSICAL REMOVAL

1. Contaminant Removal
   - Water rinse, using pressurized or gravity flow
   - Chemical leaching and extraction
   - Evaporation/vaporization
   - Pressurized air jets
   - Scrubbing/scraping
   - Steam jets
2. Removal of Contaminated Surfaces
   - Disposal of deeply permeated materials, e.g., clothing, floor mats, seats
   - Disposal of protective coverings/coatings

B. INACTIVATION

1. Chemical Detoxification
   - Halogen stripping
   - Neutralization
   - Oxidation/reduction
   - Thermal degradation
2. Disinfection/Sterilization
   - Chemical Disinfection
   - Dry heat sterilization
   - Gas/vapor sterilization
   - Irradiation
   - Steam sterilization

Appendix F
Response to Comments

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Document: Draft Final Remedial Action Work Plan, Site 1 - Former Drum Marshalling Area, Naval Weapons Industrial Reserve Plant, Bethpage, New York, January 2019
Date: 01-Mar-19
Reviewer: Jason Pelton, Project Manager, NYSDEC

Comment Number	Section Number; Page Number	Reviewer	Comment	Response
1	Table of Contents, List of Figures	NYSDEC	The list of figures on Page 1-1 is incomplete. The list only includes Figures 1 and 2. Additionally, the page numbering needs to be corrected for the two pages after the Table of Contents.	All figures have been added to the Table of Contents.
2	Section 2.2, page 2-2	NYSDEC	Should the cesspool diameter be 10-feet instead of 10-inches? This dimension is not consistent with Drawing C-501.	This sentence has been revised as follows: "These cesspools were approximately 10-ft. in diameter and 16-ft. deep."
3	Section 2.7, page 2-4	NYSDEC	The text in the third paragraph states, "However, based on previous investigations detailed in the 2018 ROD (Navy, 2018), there are no cleanup levels for this remedial action." The Navy's 2018 Record of Decision for Site 1 does provide cleanup levels for site-related contaminants in soil, groundwater and soil vapor, and these cleanup levels should be documented in this work plan.	This sentence has been deleted and replaced with the following: "The cleanup levels for Site 1 are presented in Table 2-8 of the OU4 ROD (Navy, 2018)."
4	Section 5.2.1, page 5-2	NYSDEC	Please include the NYSDEC and the NYSDOH on the attendees list for the pre-construction meeting.	NYSDEC and NYSDOH will be included on the attendee list for the Pre-Construction Meeting.
5	Section 5.4.2.2, page 5-4	NYSDEC	Will a sump be constructed within the decontamination pad?	Yes. This sentence has been revised as follows: "Decontamination water will be pumped from the decontamination pad using a six-in. diesel pump and sump with a 25-ft. hose…"
6	Section 6.2, page 6-11	NYSDEC	Will the base of the concrete tank be broken apart and removed?	Per the Performance Work Statement (NAVFAC, June 2018) and Section 6.2 of the RAWP, the tank will be demolished to below finish grade elevation design (approximately two-ft. bgs). The depth of the tank is unknown at this time, but all parts of the tank, including the base of the tank, encountered within the prescribed excavation depth will be broken apart and removed.
7	Section 6.2, page 6-11	NYSDEC	Is there data that documents the quality of the soil beneath the former settling tank?	Based on previous sampling conducted at Site 1, there is no existing data that documents the quality of the soil beneath the former settling tank.
8	Section 6.4, page 6-12	NYSDEC	Has the earthen berm along the eastern portion of the site been sampled and is the berm part of the shallow excavation? In particular, when excavation from 0'-2' occurs is this from the top of the berm or from the original grade?	The following discussion has been added to Section 6.4: "Overburden soils will also be encountered in the berms on the eastern side of the site. The zero- to two-ft. bgs excavation will begin once the berms have been removed. The overburden soils from these areas are considered clean and will be stockpiled for reuse as backfill during site restoration."
9	Section 5.0, page 5-1	NYSDEC	The text outlines activities that will take place prior to mobilization, including a Pre-Construction and Mutual Understanding Meeting with the Town of Oyster Bay. The Navy should also consider meeting with the residents on 11th Street near the site to go over project specific activities that could impact the residential properties and the steps that will be taken to prevent those impacts from occurring.	Residents of 11th Street were notified and a public meeting was held on February 6, 2019 at the Bethpage Community Center to discuss project specific activities and the steps that will be taken to prevent those impacts from occurring.
10	Section 6.1, page 6-11	NYSDEC	Will the vegetation/mulch be disposed of off-site? If so, should this material be sampled for PCBs and metals prior to off-site disposal/reuse?	The intent is to chip vegetation for reuse on-site as mulch. APTIM does not intend to sample the vegetation. According to the EPA, it does not appear that there is significant uptake of PCBs by plants.

Document: Draft Final Remedial Action Work Plan, Site 1 - Former Drum Marshalling Area, Naval Weapons Industrial Reserve Plant, Bethpage, New York, January 2019
Date: 01-Mar-19
Reviewer: Jason Pelton, Project Manager, NYSDEC

Comment Number	Section Number; Page Number	Reviewer	Comment	Response
18	Section 6.4.4, page 6-14	NYSDEC	How will the excavation sequencing work? The 0'-2' excavation area is beneath the pavement that is used as the excavated soil stockpile area.	The stockpile will be placed in the Northern Area while the Southern Area is being excavated. Once the Southern Area is backfilled, the stockpile areas will be relocated to the area south of the Dry Well Area. The Dry Well Area will be excavated second, followed by the Central Area and Northern Area.
19	Section 6.4.5, page 6-15	NYSDEC	The text should be revised to state "…elevated PCB and VOC concentrations…"	This sentence has been revised as suggested.
20	Section 6.5.3, page 6-17	NYSDEC	Should the text be revised to state "…placing a large patch…"?	This sentence has been revised as suggested.
21	Section 6.6.2, page 6-17	NYSDEC	Is there a basis for assuming that 200 cubic yards of concrete will not be contaminated?	It is unknown whether the concrete is contaminated, so discrete grab chip waste characterization samples will be collected from the concrete prior to off-site disposal or recycling as discussed in Section 6.6.2.
22	Section 7.3, page 7-1	NYSDEC	Please include the NYSDEC project manager and the NYSDOH project manager on the Bi-Weekly QC Meetings with participation through a conference call.	The NYSDEC project manager and NYSDOH project manager will be included in the Bi-Weekly QC Meetings with participation through a conference call.
23	Appendix D, EPP, Section 7-1, Page 7-1	NYSDEC	The text describes air pollution control measures that will be implemented throughout the project. However, the plan does not include air monitoring activities to specifically address the Community Air Monitoring Plan (CAMP) requirements detailed in DER 10. This work plan should be revised to include dust and volatile organic compound air monitoring activities that will meet the requirements of the generic CAMP. Also, the CAMP data generated during this project should be provided to the State on at least a weekly basis throughout the duration of ground intrusive activities. The work plan should also include provisions to notify the State if exceedances of the action levels provided in the generic CAMP occur during the project, and the actions that were taken to address the excursions.	The following verbiage from the Site Safety and Health Plan was added to Section 7.1 of the EPP: "This action level [1.0 mg/cubic meter] is based on the NY State Generic Community Air Monitoring Plan and levels of contaminants found in the soil. An industrial hygiene calculation was utilized to determine potential levels of airborne contamination, based on analytical results from previous soil sampling activities. This action level is conservative, as to protect employees as well as the surrounding community....VOC concentrations will be monitored using a photoionization detector." As mentioned in Section 7.1, all direct particulate matter concentration readings will be documented on APTIM's Air Monitoring Data Sheet. As stated in Section 7.1, if the action level is reached, APTIM will stop work immediately and additional dust control alternatives will be evaluated.
24	Appendix D, EPP, Section 1.1, page 7-1	NYSDEC	The text needs to be revised to state "…from the ground surface to 30 feet…"	This sentence has been revised as suggested.
25	Appendix D, EPP, Section 9.3, page 9-2	NYSDEC	The text needs to discuss the collection of decontamination water.	The following has been added to Section 9,3: "Decontamination water will be pumped from the decontamination pad using a six-in. diesel pump with a 25-ft. hose through a 10-oz. filter bag to be stored in a 20,000-gallon portable storage tank. Prior to off-site disposal, stored decontamination water will be sampled for waste characterization analysis."
26	Appendix E, WMP, Section 1.1, page 1-1	NYSDEC	The text needs to be revised to state "…from the ground surface to 30 feet…"	This sentence has been revised as suggested.
27	Appendix E, WMP, Section 4.3.5, page 4-5	NYSDEC	During the February 6, 2019 community update meeting, the APTIM representative indicated that trucks will haul contaminated materials to offsite disposal facilities might also be used to bring clean backfill materials to the site. The document needs to describe how the truck (including the truck bed) would be decontaminated to ensure that the backfill materials would not become contaminated.	The following has been added to Section 4.3.5: "Haul trucks will be lined to ensure the truck beds do not become contaminated." Additionally, if trucks are used to haul both clean fill and waste soils, the trucks will arrive with a load of clean fill and leave with a load of waste material.
28	NA	NYSDEC	Please include in Appendix F (Response to Comments) the responses to comments provided by the Town of Oyster Bay and residents during the February 6, 2019 Community Update Meeting.	Responses to the comments provided by the Town of Oyster Bay and residents during the February 6, 2019 Community Update Meeting will be provided in Appendix F of the RAWP.

Document: Draft Final Remedial Action Work Plan, Site 1 - Former Drum Marshalling Area, Naval Weapons Industrial Reserve Plant, Bethpage, New York, January 2019
Date: 04-Mar-19
Reviewer: John C. Tassone, Deputy Commissioner, and Richard W. Lenz, PE, Commissioner, Department of Public Works Town of Oyster Bay

Comment Number	Section Number	Reviewer	Comment	Response
1	Section 5.4.2.1	Town of Oyster Bay	Section 5.4.2.1 states that the materials storage areas will be constructed with concrete barriers. Plan C-501 shows the barriers constructed of hay bales.	As stated in Section 5.4.2.1, the concrete barriers will ensure a longer life cycle than hay bales and will provide a more durable barrier to protect against contaminant migration.
2	Section 6.0	Town of Oyster Bay	Proposed work hours are not provided. The Town has typically placed restrictions on remedial programs located within residential areas to 7 am - 4 pm, with no work on holidays or weekends without permission.	Work hours are from 0700 - 1730 each day. APTIM will notify the Navy if holiday or weekend work is required.
3	Section 6.0	Town of Oyster Bay	An air monitoring program for dust and contaminants is not mentioned.	The following has been added to Section 6.0: "Air monitoring and dust control methods during excavation are discussed in the EPP (Appendix D)."
4	Section 6.0	Town of Oyster Bay	Details of dust control measures are not detailed.	The following has been added to Section 6.0: "Air monitoring and dust control methods during excavation are discussed in the EPP (Appendix D)."
5	Section 6.0	Town of Oyster Bay	Due to the proximity of homes and businesses, a vibration monitoring plan is requested during the installation and removal of sheet piling.	A seismic monitoring plan is currently being developed. The following text has also been added to Section 6.3: "Seismic activity will be monitored along 11th Street and the southwest corner of the site throughout sheet piling activities. Baseline seismic activity of the area will be measured before the commencement of sheet piling installation."
6	Section 6.0	Town of Oyster Bay	While a southern soil stockpile area for contaminated soils is detailed, a contaminated soil area on the western side (for Southern Area Excavation) is not shown.	The stockpile will be placed in the Northern Area while the Southern Area is being excavated. Once the Southern Area is backfilled, the stockpile areas will be relocated to the area south of the Dry Well Area. An updated phasing plan figure will be provided once completed.
7	Section 6.0	Town of Oyster Bay	Since there are several waste streams as part of this work (clean soils, contaminated soils, concrete, construction debris) it is questionable how the proposed quantities will be maintained on-site within the designated stockpile areas. The plan states that piles will be limited to 500 cubic yards, but no details are provided about the overall dimensions of the individual pile containment areas, and how high the stockpiles will be.	The following has been added to Section 6.4: "Stockpiles will be sampled for waste characterization as soon as possible following excavation to minimize the amount of time spent in the excavated materials staging area. Because of limited space on site, stockpiles will not remain on site longer than necessary to receive waste characterization analytical results and conduct T&D activities." The dimensions of the individual pile containment areas will vary depending on the phase of excavation and available space on site.
8	Section 6.0	Town of Oyster Bay	Provide details of how long a waste stockpile will remain on site, including excavation, testing and offsite transport.	The following has been added to Section 6.4: "Stockpiles will be sampled for waste characterization as soon as possible following excavation to minimize the amount of time spent in the excavated materials staging area. Because of limited space on site, stockpiles will not remain on site longer than necessary to receive waste characterization analytical results and conduct T&D activities."
9	Section 6.0	Town of Oyster Bay	The restoration program should include the installation of permanent physical or natural stormwater retention facilities to prevent the flow of stormwater off-site and into the Town stormwater system. A minimum storage volume of 3 inches should be provided in accordance with Town standards.	As stated in Section 6.9, the site will be graded to promote positive drainage towards the existing stormwater system in the west, consistent with pre-construction conditions. Construction activities will not change the stormwater flow to the existing stormwater system.

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10	EPP Section 7.0	Town of Oyster Bay	The air monitoring program only consists of dust monitoring. A real-time monitoring program for the contaminants of concern should also be implemented.	Contaminants of concern will be indirectly monitored through dust monitoring, as COCs will enter the air through dust. The following has been added to Section 7.1: "This action level [1.0 mg/cubic meter] is based on the NY State Generic Community Air Monitoring Plan and levels of contaminants found in the soil. An industrial hygiene calculation was utilized to determine potential levels of airborne contamination, based on analytical results from previous soil sampling activities. This action level is conservative, as to protect employees as well as the surrounding community....VOC concentrations will be monitored using a photoionization detector."
11	TCP Section 3.0	Town of Oyster Bay	No plans are provided specific to the proposed partial street closure of 11th Street.	Section 3.7 has been added to the TCP to discuss the partial street closure of 11th Street. A new figure will be added to provide details on the concrete barriers and fence to be installed along 11th Street.
12	TCP Section 3.2	Town of Oyster Bay	Section 3.2 should also include a requirement that loaded vehicles leaving the site should be covered or tarped prior to leaving the site.	The following has been added to Section 3.2: "Trucks will be inspected to ensure the bed is covered and there is no loose debris prior to leaving the site."
13	SWPPP	Town of Oyster Bay	The Stormwater Pollution Prevention Plan and Erosion and Sediment Control Plan should be combined into a single document.	Comment noted.
14	SWPPP	Town of Oyster Bay	The plan should include the installation of physical or natural stormwater retention facilities to prevent the flow of stormwater off-site and into the Town stormwater system. A minimum storage volume of 3 inches should be provided in accordance with Town standards.	Due to the flatness of the site, stormwater is expected to infiltrate into the excavation areas. The following has been added to Section 6.6: "It is expected that rainfall will infiltrate back into the excavation areas, and dewatering activities are not anticipated on site." As discussed in Section 4.0, compost filter socks will also be utilized to prevent stormwater migration from the site.
15	SWPPP Section 4.0	Town of Oyster Bay	There is a concern over the use of a compost filter sock for erosion control due to the potential for odors with homes in close proximity. It is requested that alternate means be utilized.	The compost filter socks consist of mulch and "shall possess no objectionable odor" in accordance with the New York State Standards and Specifications for Erosion and Sediment Control.
16	SWPPP Section 4.0	Town of Oyster Bay	Filter fabric should be installed along the perimeter or temporary construction fencing to prevent dust migration.	The following has been added to Section 4.0: "Privacy screens will be utilized along the temporary construction fencing to prevent dust migration off-site."
17	SWPPP Section 6.0	Town of Oyster Bay	The details of the vehicle and equipment washing system and procedures are not provided in the section or in the drawings.	The following has been added to Section 6.5: "The decontamination area will be constructed using eight-ounce (oz.) nonwoven geotextile, six-mm polyethylene sheeting, one- to four-in. aggregate, and wooden mats. Decontamination water will be pumped from the decontamination pad using a six-in. diesel pump and sump with a 25-ft. hose through a 10-oz. filter bag to be stored in a 20,000-gallon (gal) portable storage tank. Prior to off-site disposal, stored decontamination water will be sampled for waste characterization analysis. All vehicles and equipment utilized in the Exclusion Zone will be decontaminated in the equipment decontamination area prior to leaving the site. Site materials such as dirt and mud from vehicles will be removed via power washer prior to accessing a public roadway. Equipment contacting known or suspected PCB-impacted material shall be decontaminated at the work area prior to relocation to the support zone."
18	SWPPP Section 6.0	Town of Oyster Bay	A construction detail for the soil stockpile areas is not provided.	An updated figure will be provided to detail the soil stockpile area construction with the concrete barriers.

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19	SWPPP Section 8.0	Town of Oyster Bay	Section should note that the compost filter sock must be replaced no later than after 6 months of use.	As stated in Section 4.0 of the ESCP and in accordance with the New York State Standards and Specifications for Erosion and Sediment Control, biodegradable filter socks shall be replaced after six months; photodegradable filter socks after one year. Polypropylene socks shall be replaced according to the manufacturer's recommendations.
20	SWPPP Appendix A	Town of Oyster Bay	Maps and design drawings are not provided. At a minimum, the existing and final conditions plans/surveys, and a plan showing the location of the various erosion control measures should be provided.	Appendix K has been added to the SWPPP to include applicable Design Drawings, which include existing and final conditions plans/surveys and locations of erosion and sediment control measures.
21	ESC Section 2.0	Town of Oyster Bay	The major activities should include the area of disturbance associated with each activity.	Each major activity will encompass the entire site. The acreages of each excavation area have been added to Section 2.1.
22	ESC Section 2.0	Town of Oyster Bay	The excavation activity should be broken down into the individual excavation areas.	The scheduled dates for each excavation phase have been added to Section 2.1.
23	ESC Section 6.0	Town of Oyster Bay	None of the listed maps are provided and are required to perform a full review.	The following has been added to Section 6.0: "A site plan including the E&S control locations is provided as Attachment A. Applicable Project Design Drawings (Tetra Tech, 2018), including existing and proposed topographic maps and E&S control details, are provided as Appendix K to the SWPPP. The Conceptual Site Model, which includes existing drainage patterns and site conditions, is provided as Figure 3 of the SWPPP."

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Date: 01-Mar-19
Reviewer: Jason Pelton, Project Manager, NYSDEC

Comment Number	Section Number; Page Number	Reviewer	Comment	Response
11	Section 6.4, page 6-12	NYSDEC	The Record of Decision indicates that confirmation sampling will be completed under Alternative S-6A, but the RAWP indicates that confirmation sampling will not be completed. A review of historic soil sampling used to delineate the excavation areas shows PCBs present at concentrations up to 58 ppm in soil along the eastern part of the 0'-2' excavation area. Based on this, confirmation soil samples should be collected to assess excavation limits and confirm the quality of soil left in place.	Per Navy instruction, APTIM will collect documentation samples along the Eastern perimeter of the 0'-2' excavation area in the 0"-2" interval at the following RI Addendum (2105) soil boring locations: BPS1SB3047, BPS1SB3031, BPS1SB3051, BPS1SB3032, BPS1SB3033, BPS1SB3034, BPS1SB3035, and BPS1SB3036. Additionally, APTIM will collect confirmation samples in the Eastern corner of the 2'-10' excavation area in the 2'-6' interval at the location of soil boring BPS1SB3031. A specific Sampling and Analysis Plan Adendum will be created to reflect the addition of these confirmation samples. The 2015 RI Addendum soil boring locations are indicated in Figure 2-3 (surface soil)and Figure 2-3 (subsurface soil) of this report.
12	NA	NYSDEC	Soil and groundwater samples should be submitted to a NYSDOH Environmental Laboratory Analytical Program (ELAP) certified laboratory for analysis.	SGS Accutest Laboratories, located in Orlando, Florida, is a NYSDOH ELAP certified laboratory. Certificates are provided in Appendix A of the Sampling and Analysis Plan.
13	Section 6.4, page 6-12	NYSDEC	The RAWP and related appendices need to discuss how Toxic Substances Control Act (TSCA) materials will be addressed during remedial work. This should include a discussion of the specific steps that will be taken (or have been taken) to pre-characterize the extent of the TSCA soils, and that will be taken during the excavation (including confirmation sampling), management (stockpiling), and transportation/disposal of these materials.	The following discussion has been added to Section 6.6.1, Soil Waste Characterization Sampling: "Excavated soils will be pre-characterized as Toxic Substances Control Act (TSCA) hazardous waste based on previous sampling conducted by the Navy. TSCA soil stockpiles will remain segregated from other excavated soils until characterization is confirmed through waste characterization sampling. Once analytical results have been received, like soil stockpiles will be combined. TSCA hazardous soil will remain segregated from non-hazardous soil. Hazardous and non-hazardous soil stockpiles will be transported and disposed of accordingly at the approved facilities."
14	Section 6,4, page 6-12	NYSDEC	The RAWP text indicating that excavation will begin in the north and move south contradicts the text on G-001, Site 1 Remediation Plans which states that excavation work will occur from the south to the north.	APTIM is in the process of updating the excavation sequencing from south to north. As the excavation work is being phased to accomodate onsite tenants parking needs, it is expected the excavating and soil stock piling will be shifted several times. The RAWP will not be updated but new phasing drawings will be provided once completed.
15	Section 6.4, page 6-12	NYSDEC	The RAWP and related appendices need to discuss how water (e.g. from rainfall events) in the excavations will be managed.	The following has been added to Section 6.4: "During excavation activities, rainfall is expected to infiltrate back into the ground. Sheet piling and E&S controls will prevent stormwater runoff from entering the excavation areas. Excavation activities will not reach the groundwater table at Site 1. Ponding of water, and therefore dewatering activities, are not anticipated. "
16	Section 6.4, page 6-13	NYSDEC	The RAWP should indicate that the stockpiled soil will be maintained under cover to prevent runoff and/or dust generation.	The following has been added to Section 6.4: "When not in use, all soil stockpiles will be covered with polyethylene sheeting or tarps to prevent soil migration from the containment cell."
17	Section 6.4.3, page 6-14	NYSDEC	With regard to the text in the 3rd paragraph, where is soil from 2'-10' present in the Central Area that is clean and needs to be stripped off for use as backfill to get to the contaminated deeper soil?	There will be no clean overburden from 2'-10' as both of the 10'-20' excavations are located within the 2'-10' excavations. The following has been deleted from Section 6.4.3: "Areas where clean overburden material is present from two to 10 ft. bgs will be excavated first to prevent cross contaminated and stockpiled in the northern area to be used as backfill. Following excavation of clean overburden material, contaminated material will be excavated to the design limits to a depth of 10 ft. bgs."