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# PROPOSED REMEDIAL ACTION PLAN FOR SITE 17 FORMER BUILDING 32 GOULD ISLAND OPERABLE UNIT 6 (OU 6) NS NEWPORT RI

3/1/2014

TETRA TECH

# Proposed Plan

## Site 17 – Former Building 32, Gould Island
## Operable Unit 6
## Naval Station (NAVSTA) Newport
## Newport, Rhode Island

### The Proposed Cleanup

This Proposed Plan has been prepared in accordance with federal laws to present the Navy's proposed cleanup approach for Site 17, Former Building 32, Gould Island, located at the Naval Station (NAVSTA) Newport, in Newport, Rhode Island. This plan describes the Navy's proposed cleanup (remedy) for the site, which after careful study and consideration, consists of the following:

- Soil - Complete **excavation and off-site disposal** of soil exceeding industrial cleanup goals and Leachability Criteria.
- Sump debris – **Excavation and off-site disposal** of debris from sumps and trenches within the former Building 32 foundation.
- Groundwater – **Monitored natural attenuation** (MNA).
- Sediment – **Dredging and off-site disposal** of sediment from the Stillwater Area. **Limited monitoring** at the Northeast Shoreline.
- **Land use controls** (LUCs) to control access to the site and control use of the property.
- **Five-year reviews** of the remedy to ensure continued protection of human health and the environment.

This document provides the public with information about the proposed cleanup.

### Let us know what you think!

*Mark Your Calendar!*

**PUBLIC COMMENT PERIOD**
**March 13, 2014 to April 12, 2014**

The Navy will accept comments on the Proposed Plan for Site 17 during this period. **Send written comments, postmarked no later than Saturday, April 12, 2014, to**:

Ms. Lisa Rama
Public Affairs Office
690 Peary Street
Naval Station Newport
Newport, RI 02841
Fax: (401) 841-2265
Lisa.Rama@navy.mil

**PUBLIC MEETING AND PUBLIC HEARING**
**Wednesday, March 19, 2014, 7:00 p.m. to 8:30 p.m.**
**Courtyard Marriott**
**9 Commerce Drive**
**Middletown, Rhode Island**

The Navy will hold a public meeting at 7:00 p.m. to provide information about this Proposed Plan. Following a presentation describing the planned site cleanup, the Navy will host an informal question-and-answer session. The Navy will then hold a formal Public Hearing at 8:00 p.m. until all comments on the Proposed Plan are heard. It is at this Hearing that an official transcript of comments will be entered into the record.

***For more information, visit the local Information Repository identified at the end of this Proposed Plan.***

## Introduction

This Proposed Plan provides information on the Navy's preferred cleanup plan for the Former Building 32 area of Gould Island (Site 17), which is part of NAVSTA Newport and is located in the municipality of Jamestown, Rhode Island. This Plan has been prepared to inform the community of the Navy's strategy for the proposed cleanup approach, and to

encourage community input on the Proposed Plan and overall environmental cleanup process for Site 17 (Note: A glossary of terms is provided at the end of this document.) Site 17 is identified by the U.S. Environmental Protection Agency (USEPA) as Operable Unit (OU) 6 of the Naval Education and Training Center (NETC) Superfund Site.

Federal and state environmental laws govern cleanup activities at federal facilities. A federal law called the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), better known as "Superfund", provides procedures for investigating and cleaning up sites where releases of hazardous materials pose a risk to human health or the environment. In accordance with provisions of CERCLA, the Navy is implementing cleanup of designated sites at NAVSTA Newport to restore the environmental condition of the property. The Navy works closely with the USEPA and the Rhode Island Department of Environmental Management (RIDEM) to achieve this objective. The Navy is the lead agency for all investigation and cleanup programs ongoing at NAVSTA Newport.

As the lead agency, the Navy has prepared this Proposed Plan for Site 17 in accordance with CERCLA Section 117(a) and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan. This Plan and its associated public involvement opportunities fulfill the Navy's public participation responsibilities under these laws. This Proposed Plan was developed with support from the USEPA and RIDEM.

The purpose of this Proposed Plan is to:

- Encourage public review and comment on the preferred cleanup plan.
- Provide background information on Site 17, which includes: a description of the site, a summary of the results of environmental investigations, and the conclusions of the human health risk assessment (HHRA) and the ecological risk assessment (ERA).
- Describe cleanup alternatives (Remedial Action Alternatives) considered for Site 17.
- Identify and explain the Navy's preferred cleanup remedy for the site.

Once the public has had the opportunity to review this Proposed Plan, the Navy, USEPA, and RIDEM will carefully consider all comments received and, based on the public comments, could modify the cleanup plan or even select a different plan from the remedy currently proposed. Ultimately, the selected remedy will be documented in a Record of Decision (ROD) for the site. The Navy will respond to all comments received during the comment period and the public hearing in a document called the Responsiveness Summary. The Responsiveness Summary will be issued with the ROD.

This Proposed Plan presents the highlights of key information from previous investigations at Site 17, many of which have been presented to the public at Restoration Advisory Board (RAB) meetings. More detailed information about Site 17 can be found in the Phase 1 and Phase 2 Remedial Investigation (RI) reports, Feasibility Study (FS), related regulatory agency correspondence, and other documents, which in combination form the Administrative Record for this Proposed Plan. The Administrative Record is available for review at the public Information Repository listed at the end of this document. The Navy encourages the public to review these documents to gain a better understanding of the environmental activities completed at Site 17.

## Scope and Role of the Response Action for Site 17

Site 17 is one of several sites identified at NAVSTA Newport for cleanup under CERCLA. Each of these sites progresses through the cleanup process independently of the others and, as such, the Proposed Plan for Site 17 at Gould Island is not expected to have an impact on the strategy or progress of cleanup for other sites at NAVSTA Newport. Separate Proposed Plans have been, and will be issued for these other sites as they progress through the investigation and cleanup process.

## Site Background and Characteristics

### *Where is the Site?*

Gould Island is located in the East Passage of Narragansett Bay, approximately 1.5 miles west of Newport, Rhode Island, between Aquidneck and Conanicut Islands, as illustrated in Figure 1. Site 17 encompasses the Building 32 area and the soil, groundwater and sediment where contaminants from the former facility and its operation have come to reside. Building 32 is located on the northeast end of Gould Island and occupied approximately six acres of land, not including the pier structure and Building 35. The Navy retains approximately 9 acres, at the north end of Gould Island which has been investigated as a part of site 17.

The southern part of the island (reportedly 46 acres) is owned by the State of Rhode Island. Building 35, located on the pier at the north end of the island is the

only operational facility at Gould Island and is occupied part time by Navy staff.


**Figure 1 - Site 17 (Gould Island) Location in the West Passage of Narragansett Bay**

### *What was the Site used for?*

The site was formerly the home to a Navy torpedo overhaul shop from the 1940s until it ceased major operations in the 1950s. During that time, torpedoes were brought to the overhaul shop for dismantling, cleaning and reassembly. Operations within Building 32 included degreasing, parts washing, electroplating, sandblasting, mechanical and electrical testing, etc. Wastes generated from the electroplating and degreasing operations included muriatic acid, chromic acid, copper cyanide, sodium cyanide, sodium hydroxide, nickel sulfate,"Anodex" cleaner, and degreasing solvents.

Outside the building, but pertinent to the building operations, polychlorinated biphenyls (PCBs) were released from electrical transformers housed in small buildings. Although removal actions have addressed PCBs in the on-shore areas, PCBs have intermingled with other contaminants from Building 32 and come to reside in sediment near the shoreline. Polycyclic aromatic hydrocarbons (PAHs), presumably from degreasers used at the facility, were found within the former building and on the ground surface where storm drains ultimately carried them to nearby marine sediments. Metals, used and produced through electroplating and sandblasting operations in the southwest corner of the former Building 32, were also released to the sediments at the Northeast Shoreline of Gould Island via building drainage systems. Some of these drainage systems originated at the parts washing machines, and in the electroplating rooms of Building 32. Disposal of industrial waste in this manner was a common practice during the 1940s and 1950s.

### *What does Site 17 look like today?*

Gould Island is generally unoccupied, but may be accessed by trespassers, particularly via recreational boating. The former buildings at the site have previously been demolished to existing grade with the at-grade slab foundations left in place as shown below in Figure 2.

**Figure 2 - Foundation Slabs for former Building 33 (foreground) and Building 32 (background)**

At the northern end of Gould Island, where Site 17 is located, the island consists of a constructed shoreline that is a combination of filled land, man-made structures, and natural island formations. These include the Firing Pier, a rigging platform (a timber dock), a partial breakwater feature made of wood piles, and constructed shoreline (filled land behind bulkhead walls). The intertidal shoreline on the east and west shorelines of the site is subject to wave action and consists of a mixture of deteriorated, steel sheet-pile bulkhead wall and stony beach face.

The Firing Pier dominates the north portion of Gould Island. This pier extends north from the northern end of the island, and supports Building 35, which is an active test facility operated by the Naval Underwater Warfare Center (NUWC). The pier, Building 35, and the sediment underneath the pier are confirmed to be outside the Site 17 boundary and therefore outside the area identified for the remedial action described under this Proposed Plan.

The waters immediately north of the site are formed by a small boat basin referred to as the "Stillwater Area". This area is protected on the west side by the

pier and Building 35, and on the north side by a row of pilings that forms a wave break. During Building 32 operations, equipment and material were brought by barge to the island, within the Stillwater Area, and lifted by crane onto the rigging platform that bounded the north shoreline of Gould Island. Since operations ceased, the rigging platform has fallen into disrepair and portions have collapsed as the sheet piling wall has also deteriorated.

### *What were the investigation results?*

The Navy's investigations (see the text box "History of Site Investigations") have shown that site activities have resulted in the release of both organic and inorganic contaminants to site media. Results of these investigations indicated that:

- PCBs were released from transformer areas, and although removal actions have addressed them in the on-shore areas, residual concentrations of PCBs have intermingled with other contaminants in sediment and soil.

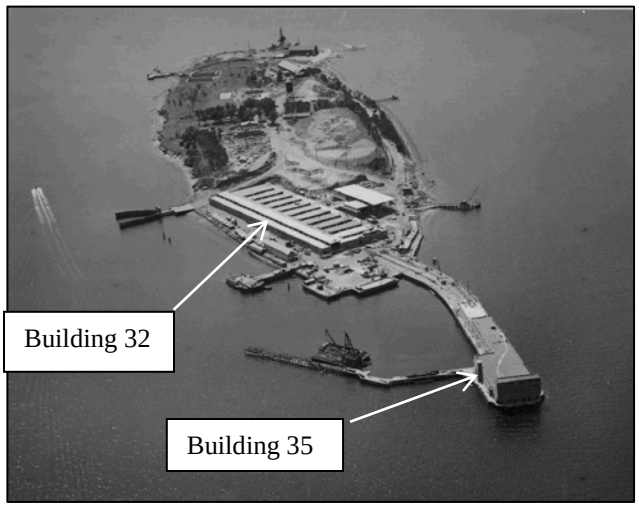



**Figure 3 - North end of Gould Island, 1943**

- PAHs, which are likely to have various origins, were found in soil within and around the former building footprint, where drains carried them to nearby marine sediments. One PAH, naphthalene, was also present in site groundwater.

- Metals used and produced through electroplating and sandblasting operations in the southwest corner of the former Building 32 were also released to nearby sediments via building and roadway drainage systems.

- The semi-volatile organic compound (SVOC), pentachlorophenol (PCP), was found in building sumps and in site groundwater. The presence of PCP may be a result of preservative treatment of the non-conductive wood parquet flooring material that was used in Building 32.
- A low level of the volatile organic compound (VOC), tetrachloroethene (PCE), was found in groundwater at only one location, near a former parts shop in former Building 32, indicating possible limited use of cleaning solvents.
- Manganese, a naturally occurring element in soil and rock, is present at elevated concentrations in the groundwater and is expected to be a secondary result of bacterial action that is breaking down organic materials, both natural and man-made, in the subsurface at the site.

Details of the investigation results are addressed in the RI Report and summarized in the FS. A graphic depiction of the site and summary of results and risks are provided as the Conceptual Site Model (CSM), presented as Figure 4 at the end of this document.

## History of Site Investigations

**1983 –** Initial Assessment Study (IAS) was completed for NAVSTA Newport and identified the Gould Island electroplating shop (a portion of Building 32) as an area for further study.

**1984 and 1986 –** A Verification Study and a Confirmation Study were completed for six sites at NAVSTA Newport, including Gould Island.

**1989 –** NAVSTA Newport was listed on USEPA's National Priority List (NPL) as the Naval Education and Training Center (NETC) Superfund Site.

**1992 –** A waste inventory was performed to determine the contents of miscellaneous drums and other containers.

**1992 –** Hazardous materials identified in the waste inventory were removed, including electroplating fluids, acids, and stored chemicals for electroplating and metals cleaning.

**1994 –** Building 44 Underground Storage Tanks (UST) Closure Assessment was completed in accordance with RIDEM UST regulations.

**1995 –** The Navy established the RAB for public involvement in the cleanup process.

## History of Site Investigations (cont.)

**1995 – 1996 –** Three USTs were removed from an underground vault to the west of Building 33. The Building 44 Phase I Environmental Assessment was completed.

**1997 –** Building 32 UST Site Investigation Report was completed.

**1997 –** A UST Site Investigation of the Building 44 Area (fuel storage) was conducted.

**2000 –** Building 44 Corrective Action was implemented to close in place five concrete USTs (No. 5 and No. 2 fuel oil) under Rhode Island's Tank Closure Rules. Approximately 9,000 cubic yards of contaminated soil were removed from this UST area and from the former location of two steel USTs (ethyl alcohol and No. 2 fuel) associated with Building 32.

**2000 –** A Study Area Screening Evaluation (SASE) was conducted for Building 32 and reported chlorinated solvents and PAHs in soil gas, and elevated levels of metals in sludge and soil samples. A 500-gallon diesel UST and associated contaminated soil was removed adjacent to the south end of building 32.

**2001 –** Corrective Action Groundwater Monitoring was implemented in the Building 44 area. This program continued for a period of 4 years and was discontinued in 2005.

**2001 through 2002 –** Building 32 was demolished and removed from the site. Asbestos-containing materials were removed prior to demolition, in accordance with local, state and federal regulations.

**2002 –** Remediation of PCB-contaminated concrete and soil was conducted to address former PCB transformer buildings. Concrete roadways and building foundations were removed from the site and soil contaminated with PCBs was excavated and disposed of under the Toxic Substances Control Act (TSCA).

**2005 –** Phase I RI was performed, including the baseline HHRA, an on-shore hydrogeological investigation, and a screening-level ERA. The final Phase I RI Report was published in December 2006.

**2010 –** Phase 2 RI was performed, including a Baseline ERA and a data gaps evaluation of soil. Risk to marine ecological receptors was confirmed. The final Phase 2 RI Report was published in May 2012.

***Where are the Site 17 contaminants located?***

Sediment in the Stillwater Area has become contaminated with PCBs and PAHs, likely through overland runoff from material spills at, and adjacent to, the rigging platform. Sediment at the Northeast Shoreline near the outfall pipes has been found to contain lower concentrations of PCBs, PAHs, and metals, most likely a result of discharges from these pipes which drained waste from specific building operations when the site was active.

In addition, there are specific areas of the on-shore portions of the site where PAHs and metals have been found, presumably as a result of the industrial nature of the former torpedo overhaul operations. Separate from the soil contaminants, a mixture of soil and debris is present within the sumps and equipment trenches within the former Building 32 foundation slab.

Finally, groundwater has been affected by industrial operations as well, and residual contamination (trace concentrations of PCP, naphthalene, and PCE), as well as manganese have been found in groundwater at the site.

## Removal Actions at Site 17

In 1992, a waste inventory and sampling report categorized waste materials present in Building 32. Elevated levels of cadmium and organic chemicals were detected in liquid samples collected from the Electroplating Shop. In response, the Navy initiated a removal action to dispose of liquid and semi-liquid waste from the plating shop area.

In 1997, the Navy performed UST removal and closure actions near Building 32. Building 32 was demolished in 2001 to the slab elevation.

PCB contamination was found in some of the concrete floors and soils of the transformer vaults and the switch house following the demolition. Remedial activities to remove PCB-contaminated soils and concrete were completed in 2002.

## Summary of Site Risks

Sample collection data generated and evaluated during the RI were used in the human health risk assessment (HHRA) and the ecological risk assessment (ERA) to determine if site contaminant concentrations pose a threat to human health and the environment under both current and potential future land use scenarios.

Because of the risks measured, it is the Navy's current judgment that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of pollutants or contaminants from this site that may present an imminent and substantial endangerment to public health or welfare or the environment.

### Human Health Risks

The HHRA estimated the "baseline risk," which is the likelihood of health problems occurring in persons exposed to contaminants on site if no cleanup actions were taken. The four-step process described below was used to estimate the baseline (existing) risk to human health. A summary of the findings is presented in Table 1.

***Step 1 - Hazard Identification.*** Chemicals of Potential Concern (COPCs) were defined as chemicals detected at Site 17 at concentrations that exceeded federal or state risk-based screening levels, where applicable. Chemicals with concentrations above these benchmarks were further evaluated in Step 2.

COPCs identified at Site 17 included the following:

- ***Surface Soil –*** Various PAHs and metals were identified in surface soil.
- ***Subsurface Soil –*** Various PAHs, SVOCs, PCBs, metals, and trichloroethene (TCE) were identified in subsurface soil.
- ***Groundwater –*** Various PAHs, SVOCs, VOCs, pesticides, metals, and the PCB group identified as Aroclor-1260 were identified in standing water in excavations, associated with shallow groundwater. Metals, naphthalene and PCE were detected in groundwater collected from monitoring wells.
- ***Sediment –*** Various PAHs, metals, and the PCB group identified as Aroclor-1260 were identified in the sediment.
- ***Shellfish (mussels and clams) –*** Various pesticides, metals, PAHs, and Aroclor 1260 were identified in the tissue of mussels and clams taken from the areas closest to the on shore release areas.

A full list of COPCs identified during the various investigations at Gould Island is provided in Appendix A-3 of the Feasibility Study Report.

***Step 2 - Exposure Assessment.*** This process examines possible pathways by which humans may contact (be exposed to) the identified COPCs, based on current and possible future land use scenarios.

For Site 17, potential receptors that were evaluated included:

- Current and future recreational visitors
- Current trespassers
- Current and future industrial workers
- Future construction workers
- Current and future subsistence fishermen
- Current and future recreational fishermen

For Site 17, potential exposure routes to COPCs that were evaluated include:

- Dermal contact, inhalation, and ingestion of soil
- Dermal contact, inhalation, and ingestion of intertidal sediment
- Ingestion of shellfish
- Dermal contact and ingestion of groundwater
- Inhalation of indoor air and air in excavation trenches

It should be noted that other than the testing operation at Building 35, the Navy-owned portion of Gould Island is not currently being used and the future land use is as an open space. There are no current or planned industrial or residential uses of the site. Due to the remote nature of the site, on an island, without active utilities, residential use is not feasible, though risk to future residents is assumed based on concentrations of contaminants measured in soil and groundwater.

### *How is Risk to People Expressed?*

In evaluating risks to humans, estimates for risk from carcinogens (chemicals that may cause cancer) and non-carcinogens (chemicals that may cause adverse effects other than cancer) are expressed differently.

For carcinogens, risk estimates are expressed in terms of probability. For example, exposure to a particular carcinogenic chemical may present a 1 in 10,000 increased chance of causing cancer over an estimated lifetime of 70 years. This can also be expressed as $1x10^{-4}$. The USEPA acceptable risk range for carcinogens is $1x10^{-6}$ (1 in 1,000,000) to $1x10^{-4}$ (1 in 10,000). In general, calculated risks higher than this range would require consideration of clean-up alternatives.

For non-carcinogens, exposures are first estimated and then compared to a reference dose (RfD). The RfD is developed by USEPA scientists to estimate the amount of a chemical a person (including the most sensitive person) could be exposed to over a lifetime without developing adverse health effects. The exposure dose is divided by the RfD to calculate the measure known as a hazard index (HI) (a ratio). A HI greater than 1 suggests that adverse effects may be possible.

Risk from exposure to lead is evaluated by using the slope-factor approach developed by the USEPA. The approach is based on effects to a fetus through exposure to the mother. For fetuses born to mothers exposed to lead, a probability that the fetal blood-lead concentration exceeds 10 micrograms per deciliter (µg/dL) is calculated. If the probability is less than 5 percent, it is accepted that lead does not pose a risk to humans.

***Step 3 - Toxicity Assessment.*** The possible harmful effects (toxicity) associated with potential human exposure to the COPCs were evaluated. These chemicals were separated into two groups: carcinogens (COPCs that may cause cancer) and non-carcinogens (COPCs that may cause adverse health effects other than cancer).

***Step 4 - Risk Characterization.*** In this final step, the results from the exposure and toxicity assessment were combined to estimate the overall risks from exposure to site COPCs. The HHRA did not specifically evaluate risks to residential receptors due to the location and planned future use of the property; however, unacceptable residential human health risk is assumed under a potential future exposure scenario, based on chemical concentrations present in groundwater (PCP and PCE that exceed maximum contaminant levels [MCLs]) and in soil.

The terms used to define the estimated risk are explained in the text box, *How is Risk to People Expressed?*

***Results -*** Potential unacceptable risks associated with the following exposure scenarios were identified:

- Exposure to shallow groundwater for future construction workers. Exposure routes include inhalation of air in a confined trench, ingestion, and dermal contact with standing water within excavations. PCBs, PAHs, and PCP are the main contaminants contributing to this risk.
- Exposure to intertidal sediment for future recreational visitors. The risk is associated with exposure to chromium, and assumes this metal is present in its most toxic form (which is not verified).
- Ingestion of shellfish by subsistence fishermen. PCBs, PAHs, arsenic, and thallium found within mussel and clams collected from the waters next to the site are the main contaminants contributing to this risk.
- Ingestion of shellfish by recreational fishermen. PCBs, PAHs, and arsenic are the main contaminants contributing to this risk.
- Exposure to soil and groundwater by any potential future resident is assumed to present unacceptable risk, though this risk was not quantified.

## Summary of the Human Health Risk Assessment

The findings of the HHRA are summarized in Table 1. This table presents the receptors to which there is possible risk of health effects: cancer effects are expressed as greater than $1x10^{-4}$; non-cancer effects are expressed as a Hazard Index of 1 or more. Refer also to the box to the left: *How is Risk to People Expressed?*

## Ecological Risks

The primary objective of the ERA was to evaluate whether or not ecological receptors (animals and plants) are potentially at risk when exposed to contaminants at Site 17. The ERA for Site 17 was completed to make sure that ecological receptors are able to exist and grow in ways similar to the surrounding area.

The ERA was conducted in two phases. The first phase, described as a screening-level ERA, included the following three steps:

***Step 1 - Problem Formulation.***

The problem formulation step identifies the contaminants present, and the ecological receptors (animal and plant life), potentially exposed to those contaminants. The ecological receptors evaluated for the ERA included:

- Benthic invertebrates (including shellfish)
- Aquatic biota (particularly fish)
- Piscivorous mammals and birds

Similar to the HHRA, COPCs were identified by comparing Site 17 chemical concentrations to risk-based screening levels. Detected chemicals that did not have screening values were also identified as COPCs. Based on sediment and tissue sampling results, SVOCs, PAHs, PCBs, pesticides, and metals were identified as COPCs and were further evaluated under Step 2 of the risk assessment process.

***Step 2 - Risk Analysis.*** The Navy evaluated the possible harmful effects to ecological receptors from potential exposure to the COPCs.

Exposure was determined by estimating or measuring the amount of a chemical in soil, groundwater, sediment, or plant or animal tissue, and estimating how much of these chemicals can be ingested or absorbed by the different ecological receptors. Some contaminants can be ingested and excreted without concern and others can have significant effects, depending on the receptors, their life cycles and habitats.

***Step 3 - Risk Characterization.*** The results from the risk analysis were used to determine the probability of adverse effects to the ecological receptors at the site. Based on the probability for the site contaminants to pose risk to ecological receptors, a second phase, or Baseline ERA (BERA) was recommended.

### *How is Ecological Risk Expressed?*

The risk to ecological receptors is expressed as a Hazard Quotient (HQ). HQs are calculated by dividing the exposure of the receptors to contaminants, through food or direct contact, with concentrations considered to pose little or no risk of adverse effects.

When the HQ is below 1, toxicological effects are unlikely to occur and no significant risk is present. When the HQ is above 1, there is a potential for significant risk to be present.

For the Site 17 ERA, more complex toxicity testing was conducted to determine site-specific effects from the mix of COCs at the site. After these effects were measured, a specific cleanup goal was established for the group of COCs present. This value is also expressed as a quotient, called an effects range-median quotient, or ERM-Q.

***Baseline Ecological Risk Assessment.*** The BERA was conducted in 2010 and 2011, and included detailed analysis of sediment and shellfish tissue as well as multiple toxicity tests to evaluate specific toxic effects to test organisms. The toxicity testing involves laboratory exposure of amphipods (shrimp-like crustaceans) to sediment samples from different areas of the site, and measurement of their survival and reproduction rates. The results are compared against similar results for sediment collected from unaffected areas of Narragansett Bay, and evaluated to identify which concentrations of each analyte show toxic effects to the different test organisms. The results were also compared with results from other similar studies to assure that concentrations that are finally identified as “toxic” and “non-toxic” to these test animals coincide with other scientific studies.

***Results -*** The results of the BERA indicate that there is unacceptable risk to benthic invertebrate organisms from PCBs in sediment, PAHs in sediment, and from the combined exposure to arsenic, cadmium, chromium, copper, lead, nickel, zinc, PAH, and PCBs in sediment.

A summary of the risk findings is presented in the graphic conceptual site model, which is presented as Figure 4 of this Proposed Plan.

## Cleanup Objectives

Based on the results of the risk assessments and comparisons to federal and state regulations, the following Chemicals of Concern (COCs) were identified for remediation at Site 17:

- Soil and Sump Debris – PAHs (particularly benzo(a)pyrene) and metals in soil. PAHs, metals and one PCB in debris within former building sumps.
- Groundwater – PCE (one location), PCP and naphthalene (one location), and manganese (site–wide).
- Sediment – PCBs, PAHs, metals were identified as likely sources of toxicity. The cleanup goal for PAHs in sediment was developed based on dose responses in toxicity tests. The cleanup goal for PCBs in sediment is based on human consumption of shellfish. (PCB cleanup goals were calculated based on dose responses in toxicity tests and based on human consumption of shellfish, and the lower of the two values was selected.) An additional cleanup goal was calculated for a combination of chemicals based on their individual benchmarks (Effects Range Median or ERM values) and observed toxicity. This calculated value is called an ERM quotient (ERM-Q).

Cleanup goals (also known as preliminary remediation goals, or PRGs) for the COCs in soil, sediment, and groundwater were developed in the FS, based on calculations of acceptable risk levels, regulatory criteria, and background concentrations. The cleanup goals for the major COCs at Site 17 are provided in Table 2 (soil) Table 3 (sediment) and Table 4 (groundwater). A detailed description of the development of these goals is provided in the FS.

Cleanup objectives (also known as Remedial Action Objectives [RAOs]) are the site-specific goals that a cleanup plan should achieve. The goals are designed to be protective of human health and the environment and to comply with applicable federal and state regulations. The cleanup objectives are developed to address all the COCs in soil and sump debris, groundwater, and sediment. The following cleanup objectives were identified for Site 17:

- Reduce risk to benthic invertebrates by preventing exposure to COCs in sediment that contribute to toxic effects in these organisms.
- Prevent exposure of recreational and subsistence fishermen to COCs in shellfish (mussels and clams) by reducing the exposure of those shellfish to the contaminants in sediment, until shellfish contamination no longer poses a human health risk.
- Prevent the incidental ingestion of and direct contact with surface and subsurface soil containing COCs that exceed human health PRGs.
- Prevent future migration of soil contaminants either to groundwater or adjacent sediments at concentrations that cause unacceptable risk.
- Restore groundwater quality to its beneficial use.
- Prevent residential exposure to Site groundwater until the groundwater cleanup goals have been achieved.
- Prevent construction worker exposure to COCs exceeding PRGs in trapped water in former building sumps, in contact with the sump debris and in test pits (“shallow groundwater”).

## Summary of Remedial Alternatives

Remedial alternatives (cleanup options) were developed and evaluated in the Site 17 FS for soil, groundwater and sediment to meet the RAOs listed above. These alternatives are briefly described below, with full details available for review in the FS which can be found in the public Information Repository described at the end of this Proposed Plan.

The following four cleanup options were evaluated for soil and sump debris at Site 17:

### *Soil and Sump Debris Alternative SO1 – No Action*

Under this option, the site would be left as it is today and no further cleanup or monitoring would be performed. Only administrative reviews of the site status would be conducted every 5 years, in accordance with CERCLA. Although the Navy has not considered this to be an appropriate response action for the site, it is a statutory requirement under CERCLA that a “no action” alternative be evaluated. Thus, this alternative is used as a baseline for comparison with other alternatives.

### *Soil and Sump Debris Alternative SO2 – Limited Excavation, Off-site Disposal, Land Use Controls and Inspections, and Monitoring*

This alternative would include excavation of surface soil that exceeds the PRGs based on industrial use of the site, excavation of soil exceeding leachability criteria and leaching COCs in the saturated zone, and establish and enforce land use controls (LUCs) to prevent residential and unrestricted recreational use of the site. This alternative would also include the removal and off-site disposal of debris from selected sumps and trenches within the foundation of the

former Building 32. Long-term monitoring will document that subsurface soil contaminants exceeding the cleanup goals do not migrate to groundwater or marine sediment. Post-excavation sampling will be conducted to ensure that cleanup goals are met. LUCs and site inspections would be implemented to ensure that the land use remains restricted to industrial uses, and that subsurface soils exceeding residential PRGs are not disturbed, but remain in place so that inadvertent contact with this environmental medium is prevented.

### *Soil and Sump Debris Alternative SO3 – Combination Excavation (and Off-site Disposal) and Solidification/Stabilization, LUCs and Inspections*

This alternative would include the removal and off-site disposal of debris from selected sumps and trenches within the foundation of the former Building 32, and on–site solidification of target area soils. Soil exceeding industrial PRGs would be addressed through a combination of stabilization (in-situ, or in place) and excavation, and off-site disposal. Some soil would be stabilized on site within the ground through addition of physical stabilizing agents, creating a solid mass that binds the contaminants within the matrix of the soil so they cannot come into contact with potential receptors. Some soil (both surface and subsurface) that contains naphthalene at concentrations above leachability criteria is not suitable for stabilization in place, and therefore, wherever possible, would be removed from the site through excavation and disposed of off-site in accordance with state and federal regulations. Long-term monitoring will document that subsurface soil contaminants exceeding the cleanup goals do not migrate to groundwater or marine sediment. Post-excavation sampling will be conducted in excavation areas to ensure that cleanup goals are met. LUCs and site inspections would be implemented to ensure that the land use remains restricted to industrial uses, similar to that required under Alternative SO2.

### *Soil and Sump Debris Alternative SO4 – Complete Excavation of Soils Exceeding Industrial PRGs (including Leachability Criteria), Off-site Disposal, LUCs and Inspections*

This alternative would include the removal and off-site disposal of debris from sumps and trenches within the foundation of the former Building 32. It would also include excavation and disposal of soil (surface and subsurface) exceeding PRGs based on industrial use of the site. Excavation at these target areas would also address naphthalene in groundwater at the one location where it is present above the groundwater PRG, presumed to be present due to leaching from soil at this one location. Finally, excavation at one additional target area will address naphthalene in subsurface soil that is above the RIDEM leachability criteria though impacts to groundwater do not appear to be occurring.

Although removal of soil is expected to reduce associated potential industrial risks, long-term monitoring will document that subsurface soil contaminants exceeding the cleanup goals do not migrate to groundwater or marine sediment. Post-excavation sampling will be conducted to ensure that cleanup goals are met. LUCs, inspections, and 5-year reviews would be implemented to ensure that the land use remains as industrial, thus protecting from potential future residential and /or unrestricted recreational use.

<u>The following three cleanup options were evaluated for site groundwater:</u>

### *Groundwater Alternative GW1 – No Action*

Under CERCLA, a “no action” alternative must be evaluated in order to serve as a baseline for comparison with the other alternatives. Under this option, the site would be left as it is today and no further cleanup or monitoring would be performed. Only administrative reviews of the site status would be conducted every 5 years, in accordance with CERCLA.

### *Groundwater Alternative GW2 – Monitored Natural Attenuation (MNA), LUCs and Inspections*

This alternative would include a long-term groundwater monitoring program to verify that natural attenuation processes are effectively reducing COC concentrations. Monitored Natural Attenuation (MNA), which is a USEPA-approved remedial option under certain circumstances, is a careful long-term examination of the site geochemistry, with a focus on the natural degradation (VOCs) and sequestration (metals) of contaminants. The MNA alternative includes LUCs and site inspections to prevent residential use of groundwater until PRGs are reached.

It is expected that the elevated concentrations of manganese are present as an indirect result of the biodegradation of organics (both natural and man-made). Releases of organic contaminants such as petroleum can alter an aquifer’s geochemistry, such that naturally-occurring metals in soil can become mobilized and migrate to groundwater. It is expected that as the biodegradation of the organic matter concludes and the aquifer geochemistry is restored to normal conditions, much of the dissolved manganese will come out of solution and become immobilized in its particulate form, with manganese concentrations in

groundwater returning to natural steady-state conditions.

It is also expected that the low concentrations of the three organics present in groundwater are flushing from the overburden aquifer, and will quickly be reduced to concentrations below the PRGs. A MNA alternative for groundwater would be augmented by the soil remedy S04 which would include excavation of soil exceeding leachability criteria for naphthalene by eliminating a possible source of this contaminant.

If it is determined that natural attenuation of manganese and organics is occurring at an acceptable rate, the Navy would continue the MNA program until the cleanup goals for the COCs in groundwater are achieved. LUCs would be implemented to protect humans from exposure to groundwater contaminants during the interim period until groundwater cleanup goals have been achieved. A time frame for this process to occur is estimated to be between 54 and 87 years based on limited data, but this estimate would need to be reviewed and refined at the five-year review periods at a minimum, to assure adequate progress is being made.

### *Groundwater Alternative GW3 – In Situ Treatment, MNA, Long-Term Monitoring, LUCs and Inspections*

Alternative GW3 would rely on in-situ treatment of the groundwater to reduce concentrations of manganese in groundwater. Monitoring and LUCs would also be required until the cleanup goals were achieved. It is expected that the low concentrations of organics present in groundwater are flushing from the overburden aquifer, and will be reduced to concentrations below the PRGs. For naphthalene, this alternative would be augmented by the soil remedy S04 which would include excavation of soil exceeding leachability criteria for this constituent by eliminating a possible source of this contaminant. As such, treatment of the groundwater would not be needed for these three organic COCs.

The treatment technology for manganese was developed based on the same understanding described for Alternative GW2: that the elevated concentrations of manganese present in the groundwater have been liberated from the soil/bedrock at the site as a result of biological degradation of organics present (both natural and man-made). As degradation in the subsurface occurs, changes in the subsurface chemical conditions are effected that cause metals, which are naturally present in soil and rock, to leach into and become dissolved in groundwater.

Differing from Alternative GW2, treatment of the groundwater would encourage and speed up the precipitation of manganese back into its solid form. Treatment would involve enhancing the growth of certain bacteria that are naturally present in the soil, thereby artificially creating geochemical conditions in the subsurface that are favorable to metals existing in their particulate state, rather than in their dissolved form. Treatment would, in theory, reverse the effect of the organics degrading at the site, and cause the manganese to undergo a reverse chemical reaction known as precipitation, changing manganese from its dissolved state back to a particulate state. Prior to its implementation, a small-scale testing of this treatment technology, called a pilot study, would be conducted to determine if the proper conditions exist at the site for this alternative to be viable. (If not, another treatment alternative for groundwater would be developed for approval by USEPA and RIDEM.)

This treatment process, known as bioprecipitation, would be conducted by installing a series of injection wells at the site and pumping a solution of sulfate-reducing bacteria and nutrients into the subsurface to enhance the bacterial growth. Careful monitoring of the injection process and groundwater conditions during this process is needed to verify that the groundwater conditions respond as expected.

A time frame for achieving groundwater cleanup goals is estimated to be four or more years, but this estimate would need to be reviewed and refined as part of the five-year reviews, at a minimum, to confirm adequate progress towards achieving the cleanup goal is being made.

Long-term groundwater monitoring would be conducted for the purpose of evaluating the effectiveness of the treatment process. LUCs, including site inspections, would be implemented to prevent exposure to COCs in groundwater and protect human health during the interim period until PRGs have been achieved in groundwater.

<u>The following three cleanup options were evaluated for marine sediment (SD):</u>

### *Sediment Alternative SD1 – No Action*

Under CERCLA, a “no action” alternative must be evaluated in order to serve as a baseline for comparison with the other alternatives. Under this option, the site would be left as it is today and no further cleanup or monitoring would be performed. Only administrative reviews of the site status would be conducted every 5 years, in accordance with CERCLA.

***Sediment Alternative SD2 – Subaqueous Cover, LUCs and Monitoring (Stillwater Area), Limited Monitoring (Northeast Shoreline)***

This alternative would consist of a cover system (subaqueous cap) to prevent continued exposure to the contaminated sediment in the Stillwater Area. LUCs would be implemented to control any activity that could disturb the integrity of the subaqueous cover (dredging, cabling, anchoring, or intrusive construction). A long-term monitoring program would be implemented to monitor annually for changes in the condition of the cover area, including monitoring the thickness of the cover system. In addition, limited monitoring (two additional events) would be conducted at four specific areas along the Northeast Shoreline, where samples collected in 2005 indicated COCs present at concentrations exceeding PRGs, but where COCs did not exceed PRGs in 2010 resampling at or near three of the four locations.

***Sediment Alternative SD3 – Sediment Removal and Off-site Disposal (Stillwater Area), Limited Monitoring (Northeast Shoreline)***

This alternative would involve the removal and off-site disposal of contaminated sediments in the Stillwater Area. Post-dredging sampling would be conducted to ensure that cleanup goals have been met within the dredge area, using an approach that provides statistical assurance that cleanup goals are met, and accommodates variability and heterogeneity inherent with sediment chemical data. In addition, limited monitoring (two additional events) would be conducted at four specific areas along the Northeast Shoreline, where samples collected in 2005 indicated COCs present at concentrations exceeding PRGs, but where COCs did not exceed PRGs in 2010 resampling at or near three of the four locations.

## Common Elements

With the exception of the No Action alternatives, each of the cleanup options also includes the following common elements as part of the overall site remedy:

- LUCs - The Navy will implement LUCs to restrict any uses of the site that would pose unacceptable risk to human health. If the property were ever to be transferred out of federal ownership, then the LUCs would be recorded as deed restrictions meeting state property law standards.
- Inspections - As a part of the LUCs, periodic inspections would be conducted to assure that the LUCs are maintained, that signs are posted warning trespassers of potential hazards, and that other elements of the controls are still present.
- 5-Year Reviews – In accordance with CERCLA, a detailed review of site conditions would be conducted every 5 years in coordination with federal and state regulatory agencies for as long as COCs remain at concentrations that do not allow for unrestricted use and unlimited exposure.

## Evaluation of Alternatives

USEPA has established nine criteria for use in comparing the advantages/disadvantages of each cleanup alternative. These criteria fall into three groups: (1) “threshold criteria” that any selected alternative must meet; (2) “primary balancing criteria” that are used to differentiate between alternatives; and (3) “modifying criteria” that may be used to modify the recommended remedy.

In the FS, each alternative identified above was individually analyzed with respect to the criteria. Next, the alternatives were compared to each other with respect to each criterion. Tables 5, 6, and 7 at the end of this Proposed Plan provide a summary of the alternatives for soil, sediment, and groundwater.

## Preferred Action Alternatives

The Navy is proposing a combination of Soil Alternative SO4, Groundwater Alternative GW2, and Sediment Alternative SD3 for the whole-site remedial action. This combination is recommended because it offers the best balance among the nine evaluation criteria (shown on Tables 5, 6, and 7).

The preferred Soil Alternative SO4 includes the removal and off-site disposal of sump debris from selected sumps and trenches within the foundation of the former Building 32 and removal of all soil from areas where industrial PRGs are exceeded in the vadose zone. This is the preferred alternative because it will remove contaminants which exceed industrial PRGs, provide adequate protection for the current use (open space) and leave the site unencumbered for industrial purposes if such uses are deemed necessary. LUCs will remain to prevent residential and unrestricted recreational use, supported by inspections and long-term monitoring, though these are not anticipated uses for this site.

The preferred Groundwater Alternative GW2 relies on MNA, which includes a long-term groundwater monitoring and evaluation program to verify that natural attenuation processes are effectively reducing VOCs and reducing manganese concentrations to the natural steady-state conditions. This is the preferred alternative because there is no current receptor that could be affected by the groundwater COCs present,

because there is no plan for future use of the groundwater, and the no action alternative does not meet the threshold criteria.

The five-year review will assess if adequate reductions in concentrations of COCs are evident in the monitoring data. After an appropriate amount of data has been collected to allow a determination, if MNA is determined to be an ineffective remedy for the Site, the Navy will seek a change to the remedial action with approval by USEPA and RIDEM, in accordance with CERCLA and the FFA, using an additional public notification and ROD revision, or Explanation of Significant Differences, as appropriate. If reductions in manganese and VOC concentrations in groundwater are adequate, the Navy would continue the MNA program until cleanup goals in groundwater are achieved. In the meantime, implementing LUCs will ensure continued protection of human health by preventing the use of groundwater until cleanup goals are achieved and ensure the components of the remedy (monitoring wells) are not disturbed.

The preferred sediment alternative SD3 includes sediment removal from an area that is open for shell-fishing and may be needed for ship traffic in the future. This is the preferred alternative because it will permanently remove sediment contamination from the site, leaving the commercial and natural resources of this portion of Narragansett Bay unencumbered.

In accordance with the Clean Water Act, the Navy has determined that Alternative SD3 is the "Least Environmentally Damaging Practicable Alternative" (LEDPA) that provides the best balance of addressing contaminated media at the site while minimizing both temporary and permanent alteration of wetlands/aquatic habitats on site.

Section 404 of the Clean Water Act and Executive Orders 11990 (Protection of Wetlands) and 11988 (Protection of Floodplains), as incorporated under Federal Emergency Management Agency (FEMA) regulations that are relevant and appropriate to the cleanup, require a determination that there is no practical alternative to taking federal actions affecting federal jurisdictional wetlands/aquatic habitats and floodplains.

The USEPA and the Navy are requesting public comment concerning the finding that the proposed cleanup alternative for sediments is the least environmentally damaging practicable approach for protecting coastal habitats. The USEPA and the Navy are also proposing a finding under TSCA, that the risk-based PCB cleanup level for sediments will not pose an unreasonable risk or injury to health or the environment, and the removal and disposal of PCB-contaminated sediments will address both human health and ecological risk. The proposed remedy for soil (SO4) is also protective under TSCA standards, as soils with PCBs exceeding risk-based standards would be removed for disposal off site.

Based on information currently available, the Navy believes the Preferred Alternatives meet the threshold criteria and provide the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The Navy expects the Preferred Alternatives to satisfy the following statutory requirements of CERCLA §121(b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) provide long-term effectiveness; 4) be cost-effective; and 5) satisfy the preference for treatment as a principal element to the extent practicable.

## Next Steps

Community consideration of this Proposed Plan is the next step in the cleanup process for Site 17. The public is encouraged to review this plan and submit comments to the Navy.

**The Navy will accept written comments on the Proposed Plan during the public comment period, from Thursday March 13, 2014 to Saturday, April 12, 2014. The Navy will accept oral comments during a Public Hearing that follows a Public Information Session to be held on Wednesday March 19, 2014 at the Courtyard Marriott Hotel, 9 Commerce Drive, in Middletown, Rhode Island.**

You do not have to be a technical expert to take part in the process. The Navy would like to know your thoughts before making a final decision on whether or not to implement the proposed remedy for Site 17.

Once the community has commented on this Proposed Plan, the Navy, USEPA, and RIDEM will consider all comments received. It is possible that this Proposed Plan could change as a result of comments received from the community. The Navy will provide written responses to all comments received on the Proposed Plan. The responses to public comments will be provided in a document called a Responsiveness Summary, which will be submitted with the ROD prepared for Site 17.

The ROD will contain the rationale for the Navy's and USEPA's decision for Site 17. The Navy and USEPA anticipate that all comments will be reviewed and the ROD will be signed by May 2014. The ROD will then be made available to the public via the public

Information Repository described at the end of this Proposed Plan. The Navy will announce the availability of the ROD through local newspapers and to the NAVSTA Newport RAB.

## After the Record of Decision

After the ROD is signed, the Navy will design and implement the selected alternatives. The available data and information will be used to prepare an engineering design of the selected actions. The Navy will be conducting additional investigations in support of the Remedial Design.

After the design is completed, and assuming there is no major opposition to the proposed action, the Navy will oversee the construction, MNA, and LUC activities to ensure that the actions are properly implemented. Long-term monitoring and 5-year reviews will be conducted to ensure that the remedies remain protective over time.

## Your Comments Are Important!

Public comments are used to improve the decision-making process. The Navy will hold a 30-day comment period for receiving written comments as well as hold a Public Hearing for receiving oral comments. All comments, whether oral or written, received during the public comment period and Public Hearing will become part of the official public record. The Navy will respond to all these comments in writing. See Page 1 of this Proposed Plan for information on how to submit a comment to the Navy.

All public comments and the Navy's responses will be issued in a document called a Responsiveness Summary that will accompany the Record of Decision (cleanup plan) for Site 17. Copies of the Responsiveness Summary will be mailed or emailed to everyone who gave comment(s). The Navy will consider all comments in making the final decision for the site. The Navy will announce the final decision through the local newspapers.

The public is encouraged to participate during this period as your thoughts and opinions will help in making the final decision. You do not have to be a technical expert to take part in the process.

## Commitment to the Communities

The Navy is committed to keeping the communities informed on the environmental cleanup program at NAVSTA Newport. The RAB, composed of the community and government agency representatives, meets regularly to discuss the environmental cleanup program at NAVSTA Newport. At these meetings, community members can provide input and offer suggestions on program activities. Upcoming RAB meetings are publicized in the local news media and are open to the public. If you would like further information about the RAB or the environmental restoration program at NAVSTA Newport, please contact the Navy Public Affairs Office at the address provided on Page 1 of this Proposed Plan. If you would like further information about the specific investigations conducted at Site 17, please contact Ms. Lisa Rama at the phone number listed at the end of this Proposed Plan.

## For More Information

This Proposed Plan summarizes information that can be found in greater detail in the RI and FS for Site 17. These and other site documents, which form the Administrative Record for this Proposed Plan, are available online at http://www.rabnewportri.org (click on the link for the NAVFAC Website). The public is invited to review these documents and comment on this Proposed Plan during the public comment period. A copy of the ROD which selects the final remedy and includes the Responsiveness Summary will also be made available on the website.

## Important Dates

30-Day Public Comment Period:
**Thursday, March 13, 2014 to Saturday, April 12, 2014**

Public Meeting:
**Wednesday, March 19, 2014**
**(7:00 p.m. to 8:00 p.m.)**

Public Hearing:
**Wednesday, March 19, 2014**
**(8:00 p.m.)**

| TABLE 1. RECEPTORS AND CALCULATED RISK (RME) | | | |
|---|---|---|---|
| **RECEPTOR** | **MEDIUM** | **TOTAL CANCER RISK** | **TOTAL NON-CANCER RISK (HAZARD INDEX)** |
| Construction Worker | Shallow Groundwater (from test pits) | $2x10^{-3}$ | 1 |
| | Trench Air (modeled from shallow groundwater) | $4x10^{-4}$ | 561 |
| | All Soil – 0 to 10 feet | $< 1x10^{-4}$ | 1 |
| | Subsurface Soil Dust | $< 1x10^{-4}$ | < 1 |
| Recreational Visitor - Child | Intertidal Sediment | $< 1x10^{-4}$ | 2[(1)] |
| | Surface Soil – 0 to 2 feet | $< 1x10^{-4}$ | < 1 |
| Recreational Visitor - Adult | Intertidal Sediment | $< 1x10^{-4}$ | < 1 |
| | Surface Soil – 0 to 2 feet | $< 1x10^{-4}$ | < 1 |
| Trespasser - Adolescent | Intertidal Sediment | $< 1x10^{-4}$ | < 1 |
| | Surface Soil – 0 to 2 feet | $< 1x10^{-4}$ | < 1 |
| Industrial Worker | Surface Soil – 0 to 2 feet | $< 1x10^{-4}$ | < 1 |
| | All Soil – 0 to 10 feet | $< 1x10^{-4}$ | 1 |
| | Subsurface Soil Dust | $< 1x10^{-4}$ | < 1 |
| Shellfish Ingestion - Child[(2)] | Mussels | $5x10^{-4}$ | 34 |
| | Clams | $5x10^{-4}$ | 18 |
| Shellfish Ingestion - Adult[(2)] | Mussels | $1x10^{-3}$ | 23 |
| | Clams | $1x10^{-3}$ | 13 |

[(1)]Risk identified is associated with exposure to chromium, and assumes this metal is present in its most toxic form, which is not likely in marine environments.
[(2)]Risks cited for shellfish ingestion are based on subsistence level consumption.
Yellow background indicates exceedance of risk threshold.

| TABLE 2 - CLEANUP GOALS FOR SOIL | | | |
|---|---|---|---|
| **Chemical of Concern** | **Selected Cleanup Goal (mg/kg)** | | **Basis of the Cleanup Goal** |
| | **Potential Future Residential Use** | **Future Industrial Use** | |
| Benzo(a)anthracene | 0.9 | 7.8 | RIDEM Direct Exposure Criteria[(1)] |
| Benzo(a)pyrene | 0.4 | 0.8 | RIDEM Direct Exposure Criteria[(1)] |
| Benzo(b)fluoranthene | 0.9 | 7.8 | RIDEM Direct Exposure Criteria[(1)] |
| Benzo(g,h,i)perylene | 0.8 | - NS - | RIDEM Direct Exposure Criteria[(1)] |
| Benzo(k)fluoranthene | 0.9 | - NS - | RIDEM Direct Exposure Criteria[(1)] |
| Chrysene | 0.4 | - NS - | RIDEM Direct Exposure Criteria[(1)] |
| Dibenzo(a,h)anthracene | 0.4 | 0.8 | RIDEM Direct Exposure Criteria[(1)] |
| Indeno(1,2,3-cd)pyrene | 0.9 | - NS - | RIDEM Direct Exposure Criteria[(1)] |
| Naphthalene | 0.8 | 0.8 | RIDEM Leachability Criteria |
| Pyrene | 13 | - NS - | RIDEM Direct Exposure Criteria[(1)] |
| Aroclor, Total (PCBs) | 1 | - NS - | EPA Residential Criterion (RSL)[(2)] |
| Arsenic | 7.99 | 7.99 | Background |
| Cadmium | 39 | 1000 | RIDEM Direct Exposure Criteria[(1)] |
| Lead | 150 | 500 | RIDEM Direct Exposure Criteria[(1)] |
| Manganese | 390 | - NS - | RIDEM Direct Exposure Criteria[(1)] |

1 - RIDEM Direct Exposure Criteria for both residential and industrial exposures are cited, if available.
2 - USEPA Residential Criterion is based on the Regional Screening Level (RSL) for residential use.
mg/kg - milligram per kilogram
NS - Not selected: An industrial cleanup goal was not selected because the maximum concentration found does not exceed the applicable standards.

| TABLE 3 – CLEANUP GOALS FOR SEDIMENT | | | |
|---|---|---|---|
| **Chemical of Concern** | **Units** | **Selected Cleanup Goal** | **Basis of the Cleanup Goal** |
| Chromium | mg/kg | 855,500[(1)] | Human Health Exposure in Shoreline Sediment |
| Total PAHs | µg/kg | 46,178 | Ecological Effects |
| Total PCBs [(2)] | µg/kg | 1,500 | Human Health Exposure to Contaminants in Shellfish |
| Mean ERM-Q [(3)] | --- | 1.42 | Ecological Effects |

1 - A cleanup goal of 855,500 mg/kg is established for $Cr^{+3}$, which is the likely chromium valence state at the Site.

2 - PCBs - polychlorinated biphenyls, measured as homologues

3 - ERM-Q - Effects Range-Median Quotient, contributed by PAHs, PCBs, arsenic, cadmium, chromium, copper, lead, nickel, and zinc

| TABLE 4 – CLEANUP GOALS FOR GROUNDWATER AND WATER TRAPPED IN SUMPS AND TEST PITS | | |
|---|---|---|
| **Chemical of Concern** | **Selected Cleanup Goal (µg/L)** | **Basis of the Cleanup Goal** |
| 2-Methylnaphthalene | 350 | Risk-based Criteria [(1)] |
| Benzo(a)anthracene | 380 | Risk-based Criteria [(1)] |
| Benzo(a)pyrene | 0.2 | Drinking Water Criteria [(2)] |
| Benzo(b)fluoranthene | 380 | Risk-based Criteria [(1)] |
| Chrysene | 37,700 | Risk-based Criteria [(1)] |
| Dibenzo(a,h)anthracene | 38 | Risk-based Criteria [(1)] |
| Fluoranthene | 157,200 | Risk-based Criteria [(1)] |
| Indeno(1,2,3-cd)pyrene | 375 | Risk-based Criteria [(1)] |
| Phenanthrene | 118,000 | Risk-based Criteria [(1)] |
| Benzene | 5 | Drinking Water Criteria [(2)] |
| Naphthalene | 100 | Drinking Water Criteria [(2)] |
| Pentachlorophenol | 1 | Drinking Water Criteria [(2)] |
| Tetrachloroethene | 5 | Drinking Water Criteria [(2)] |
| Trichloroethene | 5 | Drinking Water Criteria [(2)] |
| Total Aroclors | 0.5 | Drinking Water Criteria [(2)] |
| Arsenic | 10 | Drinking Water Criteria [(2)] |
| Manganese | 300 | EPA Health Advisory [(3)] |

1 - Risk-based criteria developed for construction worker's contact with/incidental ingestion of water from test pits.
2 - Drinking water criteria were used where available: the current USEPA MCL or RIDEM GA groundwater objective was selected as the cleanup goal to provide the basis for the LUC preventing residential use of groundwater.
3 - USEPA has requested that their Drinking Water Health Advisory (lifetime) guidance value be used for manganese.

µg/L - microgram per liter

## TABLE 5 - COMPARISON OF SOIL AND SUMP DEBRIS CLEANUP ALTERNATIVES

| Criteria | Alternative SO1 | Alternative SO2 | Alternative SO3 | Alternative SO4 |
|---|---|---|---|---|
| ***ALTERNATIVE DESCRIPTION/COMPONENTS*** | | | | |
| Evaluation Criteria | No Action | Limited Excavation, Off-site Disposal, LUCs, and Monitoring | Combination Excavation (and Off-site Disposal) and Solidification/Stabilization, and LUCs | Complete Excavation, Off-site Disposal, and LUCs |
| ***ESTIMATED TIMEFRAMES FOR CLEANUP (YEARS)*** | | | | |
| Time to achieve cleanup goals | Not Applicable | 1 Year | 1 Year | 1 Year |
| ***CRITERIA ANALYSIS:* Threshold Criteria – Selected alternative must meet these criteria** | | | | |
| Protects Human Health and the Environment – *Will it protect people and animal life? Is it permanent?* | ⊘ | ● | ● | ● |
| Compliance with ARARs – *Does this alternative meet federal and state environmental laws, regulations, and requirements?* | ⊘ | ● | ● | ● |
| **Primary Balancing Criteria – Used to differentiate between alternatives meeting threshold criteria** | | | | |
| Provides Long-Term Effectiveness and Permanence – *Do risks remain onsite? If so, are the controls adequate and reliable?* | ⊘ | ○ | ○ | ● |
| Reduces Mobility, Toxicity, and Volume Through Treatment – *Does the alternative reduce the harmful effects of the contaminants, their ability to spread, and the amount of contaminated material present?* | ⊘ | ⊘ | ○ | ⊘ |
| Provides Short-Term Protection – *How soon will risks be reduced? Are there short-term hazards to workers, residents, or the environment that could occur during cleanup?* | ⊘ | ● | ● | ● |
| Implementability – *Is the alternative technically feasible? Are necessary goods and services (treatment equipment, space, etc.) available?* | ● | ● | ● | ● |
| Costs (see Notes a and b below)<br>*Capital Costs (initial costs)*<br>*O&M Costs (total long-term, 30-year)*<br>*Total Present Worth Cost (total cost in today's dollars)* | $0 | $1,374,649 | $1,029,277 | $1,256,890 |
| **Modifying Criteria – May be used to modify recommended cleanup** | | | | |
| State Agency Acceptance – *Do state environmental agencies agree with Navy's recommended alternative?* | To be determined following the public comment period. | | | |
| Community Acceptance – *What objections, modifications, or suggestions does the public offer during the public comment period?* | To be determined following the public comment period. | | | |

Notes:

a) For purposes of cost estimation, all O&M costs represent 30-year timeframes, only. Actual total costs may be higher.

b) The No Action Alternative costs include conducting 5-year reviews.

ARARs: Applicable or relevant and appropriate requirements
LUCs: Land Use Controls
MNA: Monitored Natural Attenuation
O&M: Operation and Maintenance

● Meets
○ Partially Meets
⊘ Does Not Meet

## TABLE 6 - COMPARISON OF GROUNDWATER CLEANUP ALTERNATIVES

| Criteria | Alternative GW1 | Alternative GW2 | Alternative GW3 |
|---|---|---|---|
| ***ALTERNATIVE DESCRIPTION/COMPONENTS*** | | | |
| Evaluation Criteria | No Action | MNA and LUCs | In-Situ Treatment, MNA, Monitoring, and LUCs |
| ***ESTIMATED TIMEFRAMES FOR CLEANUP (YEARS)*** | | | |
| Time to achieve cleanup goals | Not Applicable | 54 – 87 years | 5 - 10 years |
| ***CRITERIA ANALYSIS:* Threshold Criteria – Selected alternative must meet these criteria** | | | |
| Protects Human Health and the Environment – *Will it protect people and animal life? Is it permanent?* | ⊘ | ● | ● |
| Compliance with ARARs – *Does this alternative meet federal and state environmental laws, regulations, and requirements?* | ⊘ | ● | ● |
| **Primary Balancing Criteria – Used to differentiate between alternatives meeting threshold criteria** | | | |
| Provides Long-Term Effectiveness and Permanence – *Do risks remain onsite? If so, are the controls adequate and reliable?* | ⊘ | ○ | ○ |
| Reduces Mobility, Toxicity, and Volume Through Treatment – *Does the alternative reduce the harmful effects of the contaminants, their ability to spread, and the amount of contaminated material present?* | ⊘ | ⊘ | ● |
| Provides Short-Term Protection – *How soon will risks be reduced? Are there short-term hazards to workers, residents, or the environment that could occur during cleanup?* | ⊘ | ○ | ○ |
| Implementability – *Is the alternative technically feasible? Are necessary goods and services (treatment equipment, space, etc.) available?* | ● | ● | ○ |
| Costs (see Notes a and b below)<br>*Capital Costs (initial costs)*<br>*O&M Costs (total long-term, 30-year)*<br>*Total Present Worth Cost (total cost in today's dollars)* | $0 | $1,718,405 | $2,911,706 |
| **Modifying Criteria – May be used to modify recommended cleanup** | | | |
| State Agency Acceptance – *Do state environmental agencies agree with Navy's recommended alternative?* | To be determined following the public comment period. | | |
| Community Acceptance – *What objections, modifications, or suggestions does the public offer during the public comment period?* | To be determined following the public comment period. | | |

Notes:

a) For purposes of cost estimation, all O&M costs represent 30-year timeframes, only. Actual total costs may be higher.

b) The No Action Alternative costs include conducting 5-year reviews.

ARARs: Applicable or relevant and appropriate requirements
LUCs: Land Use Controls
O&M: Operation and Maintenance

● Meets
○ Partially Meets
⊘ Does Not Meet

| TABLE 7 - COMPARISON OF SEDIMENT CLEANUP ALTERNATIVES | | | |
|---|---|---|---|
| **Criteria** | **Alternative SD1** | **Alternative SD2** | **Alternative SD3** |
| ***ALTERNATIVE DESCRIPTION/COMPONENTS*** | | | |
| Evaluation Criteria | No Action | Subaqueous Cover, LUCs and Monitoring (Stillwater Area), Limited Monitoring (Northeast Shoreline) | Sediment Removal and Off-site Disposal (Stillwater Area), Limited Monitoring (Northeast Shoreline) |
| ***ESTIMATED TIMEFRAMES FOR CLEANUP (MONTHS)*** | | | |
| Time to achieve cleanup goals | Not Applicable | 1 year | 2 years |
| ***CRITERIA ANALYSIS:* Threshold Criteria – Selected alternative must meet these criteria** | | | |
| Protects Human Health and the Environment – *Will it protect people and animal life? Is it permanent?* | ⊘ | ● | ● |
| Compliance with ARARs – *Does this alternative meet federal and state environmental laws, regulations, and requirements?* | ⊘ | ● | ● |
| **Primary Balancing Criteria – Used to differentiate between alternatives meeting threshold criteria** | | | |
| Provides Long-Term Effectiveness and Permanence – *Do risks remain onsite? If so, are the controls adequate and reliable?* | ⊘ | ○ | ● |
| Reduces Mobility, Toxicity, and Volume Through Treatment – *Does the alternative reduce the harmful effects of the contaminants, their ability to spread, and the amount of contaminated material present?* | ⊘ | ⊘ | ⊘ |
| Provides Short-Term Protection – *How soon will risks be reduced? Are there short-term hazards to workers, residents, or the environment that could occur during cleanup?* | ⊘ | ○ | ○ |
| Implementability – *Is the alternative technically feasible? Are necessary goods and services (treatment equipment, space, etc.) available?* | ● | ● | ● |
| Costs (see Notes a and b below)<br>*Capital Costs (initial costs)*<br>*O&M Costs (total long-term, 30-year)*<br>*Total Present Worth Cost (total cost in today's dollars)* | $0 | $4,755,519 | $12,033,208 |
| **Modifying Criteria – May be used to modify recommended cleanup** | | | |
| State Agency Acceptance – *Do state environmental agencies agree with Navy's recommended alternative?* | To be determined following the public comment period. | | |
| Community Acceptance – *What objections, modifications, or suggestions does the public offer during the public comment period?* | To be determined following the public comment period. | | |

Notes:

c) For purposes of cost estimation, all O&M costs represent 30-year timeframes, only. Actual total costs may be higher.

d) The No Action Alternative costs include conducting 5-year reviews.

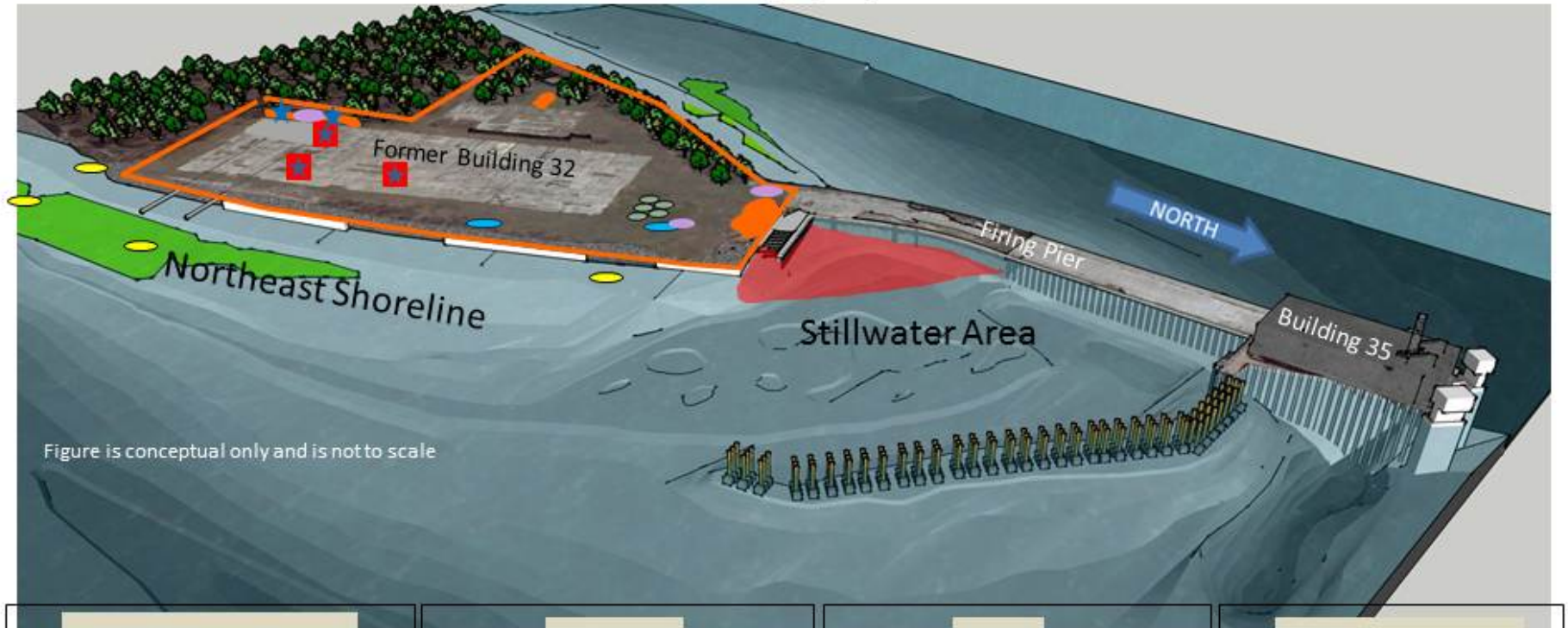
ARARs: Applicable or relevant and appropriate requirements
LUCs: Land Use Controls
O&M: Operation and Maintenance

● Meets
○ Partially Meets
⊘ Does Not Meet

FIGURE 4

## Summary Conceptual Site Model

Site 17 - Former Building 32, Gould Island
NAVSTA Newport, Newport RI




### Sediment

Sediment exceeding PRGs
- Contaminants – PCBs and PAHs
- Risk - Ecological and Human (shellfishing)
- Action – Dredge and dispose

Sediment which exceeded PRGs in 2005, but not in 2010
- Contaminants – lead, cadmium, PCBs
- Risk – ecological receptors
- Action – Limited Monitoring

Sub-tidal eelgrass, protected habitat

### Debris

Sump Debris and associated water
- Contaminants – PCBs, SVOCs, Metals
- Risk – Construction worker / trench – air
- Action: excavate and dispose

Test Pit Water exceeding PRGs
- Contaminants – PAHs
- Risk – Construction worker exposure
- Action: Remove and dispose

### Soil

Soil exceeding Industrial PRGs
- Contaminants – PCBs, PAHs, metals
- Risk – Construction worker
- Action – Excavate, dispose

Soil exceeding residential PRGs
- Contaminants – PAHs and cadmium
- Risk – Presumed risk to residents (concentrations > RDECs)
- Action – Land use controls, inspections

Soils exceeding Leachability Criteria
- Risk - potential effect to groundwater
- Action – Excavate, dispose

### Groundwater

Groundwater exceeding MCLs
- Contaminants – PCP, PCE,
- Assumed risk from ingestion of groundwater.
- Action – MNA, Land Use Controls

Groundwater exceeding health advisory for manganese.
- Assumed risk from ingestion of groundwater (same boundary as for soil > residential PRGs).
- Action – MNA, Land Use Controls

# COMMENT SHEET –
# Proposed Plan for Site 17, Former Building 32, Gould Island

## Use this space to write your comments or to be added to the mailing list.

The Navy encourages your written comments on the Proposed Plan for Site 17 (Former Building 32, Gould Island) at the Naval Station (NAVSTA) Newport, Newport, Rhode Island. You can use the form below to send written comments. If you have questions about how to comment, please contact the Navy's Public Affairs Office (Ms. Lisa Rama) at (401) 841-3538. This form is provided for your convenience.

Please fax or mail this form, or additional sheets of written comments, postmarked no later than Saturday, April 12, 2014 to the address shown below:

Ms. Lisa Rama
Public Affairs Office
690 Peary Street
Naval Station Newport
Newport, RI 02841
Fax: (401) 841-2265

Comment Submitted by:

Address:

_____

_____

_____

Affix
Postage

**Ms. Lisa Rama**
**Public Affairs Office**
**690 Peary Street**
**Naval Station Newport**
**Newport, RI 02841**

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(Fold on dotted line, staple, stamp, and mail)

# GLOSSARY OF TERMS

**Administrative Record:** The collection of documents supporting the decision for the proposed cleanup alternative. A copy of the Administrative Record is available for public review at the local Information Repository.

**Applicable or Relevant and Appropriate Requirements (ARARs):** Federal environmental and state environmental and facility siting statutes and regulations that must be complied with for each alternative. The ARARs vary depending on the alternative being proposed.

**Chemicals of Concern:** Chemicals identified in risk assessments as the primary drivers of unacceptable risks.

**Chemicals of Potential Concern:** Chemicals which are found at concentrations above federal and state risk-screening levels and, therefore, are included in further risk assessments.

**Chlorinated Solvent:** An organic compound that is frequently used for degreasing or dry cleaning. Examples of chlorinated solvents include trichloroethene (TCE) and tetrachloroethene (PCE).

**Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):** A federal law passed in 1980 and amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA). These laws created a system and funding mechanism for investigating and cleaning up abandoned and/or uncontrolled hazardous waste sites. The Navy's cleanup of sites regulated by CERCLA/SARA is funded by the Department of Defense under the Defense Environmental Restoration Fund.

**Feasibility Study:** A description and engineering study of the potential cleanup alternatives for a site.

**Groundwater:** Groundwater is the water found beneath the earth's surface that fills pores and cracks between such materials as sand, soil, gravel, or rock.

**Information Repository:** A public file containing site information, documents of onsite activities, and general information about a site.

**Land Use Control:** A legal or administrative restriction that prevents access or certain uses of land.

**Monitoring Wells:** A monitoring well is drilled at a specific location on or off a waste site. Groundwater can be sampled at selected depths and studied to determine the direction of groundwater flow and the types and quantities of chemicals present in groundwater.

**Proposed Plan:** A CERCLA document that summarizes the preferred cleanup remedy for a site and provides the public with information on how they can participate in the remedy selection process.

**Polycyclic Aromatic Hydrocarbons (PAHs):** PAHs are complex organic molecules that are commonly found in fuel, soot and in petroleum based solvents such as naphtha and creosote.

**Record of Decision:** A CERCLA legal, technical, and public document that explains the rationale and final cleanup decision for a site. It contains a summary of the public's involvement in the cleanup decision.

**Remedial Action Objectives:** Goals that are set to protect human health and the environment, and provide the basis to select cleanup methods.

**Remedial Investigation:** A step in the CERCLA process that is completed to gather sufficient information to support selection of a cleanup approach to a site. The Remedial Investigation involves site characterization or the collection of data and information necessary to characterize the nature and extent of contamination at a site. The Remedial Investigation also determines whether or not the contamination presents a significant risk to human health or the environment.

**Responsiveness Summary:** A document containing the responses to the public comments on the Proposed Plan. This summary is issued as part of the Record of Decision.

**Restoration Advisory Board:** A forum for the exchange of information and partnership among citizens, community representatives, the Navy, and regulatory agencies for the environmental cleanup programs at NAVSTA Newport.

**Volatile Organic Compound:** An organic chemical that easily forms vapors under normal temperatures and pressures.

**TETRA TECH, INC.**
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Wilmington, MA 01887

## For More Information…

### Contacts

If you have general questions about the restoration program at NAVSTA Newport, please contact:

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### Information Repository

Documents in the Administrative Record relating to environmental cleanup activities for the NAVSTA Newport property are available for public review at the following Information Repository:

Visit our Website at:
http://go.usa.gov/DyNw

or

http://www.rabnewportri.org/
and click on the link for the "NAVFAC Website"