

EXPLANATION OF SIGNIFICANT DIFFERENCES  
TO THE  
RECORD OF DECISION

OPERABLE UNIT 25  
AREA OF CONCERN HANGAR 1  
MAIN HANGAR FLOOR DRAINS

FORMER NAVAL AIR STATION SOUTH WEYMOUTH  
WEYMOUTH, MASSACHUSETTS

December 2011

**STATEMENT OF PURPOSE AND AUTHORIZING SIGNATURES**

This decision document explains the basis for the determination to issue the attached Explanation of Significant Differences (ESD) for Area of Concern Hangar 1 Main Hangar Floor Drains (AOC Hangar 1) at the former Naval Air Station (NAS) South Weymouth, Massachusetts.

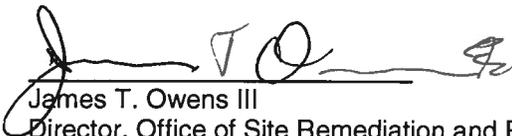
For the reasons documented herein, by my signature below, I approve the issuance of this ESD for Operable Unit 25, AOC Hangar 1 at the NAS South Weymouth Superfund Site and the changes stated therein. Concur and recommended for immediate implementation:

U.S. Department of the Navy

By:   
David A. Barney  
NAVFAC BRAC Environmental Coordinator  
Former Naval Air Station South Weymouth  
U.S. Navy

Date: 12/13/11

Concur and recommended for immediate implementation:

By:   
James T. Owens III  
Director, Office of Site Remediation and Restoration  
U.S. Environmental Protection Agency, Region I

Date: 12/13/07

**EXPLANATION OF SIGNIFICANT DIFFERENCES  
OPERABLE UNIT 25 – AOC HANGAR 1  
FORMER NAVAL AIR STATION SOUTH WEYMOUTH, MASSACHUSETTS**

**1.0 INTRODUCTION TO THE SITE AND STATEMENT OF PURPOSE**

**1.1 Site Name and Location**

Naval Air Station South Weymouth  
1134 Main Street  
Weymouth, Massachusetts 02190  
MA2170022022  
Operable Unit 25 – AOC Hangar 1

**1.2 Identification of Lead and Support Agencies**

The U.S. Navy is the lead agency for all environmental investigations and cleanup programs at former Naval Air Station (NAS) South Weymouth. The lead regulatory agency is the U.S. Environmental Protection Agency Region 1 (EPA). The Massachusetts Department of Environmental Protection (MassDEP) provides additional regulatory agency support.

**1.3 Legal Authority**

Under Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), if new information becomes available that could affect the implementation of a selected remedy for a site, then the nature and significance of such finding(s) must be identified and evaluated in a post-Record of Decision (ROD) document for inclusion in the Administrative Record. In accordance with Section 300.435(c) of the National Contingency Plan (NCP) and EPA guidance (OSWER Directive 9355.3-02), an Explanation of Significant Differences (ESD) is being issued for the AOC Hangar 1 site because the changes do not fundamentally alter the remedy set forth in the ROD with respect to scope, performance, or cost.

In accordance with Section 300.825(a)(2) of the NCP, this ESD will become part of the Administrative Record for AOC Hangar 1, and will be available for public review at the former NAS South Weymouth Caretaker Site Office (Building 11, Shea Memorial Drive) and the local Information Repositories identified below. In addition, a notice that briefly summarizes this ESD will be published in three major local newspapers.

**1.4 Overview of the ESD**

The July 2010 ROD (U.S. Navy, 2010) for AOC Hangar 1 (the Site) specified a No Further Action (NFA) decision for soils and groundwater based on the Navy's completion of a series of investigations and removal actions at the Site. The streamlined human health risk assessment (HHRA) performed at the completion of the removal actions concluded that exposure to the soils and groundwater at the Site does not pose an unacceptable risk to human health or the environment.

Subsequent to issuing the ROD, the Navy performed a perfluorinated compound (PFC) investigation of soil and groundwater in the vicinity of Hangar 1. The investigation revealed the presence of PFCs in groundwater at concentrations exceeding the EPA Provisional Health Advisory (PHA) values for two PFCs: perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). No significant concentrations of PFCs were detected in soils. Based on the results of the investigation it was determined that a modification to the previous NFA decision was warranted to address potential threats associated with the future use of groundwater for drinking water purposes. Specifically, the NFA decision will be modified to include an institutional control to prohibit the use of groundwater for drinking water

purposes. This action covers groundwater in a 22-acre portion of the Site where the groundwater is not a viable drinking water source and, therefore, drinking the water is not a reasonably foreseeable use of the groundwater. South Shore Tri-Town Development Corporation (SSTDC) and the Master Developer of NAS South Weymouth, LNR South Shore, LLC (LNR), have consented to the establishment of this institutional control.

Since the proposed change does not fundamentally alter the overall cleanup approach for the Site, with respect to scope, performance, or cost, the Navy has determined that the issuance of an ESD complies with the aforementioned CERCLA and NCP requirements.

## **1.5 Availability of Documents**

In accordance with Section 300.825(a)(2) of the NCP, this ESD will become part of the Administrative Record for AOC Hangar 1. This ESD is also available for public review at the following locations:

Department of the Navy  
Caretaker Site Office  
c/o David Barney  
1134 Main Street, Bldg. 11  
South Weymouth, MA 02190

Tufts Library  
46 Broad Street  
Weymouth MA 02188  
(781) 337-1402

Abington Public Library  
600 Gliniewicz Way  
Abington, MA 02351  
(781) 982-2139

Hingham Public Library  
66 Leavitt Street  
Hingham, MA 02043  
(781) 741-1405

Rockland Memorial Library  
20 Belmont Street  
Rockland, MA 02370  
(781) 878-1236

## **2.0 SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY**

### **2.1 Site Description and History**

NAS South Weymouth is located approximately 15 miles southeast of Boston, Massachusetts in Norfolk and Plymouth counties and in the Towns of Weymouth, Abington, and Rockland. NAS South Weymouth was operationally closed on September 30, 1996 and administratively closed on September 30, 1997 under the Base Realignment and Closure Act of 1990.

Hangar 1 is a large concrete frame building located in the central portion of the Base with one- and two-story structures attached on the north and south sides (see Figure 1). The two-story structures, referred to as lean-tos, extend beyond the hangar to the east and enclose a concrete paved area. The hangar was built in 1966 on the site of a previous hangar built for dirigibles in 1942. The area around Hangar 1 is covered by concrete pavement (e.g. the aircraft parking apron shown on Figure 1). Metal tracks that formed the opening of the original blimp hangar doors are visible in the concrete. The primary use of Hangar 1 was for storage and maintenance of aircraft, including activities such as metal working, engine work, painting, arming, washing, hydraulic system repair, welding, parachute packing, photo development, training, and plating and anodizing.

Subsurface soil was impacted by chemicals released from the Hangar 1 floor drain system. The floor drain system was removed and more than 100 tons of contaminated soil was subsequently excavated and shipped off site for disposal.

Three groundwater monitoring wells (MW05-302, -303, -304) were installed downgradient of Hangar 1 in the fall of 2002 to determine if contamination from the floor drains had impacted groundwater. No Target

Analyte List and Target Compound List (TAL/TCL) chemicals were detected in groundwater at concentrations above the Maximum Contaminant Levels (MCL) for drinking water. The groundwater sample results did not reveal any evidence of impact to groundwater from the Hangar 1 operations.

The Navy conducted a streamlined HHRA for AOC Hangar 1 in 2009 to determine whether exposure to detected concentrations of chemicals in the post-excavation confirmatory subsurface soil samples and the groundwater samples pose a significant threat to human receptors. Based on these results, and as documented in the AOC Hangar 1 streamlined HHRA, the Navy and EPA concluded that exposures at the Site do not pose an unacceptable risk to human health (Tetra Tech, Inc., 2009). A No Further Action decision for soils and groundwater was documented in the July 2010 ROD.

## **2.2 Remedy Selected in the 2010 ROD**

The July 2010 ROD for AOC Hangar 1 concluded that No Further Action is appropriate for the following reasons:

- The floor drains under Hangar 1 were identified as potential sources of releases to soil and groundwater. The floor drain systems were removed, and post excavation sampling and analysis was performed to identify any releases.
- Areas where concentrations of contaminants were found to exceed human health benchmarks were excavated and disposed off-site.
- Investigation of groundwater in the area of Hangar 1 did not reveal any evidence of impact to groundwater from the Hangar 1 operations.
- Comparison of post-excavation soil sample results to human health benchmarks, along with a human health risk assessment of the soil and groundwater results, concluded that no unacceptable risks to human health remain at the AOC Hangar 1 Site.

## **3.0 BASIS FOR THE DOCUMENT**

New environmental data were collected in 2010 at the request of EPA and MassDEP to investigate the potential presence of PFCs in groundwater. The data were collected to assess the presence and extent of certain PFCs, which are components of aqueous film forming foams (AFFF). AFFF was used, released, and/or spilled in and around Hangar 1. Prior to the April 2010 PFC field investigation, no environmental samples collected at NAS South Weymouth had been analyzed for PFCs. PFCs had not been included as parameters for laboratory analysis since they are considered emerging contaminants and are not on the Target Compound List commonly used for environmental investigations. Since the 2010 groundwater results indicated the presence of PFCs, samples were collected in 2011 to determine the extent of PFCs in groundwater. The field program included re-development of existing monitoring wells, installation of new monitoring wells, and sampling of selected new and existing monitoring wells. See Figure 2 for the locations of monitoring wells in the Hangar 1 vicinity that were sampled during the PFC investigations in 2010 and 2011.

There are currently no MCLs for PFOA and PFOS in groundwater. In January 2009, however, EPA published provisional health advisory (PHA) values for PFOA and PFOS in groundwater used for drinking water: 0.4 µg/L for PFOA and 0.2 µg/L for PFOS (EPA, 2009).

There is a medium yield aquifer beneath a portion of the Hangar 1 area as shown on Figure 2. This aquifer is designated as an aquifer protection district in the South Shore Tri-Town Development Corporation (SSTTDC) Zoning and Land Use By-Laws for NAS South Weymouth (SSTTDC, 2005). As such, the aquifer is considered a Potential Drinking Water Source Area (PDWSA). The groundwater outside of the PDWSA is the subject of this ESD (see Figure 3). SSTTDC and its Master Developer, LNR, have stated that the groundwater outside of the PDWSA in the vicinity of Hangar 1 is not expected

to be utilized for drinking water. The portion of the Hangar 1 area within the aquifer protection district is not part of the ESD and will be the subject of a future decision document.

By this ESD, the Navy is addressing concerns about the presence of PFCs in groundwater at concentrations exceeding the EPA PHA values and their impact on the approximately 22-acre parcel encompassing the aircraft parking apron west and south of Hangar 1 (see Figures 1 and 3). The implementation of institutional controls to prohibit the use of groundwater at the 22-acre parcel outside of the PDWSA for drinking water purposes further supports the Navy's determination that all remedial actions have been taken and that the parcel is suitable to transfer.

#### **4.0 DESCRIPTION OF SIGNIFICANT DIFFERENCES OR NEW ALTERNATIVES**

##### **4.1 Background**

Based on the historic use and spills/releases of AFFF in the vicinity of Hangar 1, groundwater samples for PFOA and PFOS analysis were collected in April 2010 in accordance with the *Final Sampling and Analysis Plan, Perfluorinated Compounds in Groundwater, Former Naval Air Station South Weymouth, Weymouth, Massachusetts* (Tetra Tech, Inc., 2010a). The groundwater results indicated exceedances of the PHA values at some of the monitoring wells (Tetra Tech, Inc., 2010b). In 2011, a second investigation was conducted in accordance with *Final Sampling and Analysis Plan Addendum, Perfluorinated Compounds, Former Naval Air Station South Weymouth, Weymouth, Massachusetts* (Tetra Tech, Inc., 2011). The April 2011 field program included additional groundwater sample collection from existing and new monitoring wells to delineate the extent of the PFC contamination in groundwater.

Although there are no current complete exposure pathways for exposure to groundwater, it is possible in the future that there could be construction projects that would result in certain receptors being exposed to shallow groundwater. Additionally, use of groundwater for irrigation is possible in the future.

As a conservative measure, risk-based screening values were calculated for PFOA and PFOS for the future construction worker who may be incidentally exposed to PFCs in shallow groundwater while working at the site. In addition, since it can be reasonably assumed that exposure (i.e., incidental ingestion and dermal contact) to groundwater used for irrigation would be less frequent and less intense than construction worker exposure, the risk-based screening values developed for the construction worker are also assumed to be sufficiently protective for the future use of groundwater for irrigation or other intermittent, low frequency contact exposure scenarios.

The groundwater data collected from the Hangar 1 area have been compared to the EPA PHA drinking water values and the Navy calculated risk-based values for a potential future construction worker exposed to groundwater via ingestion. Table 1 presents the 2010 and 2011 groundwater data compared to the EPA PHA drinking water values. Table 2 presents the 2010 and 2011 groundwater data compared to the construction worker risk-based screening values. The groundwater data presented in Table 1 indicate that the PHA drinking water values for PFOA were exceeded in 4 of the 12 monitoring wells; PHA values for PFOS were exceeded in 8 of the 12 monitoring wells. However, the results in Table 2 indicate that all of the PFOA and PFOS concentrations detected in groundwater are orders of magnitude lower than the construction worker risk-based screening values for PFOA and PFOS.

##### **4.2 Description of Changes**

This ESD addresses the potential threat if PFC-impacted groundwater outside of the PDWSA is used in the future for drinking water purposes (Table 1). The action will take the form of a land use control, specifically an institutional control (IC) to restrict the use of groundwater outside of the PDWSA for drinking water purposes. Once the ESD has been reviewed and signed by the Navy and EPA, placement of this deed restriction will be the final action for the 22-acre parcel. With the deed restriction in place, all remedial actions will have been taken and the Navy can support a determination that the 22-acre parcel is suitable for transfer. The groundwater restriction will be incorporated in the deed at the time of transfer of the property from Navy to SSTTDC, anticipated to be December 15, 2011.

This ESD documents the decision by the Navy to place a land use control and deed restriction on the use of groundwater outside of the PDWSA for drinking water purposes. The restriction will be placed on the approximately 22 acres of parcel SP-4 shown on Figure 3 where groundwater data indicate there are exceedances of the EPA PHA drinking water values for PFOA and PFOS. SSTDTC and LNR have consented to the establishment of this institutional control. A real estate survey plan of the restricted area within parcel SP-4 will be prepared and incorporated in the transfer deed. The administrative change documented in this ESD will include the following Covenant and Restriction Concerning the Use of Groundwater in the deed:

GRANTEE covenants, on behalf of itself, its successors and assigns, for a period of 999 years, that no wells for drinking water purposes shall be installed or permitted in that certain portion of the CONVEYED PROPERTY known as Subparcel SP-4, as such restricted area of Subparcel SP-4 is more fully described in the legal description and shown on the plan attached hereto as Exhibit C-1 and as also shown on sheet 3 of 5 of the plan entitled "Property Boundary Survey (F.O.S.T. No. 5A), Naval Air Station, South Weymouth" dated September 15, 2008, revised November 4, 2011, prepared by Surveying and Mapping Consultants, Inc., recorded herewith, as area HB-H1C, and referred to herein as "Restricted Portion of SP-4", and if any such well is installed, its use pending removal is prohibited, without the written approval of the EPA and the MassDEP, or their respective successors, as applicable. During the period of Grantee's ownership, Grantee shall not perform or give permission to any person to perform any use or activity in the Restricted Portion of SP-4 inconsistent with this groundwater restriction. This groundwater restriction shall automatically terminate prior to the termination date upon the recording in the appropriate registry of deeds of a notice that there has been: (1) a determination in writing by the EPA and MassDEP that the groundwater at the Restricted Portion of SP-4, and the termination of this groundwater restriction, poses no unacceptable risk to human health or the environment; or (2) written concurrence by the EPA and MassDEP in a determination made by the party then responsible for response actions at the Restricted Portion of SP-4 that the groundwater at the Restricted Portion of SP-4, and the termination of this groundwater restriction, poses no unacceptable risk to human health or the environment, whichever of items (1) or (2) is the first to occur. This groundwater restriction establishes certain rights, liabilities, agreements and obligations for the Restricted Portion of SP-4, and this groundwater restriction shall run with the Restricted Portion of SP-4 and any portion thereof (however it may be divided) for the term thereof. This groundwater restriction shall benefit, and shall be enforceable by, the GOVERNMENT and its successor and assigns, in accordance with M.G.L. c. 184 and other applicable law, including without limitation the right of specific performance.

Attachment 1 to this ESD describes actions to be taken by the Navy to implement, monitor, and enforce the proposed restrictions. This action will be the final remedy for the 22-acre portion of parcel SP-4 in which PFOA and PFOS concentrations in groundwater exceed the EPA PHA drinking water values.

#### **4.3 Changes in Expected Outcomes**

As described in Section 4.2, the implementation of a land use control and deed restriction will not adversely impact the performance or cost of the selected remedy. These changes will allow the Navy to implement and enforce the ICs necessary to protect human health and the environment in the long-term and allow for the beneficial reuse of the 22-acre parcel. The groundwater restriction boundary shown in Figure 3 will be incorporated into property transfer documents.

#### **5.0 SUPPORT AGENCY COMMENTS**

EPA has reviewed and provided comments to this ESD. In signing the ESD, EPA concurs with the findings of this document. MassDEP also reviewed this ESD and provided comments to the Navy. The Navy has addressed the comments received from both EPA and MassDEP. MassDEP has reviewed the Navy responses without further comment or objection.

## **6.0 STATUTORY DETERMINATIONS**

Considering the above-described administrative adjustments to the selected remedy set forth in the 2010 ROD, the Navy believes that the remedy remains protective of human health and the environment. The ICs will provide short- and long-term effectiveness, be cost effective, implementable and be protective of human health and the environment. These changes satisfy CERCLA Section 121(b).

Because the remedy will result in substances remaining onsite above levels that allow for unlimited use and unrestricted exposure, a review will be conducted within 5 years after initiation of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

## **7.0 PUBLIC PARTICIPATION**

Throughout the site's history, the Navy has kept the community and other interested parties apprised of the Hangar 1 and PFC investigation activities through informational meetings, press releases, public meetings, and contact with local officials. Also, the Navy regularly meets to discuss the status and progress of the Installation Restoration Program with the Restoration Advisory Board (RAB), which includes representatives from the local community. Representatives from the Navy, EPA, and MassDEP attend these public meetings.

A 10-day public comment period, from December 1, 2011 to December 10, 2011, was provided for review of this ESD. Responses to comments received during the public comment period are provided in Attachment 2. The changes in the approach to the Site remedy will be presented to the public in the Restoration Advisory Board (RAB) December 2011 update and will be discussed at the RAB meeting to be held on January 12, 2012.

## TABLES

**TABLE 1  
GROUNDWATER RESULTS COMPARED TO PROVISIONAL HEALTH ADVISORY VALUES  
AOC HANGAR 1 EXPLANATION OF SIGNIFICANT DIFFERENCES  
FORMER NAS SOUTH WEYMOUTH  
WEYMOUTH, MASSACHUSETTS**

SAMPLE ID		AFFF-GW- MW05- 031-0410	AFFF-GW- MW05- 033-0410	AFFF-GW- MW05- 302-0410	AFFF-GW- MW05- 303-0410	AFFF-GW- MW05-303- 0410-D	AFFF-GW- MW05-303- 0410-AVG	AFFF-GW- MW05- 304-0410	AFFF-GW- H1MW02- 0511	AFFF-GW- H1MW2D- 0511	AFFF-GW- MW05034- 0511	AFFF-GW- MW05306- 0511	AFFF-GW- MW05307- 0511	AFFF-GW- MW05307- 0511-D	AFFF-GW- MW05307- 0511-AVG	AFFF-GW- MW05308- 0511	AFFF-GW- MW09006- 0511
LOCATION ID		MW05- 031	MW05- 033	MW05- 302	MW05- 303	MW05-303	MW05-303	MW05- 304	H1-MW-2	H1-MW-2D	MW05-034	MW05-306	MW05-307	MW05-307	MW05-307	MW05-308	MW09-006
SAMPLE DATE		04/21/10	04/20/10	04/20/10	04/21/10	04/21/10	04/21/10	04/20/10	05/05/11	05/06/11	05/04/11	05/04/11	05/03/11	05/03/11	05/03/11	05/04/11	05/04/11
SACODE						DUPLICATE	AVERAGE							DUPLICATE	AVERAGE		
CRITERIA	PHA *																
PARAMETERS (ug/L)																	
PFOA	0.4	0.013	0.017	15.0 J	1.7	1.5	1.6	1.6	0.0068 J	0.027	0.079	0.047	0.029	0.031	0.03	0.52	0.36
PFOS	0.2	0.21	0.032	0.37	0.25	0.25	0.25	0.21	0.01 J	0.12	0.24	0.63	0.019 J	0.025 J	0.022 J	21	2.3

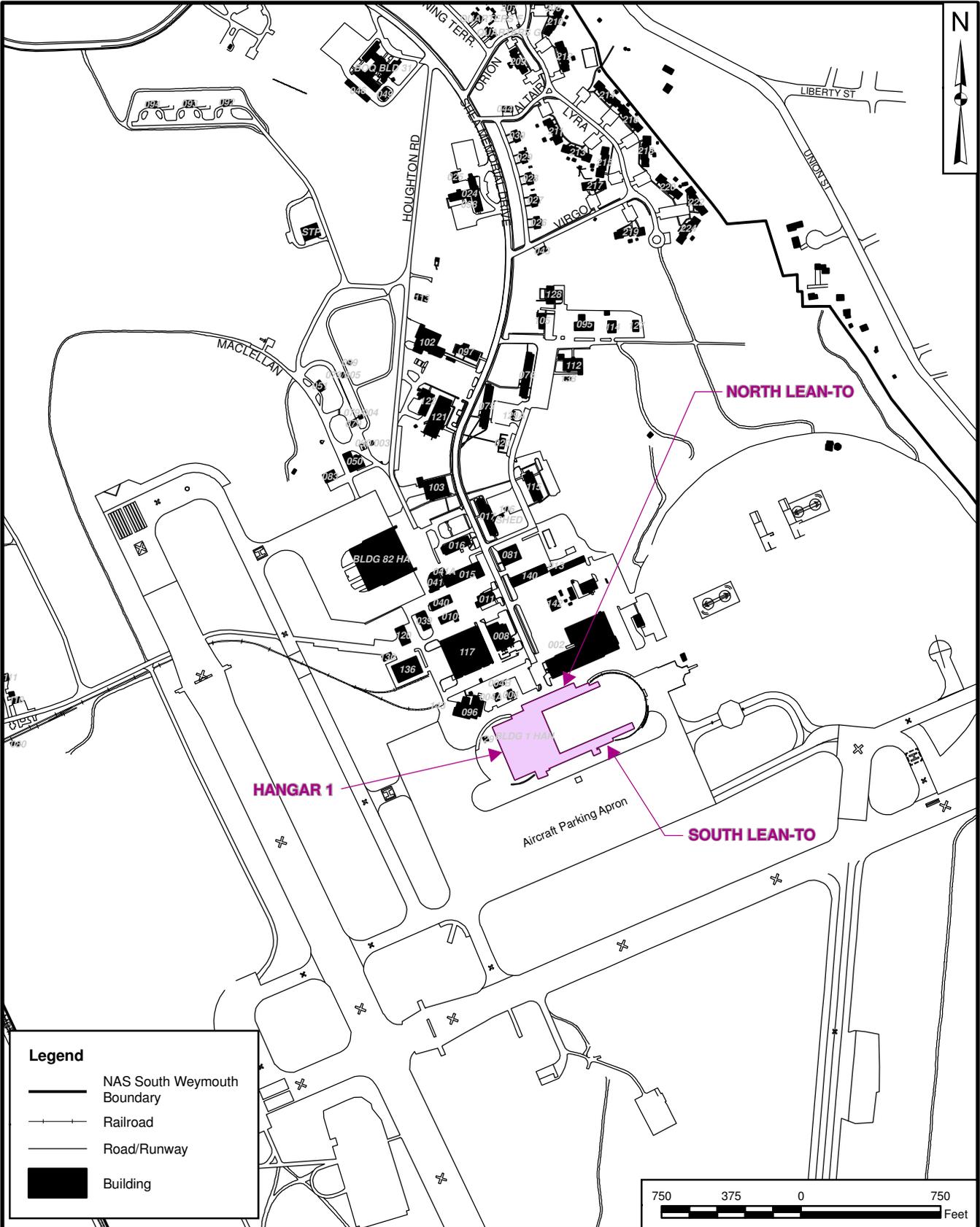
\* PHA - Provisional Health Advisory for groundwater used for drinking water; EPA, January 2009.

**TABLE 2  
GROUNDWATER RESULTS COMPARED TO CONSTRUCTION WORKER EXPOSURE VALUES  
AOC HANGAR 1 EXPLANATION OF SIGNIFICANT DIFFERENCES  
FORMER NAS SOUTH WEYMOUTH  
WEYMOUTH, MASSACHUSETTS**

SAMPLE ID		AFFF-GW- MW05- 031-0410	AFFF-GW- MW05- 033-0410	AFFF-GW- MW05- 302-0410	AFFF-GW- MW05- 303-0410	AFFF-GW- MW05-303- 0410-D	AFFF-GW- MW05-303- 0410-AVG	AFFF-GW- MW05- 304-0410	AFFF-GW- H1MW02- 0511	AFFF-GW- H1MW2D- 0511	AFFF-GW- MW05034- 0511	AFFF-GW- MW05306- 0511	AFFF-GW- MW05307- 0511	AFFF-GW- MW05307- 0511-D	AFFF-GW- MW05307- 0511-AVG	AFFF-GW- MW05308- 0511	AFFF-GW- MW09006- 0511
LOCATION ID		MW05- 031	MW05- 033	MW05- 302	MW05- 303	MW05-303	MW05-303	MW05- 304	H1-MW-2	H1-MW-2D	MW05-034	MW05-306	MW05-307	MW05-307	MW05-307	MW05-308	MW09-006
SAMPLE DATE		04/21/10	04/20/10	04/20/10	04/21/10	04/21/10	04/21/10	04/20/10	05/05/11	05/06/11	05/04/11	05/04/11	05/03/11	05/03/11	05/03/11	05/04/11	05/04/11
SACODE						DUPLICATE	AVERAGE							DUPLICATE	AVERAGE		
CRITERIA	CW *																
PARAMETERS (ug/L)																	
PFOA	3931	0.013	0.017	15.0 J	1.7	1.5	1.6	1.6	0.0068 J	0.027	0.079	0.047	0.029	0.031	0.03	0.52	0.36
PFOS	1572	0.21	0.032	0.37	0.25	0.25	0.25	0.21	0.01 J	0.12	0.24	0.63	0.019 J	0.025 J	0.022 J	21	2.3

\* CW = construction worker value assumes exposure via incidental ingestion. Insufficient information is available to estimate dermal exposure. Values calculated by Navy Marine Corps Public Health Center.

## FIGURES



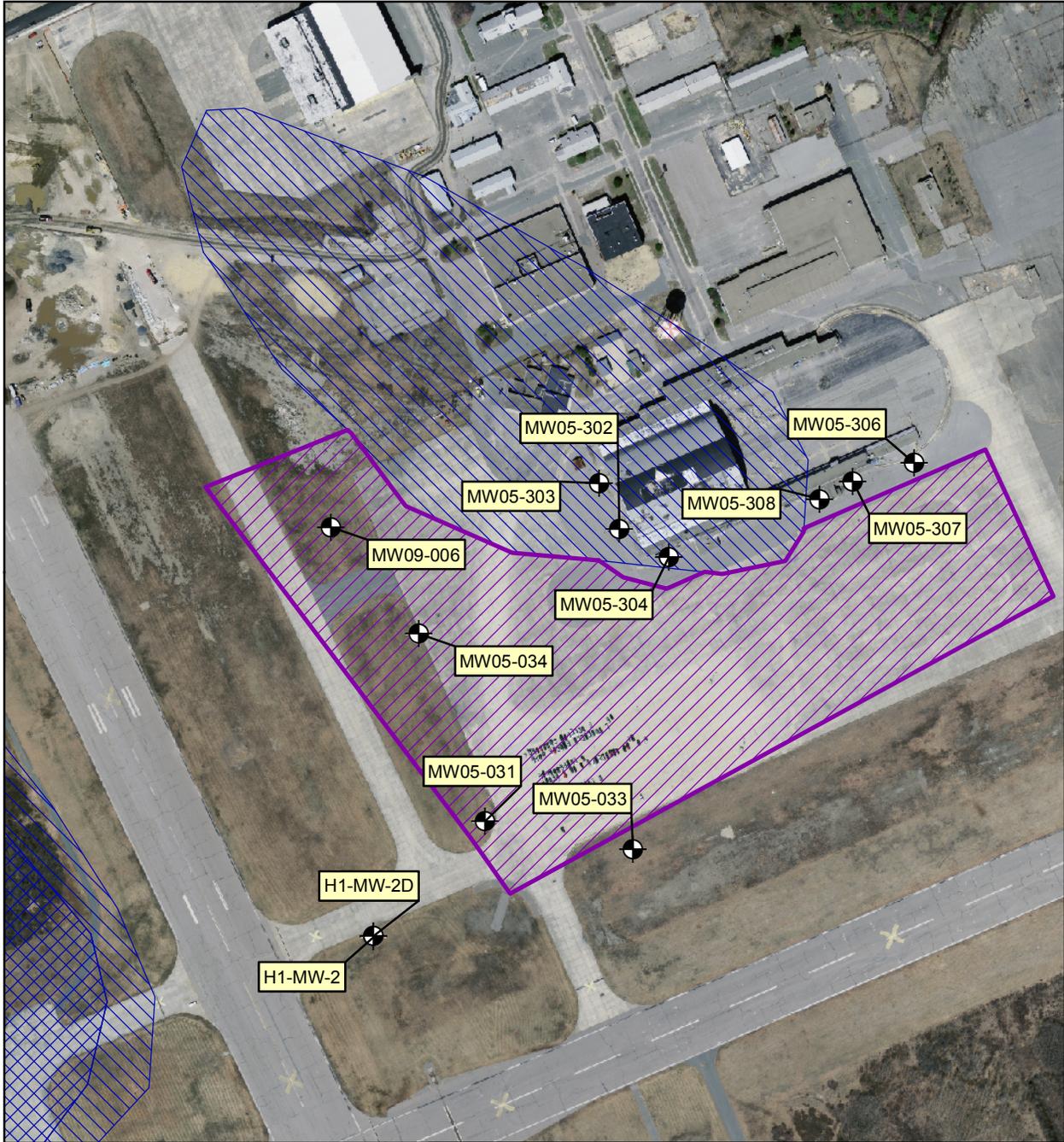
**Legend**

- NAS South Weymouth Boundary
- Railroad
- Road/Runway
- Building

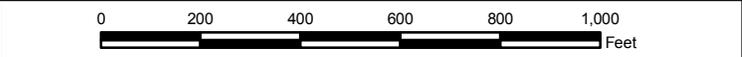


**SITE LOCUS MAP**  
**AOC HANGAR 1**  
**EXPLANATION OF SIGNIFICANT DIFFERENCES**  
**FORMER NAS SOUTH WEYMOUTH**  
**WEYMOUTH, MASSACHUSETTS**

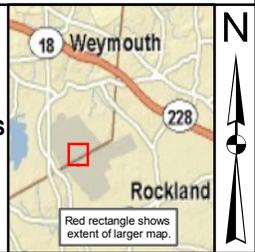
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REV	DATE
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FIGURE NO. 1	



-  Groundwater Monitoring Well
-  Medium Yield Aquifer
-  High Yield Aquifer
-  Groundwater Restriction Boundary

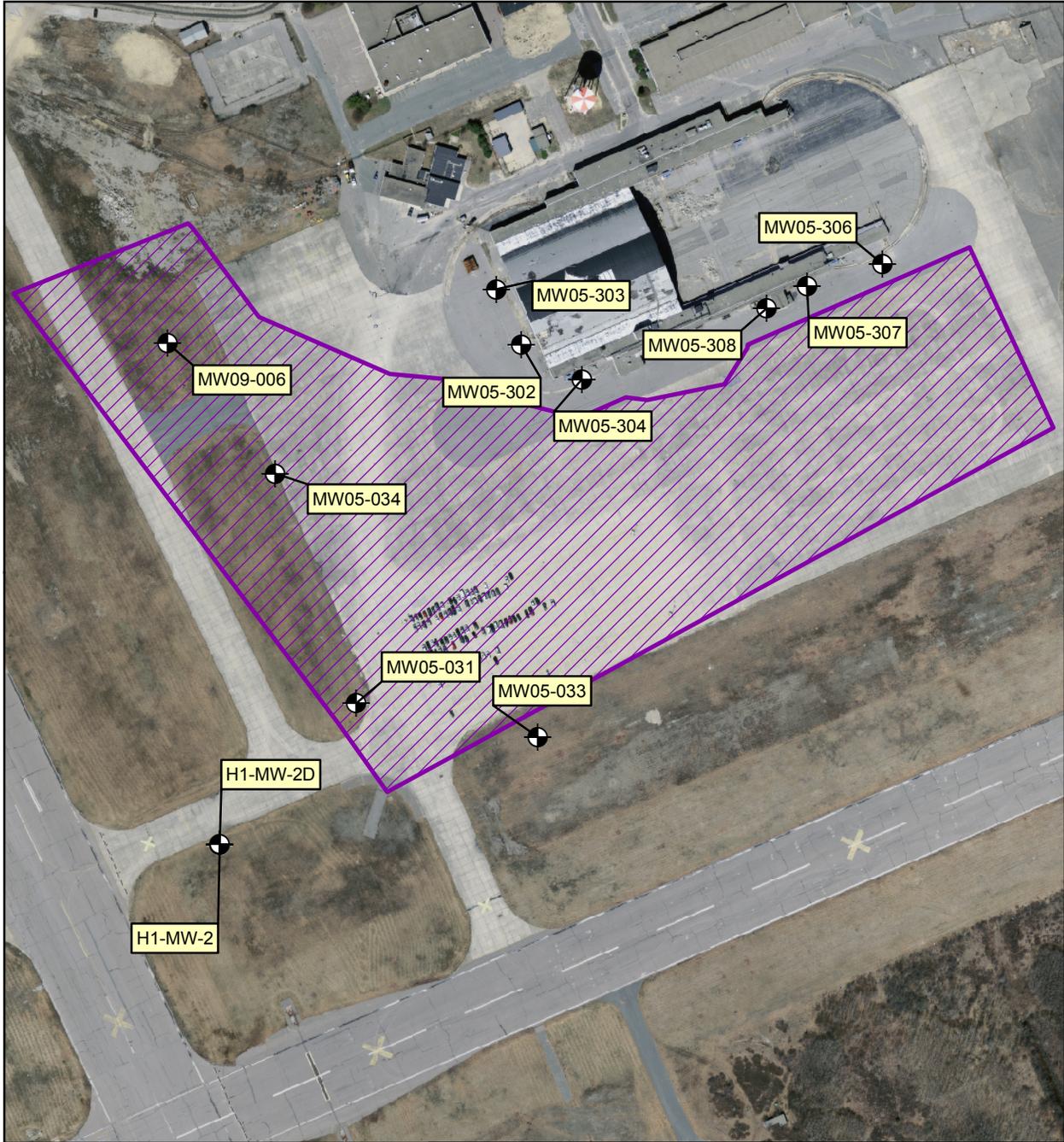


**FIGURE 2**  
**HANGAR 1 VICINITY MONITORING WELLS**  
**AOC HANGAR 1**  
**EXPLANATION OF SIGNIFICANT DIFFERENCES**  
**FORMER NAS SOUTH WEYMOUTH**  
**WEYMOUTH, MASSACHUSETTS**



Date: 12/13/2011 Author: G.J.G.  
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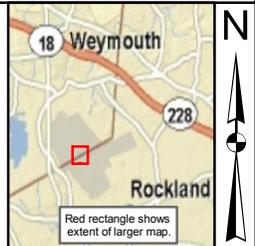




-  Groundwater Monitoring Well
-  Groundwater Restriction Boundary



**FIGURE 3  
GROUNDWATER RESTRICTION AREA  
AOC HANGAR 1  
EXPLANATION OF SIGNIFICANT DIFFERENCES  
FORMER NAS SOUTH WEYMOUTH  
WEYMOUTH, MASSACHUSETTS**



Date: 11/22/2011  
 Author: GJG  
 File Name: I:\02073\DD.DR.RIA\fig3GwRestrictionArea.mxd



## REFERENCES

## REFERENCES

EPA, 2009. *Provisional Health Advisories for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS)*. January 8.

South Shore Tri-Town development Corporation (SSTTDC), 2005. *Zoning and Land Use By-Laws for the Naval Air Station South Weymouth*. May.

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Tetra Tech, Inc., 2010a. *Final Sampling and Analysis Plan, Perfluorinated Compounds in Groundwater*, former NAS South Weymouth, Weymouth, Massachusetts. April.

Tetra Tech, Inc., 2010b. *Perfluorinated Compounds in Groundwater Project Report, Naval Air Station South Weymouth, Weymouth, Massachusetts*. September.

Tetra Tech, Inc., 2011. *Final Sampling and Analysis Plan Addendum, Perfluorinated Compounds*, former NAS South Weymouth, Weymouth, Massachusetts. April.

U.S. Navy, 2010. *Record of Decision, Area of Concern Hangar 1 Main Hangar Floor Drains*, Naval Air Station South Weymouth, Weymouth, Massachusetts. July.

## **ATTACHMENTS**

**ATTACHMENT 1**  
**LAND USE CONTROL IMPLEMENTATION ACTIONS**

Pursuant to this ESD, the Navy is responsible for implementing, inspecting, reporting on, and enforcing the institutional controls in accordance with this Attachment. For purposes of this Attachment, the term "implementation actions" means actions to implement, operate, maintain, and enforce the land use control ("LUC") component of the remedy. The Navy will perform all implementation actions per *The Principles and Procedures for Specifying, Monitoring and Enforcement of Land Use Controls and Other Post-ROD Actions* (2003), the Federal Facilities Agreement (FFA), this ESD, and applicable Navy directives.

As set forth in this Attachment, the following implementation actions will be performed to ensure that the LUC objective, which is to restrict the use of groundwater outside of the PDWSA in this 22-acre portion of the AOC Hangar 1 Site for drinking water purposes, is met in accordance with the FFA. Key elements of the Navy Principles for closed, or BRAC, bases have been incorporated into the actions.

1. Prepare a map depicting the AOC Hangar 1 Site LUC Area boundaries (the "LUC Area").
2. Submit a survey plan showing the LUC Area, prepared by a professional land surveyor registered by the Commonwealth of Massachusetts, in the appropriate Registry of Deeds for the limited purpose of providing public notice of the environmental conditions of and limitations on the use of the property. This survey plan shall be placed in the information repository for CERCLA actions at NAS South Weymouth and copies will be provided to EPA and the Commonwealth of Massachusetts.
3. Incorporate the proposed LUC into property transfer documents (i.e., deed) including a metes and bounds description and/or surveyed map of the LUC Area, as applicable. The terms of the deed will prohibit land uses inconsistent with the LUC for the LUC Area. Changes in land use for the LUC Area subject to the LUC will require prior approval by the Navy in consultation with EPA and the Commonwealth of Massachusetts. Ensure that, prior to transfer by the Navy, no interests remain in the land subject to the institutional controls that conflict with those controls.
4. Monitor compliance with the LUC. LUC monitoring will be conducted by the Navy to verify that the LUC is being properly implemented and the LUC objective is being met. The LUC implementation actions will include annual review of permits issued for the installation of groundwater wells. LUC compliance actions will be conducted on an annual basis unless the frequency is reduced by written agreement with the Navy, EPA, and the Commonwealth of Massachusetts (see 5.d. below).
5. Report and notify regulatory agencies. The notification requirements include the following:
  - a. Notify EPA Region 1 and the Commonwealth of Massachusetts by telephone and by e-mail as soon as practicable but no longer than 72 hours after discovery of any activity that is inconsistent with or not in compliance with the LUC. Notify EPA Region 1 and the Commonwealth of Massachusetts regarding how the non-compliance will be or has been addressed within 10 days of sending EPA Region 1 and the Commonwealth of Massachusetts notification of the non-compliance. Furthermore, any activity that is inconsistent with the LUC will be addressed as soon as practicable, but in no case will the process be initiated later than 10 days after the Navy or other entity becomes aware of the non-compliance. For purposes of this ESD, the activity that is considered non-compliant with the LUC is development of drinking water production or supply wells within the LUC Area.
  - b. Following transfer of the property subject to the LUC, the Navy shall provide a copy of executed deed or transfer documents to EPA Region 1 and the Commonwealth of Massachusetts. Additional notifications associated with property transfer are discussed below:

- The terms of the LUC will be communicated in writing to the new property owners (SSTTDC and LNR South Shore, LLC), EPA Region 1, the Commonwealth of Massachusetts, and the public in this ESD to ensure that the agencies can factor such conditions into their oversight and decision-making activities regarding the property. Concurrent with the transfer of fee title from the Navy to SSTTDC, the LUC will be incorporated into the deed and will also be provided to appropriate state and local agencies. Notice of this LUC will be re-recorded in the appropriate Registry of Deeds every 50 years or until the deed restriction is terminated as described in Section 4.2 of this ESD. Such notice shall be recorded in a manner such that it appears in the chain of title of property that remains subject to the LUC.
  - In accordance with CERCLA 120(h)(3), the transfer of fee title documents (e.g., the deed) from the United States will include those matters required by CERCLA 12(h)(3)(A), including: notice of the type and quantity of hazardous substances stored for 1 year or more, or known to have been released or disposed of on the property and a covenant warranting: a) that all remedial action necessary to protect human health and the environment with respect to any hazardous substances remaining on the property has been taken by the United States before the date of such transfer; and b) that any additional remedial action found to be necessary after the date of such transfer shall be conducted by the Navy. Each deed will also contain a reservation of access to the property for the United States, EPA Region 1, and the Commonwealth of Massachusetts, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the Navy Installation Restoration Program (IRP) and/or the FFA. The deed will contain appropriate provisions to ensure that the LUC will continue to run with the land and will be enforceable by the Navy.
- c. Submit reports of annual inspection. The results of the annual LUC compliance inspection shall be submitted to the EPA Region 1 and the Commonwealth of Massachusetts. The annual inspection reports will be used in preparation of the Five Year Reviews to evaluate the effectiveness of the remedy. The annual report will evaluate the status of the LUC and how any LUC deficiencies or inconsistent uses have been addressed. The annual report will also address whether use of the LUC Area has conformed to such restrictions and controls.
  - d. Notify EPA and the Commonwealth of Massachusetts at least 7 days before any LUC inspection. Both parties will have the opportunity to participate in the LUC inspection if it so chooses.
6. Obtain EPA Region 1 concurrence, in consultation with the Commonwealth of Massachusetts, prior to modifying the LUC. The Navy or other entity shall seek prior concurrence from EPA Region 1, in consultation with the Commonwealth of Massachusetts, before taking any anticipated action that may disrupt the effectiveness of the LUC. Termination of the LUC will be governed by the terms of the deed restriction set forth in Section 4.2 of this ESD.
  7. Evaluate effectiveness of the LUC as part of each Five-Year Review. Site remedy reviews are required by CERCLA and the National Contingency Plan as specified in this ESD. The first Five-Year Review for NAS South Weymouth was completed in July 2009. The next Five-Year Review will be completed in July 2014 and will include an evaluation of this remedy for the LUC Area. Five-Year Reviews will be submitted to EPA Region I and the Commonwealth of Massachusetts for review.

Should the Navy fail to complete LUC implementation actions, the EPA shall notify the Navy Remedial Project Manager (“RPM”) and seek immediate action. Should there be a failure to complete LUC implementation actions after such notification to the Navy, the EPA may notify the Deputy Assistant Secretary of the Navy (Environment) who will ensure that LUC implementation actions are taken.

Ultimate responsibility for assuring that all LUC performance objectives are met and LUC implementation actions are taken remains with the Navy as the party responsible under CERCLA for the remedy.

## **ATTACHMENT 2 RESPONSES TO COMMENTS RECEIVED ON THE DRAFT ESD**

As noted in Section 7 of the ESD, the public was provided an opportunity to comment on the document. The 10-day public comment period was from December 1, 2011 to December 10, 2011. Comments received during the public comment period are presented below along with the Navy's responses.

### **MassDEP Comments, dated December 1, 2011**

Comment 1: Are the proposed restrictions intended to exist in perpetuity, absent the occurrence of the conditions specified in the proposed restriction language? If so, what statutory or other exemption prevents them from being limited to 30 years under M.G.L. c. 184, sec. 23? If not, what mechanisms are in place to ensure that groundwater is not consumed after such restrictions expire after 30 years?

Response: In the event there is a discovery that a proposed restriction is being violated, the Navy will consult with state and federal regulators to determine what necessary and appropriate (administrative and legal) actions should be taken in light of the violation. Please also see Attachment 1.

Comment 2: Will Navy monitor and enforce the proposed restrictions? If so, please include language to that effect in the ESD. If not, who will monitor and enforce them?

Response: The Navy recognizes the responsibility to ensure that the restrictions are implemented. Attachment 1 has been added to the ESD to describe Navy's actions to implement, monitor and enforce the proposed restrictions.

Comment 3: Has Navy or any other party obtained an opinion of counsel that the proposed restrictions are enforceable by Navy under Massachusetts law? We note that these restrictions are not created pursuant to M.G.L. c 21E, sec. 6, and do not have the benefits of that statute.

Response: The Navy is confident that the restrictions are enforceable in accordance with applicable law.

Comment 4: Has title to the restricted parcels be examined in accordance with local conveyancing standards, and has the Navy assured itself that no prior interests will exist at the time of conveyance that do not conflict with the proposed restrictions?

Response: The Navy confirms that there are no issues with the title to the restricted parcel.

Comment 5: After review of the ESD it appears that more supporting documentation is needed to support the use of irrigation in this 22 acre parcel. It would be in the best interest to restrict groundwater use in this 22 acre parcel until documentation can be reviewed by regulatory agencies that can support irrigation use. The deed should reflect that groundwater use is restricted in this 22 acre parcel until this review can be completed. Thus strike the use for irrigation.

Response: The Navy provided the requested documentation, including calculations supporting the risk-based screening level for construction worker incidental contact with shallow groundwater, to MassDEP on December 2, 2011. On December 7, 2011, MassDEP stated that their concerns had been resolved and withdrew this comment.

### **Mary Parsons' Comments, dated December 9, 2011**

Comment 1: Implementing land use controls for drinking water only within a certain area could pose a future health risk through use of the groundwater in the area for irrigation. Using this groundwater for irrigation purposes could spread the PFC's to other areas of the former Naval Air Station South Weymouth. You can't separate the medium yield aquifer from the contaminated groundwater as your

figure 2 shows; furthermore, a municipal drinking water and irrigation well should not be placed in another area that could potentially drawdown water in the future containing PFC's. You can't place a definitive boundary on groundwater. Contaminated water doesn't stay separated from clean water and it would be a matter of time before contaminated water is drawn in to a municipal well system not matter where its location is.

Response: The groundwater restriction boundary shown in Figure 2 represents a portion of the AOC Hangar 1 site. As discussed in the ESD, AOC Hangar 1 and the PFC investigation around Hangar 1 encompass an area larger than the 22-acre portion subject to the proposed restriction in the ESD. Due to the presence of PFCs in portions of the Site which overly the aquifer protection district and Potential Drinking Water Source Area (PDWSA), and based on discussions between the Navy, EPA and MassDEP, the Navy will prepare another decision document for the Site. As noted in Section 3 of the ESD: "The portion of the Hangar 1 area within the aquifer protection district is not part of the ESD and will be the subject of a future decision document."

Comment 2: Land use controls should be placed on water to be used for irrigation and any municipal well for use as drinking water supply in another location that could potentially draw contaminated water into the system.

Response: As noted in the Response to Comment 1, the Navy will prepare another decision document to modify the ROD for the area where concentrations of PFCs have impacted groundwater in the medium-yield aquifer that is considered a PDWSA.

Comment 3: This is groundwater that should remain in the ground. Analysis of PFC's is in its infancy and groundwater containing PFC's needs more investigation before drawing any definite conclusions on its safety for human consumption or contact through use for irrigation purposes.

Response: Please note that the Navy is required to conduct 5-Year Reviews to ensure that this remedy remains protective. If scientific advances are made on the information known about PFCs, it will be incorporated into the 5-Year Review. As discussed in Section 4.1 of the ESD, the risk-based screening values developed for the construction worker would be protective for future use of groundwater for irrigation or other intermittent, low frequency contact exposure scenarios. Both EPA and MassDEP reviewed the Navy's calculations of the construction worker risk-based screening values and concur that a restriction for the use of groundwater for irrigation purposes is not necessary. Please also see MassDEP Comment 5 and the associated response.

**Advocates for Rockland, Abington, Weymouth, and Hingham (ARAWH) Comments, dated December 8, 2011**

Comment 1: We write to comment on the December 2011 Explanation of Significant Differences (ESD) to the Record of Decision proposed by the Navy for Operable Unit 25 (Hangar 1 floor drains). As explained in the ESD, the original health risk assessment for the Hangar 1 floor drains investigation found no significant risks to human health following focused removal of contaminated soils beneath the floor drains. Consequently, the Record of Decision (ROD) determined that the site was suitable for unrestricted use. Subsequent investigation, however, identified perfluorinated compounds (PFCs), specifically perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), to be present in groundwater at concentrations exceeding Provisional Health Advisory (PHA) levels for potable water. Based on these data, the Navy is proposing to amend the ROD to restrict groundwater use for drinking water purposes over a portion of the Hangar 1 floor drain area, as described in the December 2011 ESD.

Response: Comment noted.

Comment 2: We have several concerns over the measures proposed in the ESD. First, there are not enough PFC data to support a robust decision. Each of the monitoring wells was tested for PFOA and PFOS in a single round of sampling. Hence, the levels of contaminants are highly uncertain and could

vary temporally (e.g., by season). Multiple rounds of groundwater data are typically collected to support remedial decisions and land use controls. There are detections of both PFOA and PFOS at wells H1-MW-2D, H1-MW-2, and MW05-033, all located outside of the proposed groundwater restriction zone. While the measured concentrations do not exceed the Provisional Health Advisory (PHA) criteria, the data set is not sufficiently robust to know (based on a single sampling round) that the criteria might not be exceeded at other times of the year.

Response: The Navy has worked cooperatively with EPA and MassDEP to develop and implement the PFC investigation at former NAS South Weymouth. This ESD is focused on a portion of the PFC investigation area and was developed with input from EPA and MassDEP to implement LUCs and restrict the use of groundwater only in the 22-acre portion of the investigation area. Placement of LUCs supports the Navy's determination that all remedial actions have been taken and that the 22-acre parcel is suitable to transfer. Please note that Navy is required to conduct 5-Year Reviews to ensure that this remedy remains protective.

As described in greater detail in the *Final Sampling and Analysis Plan Addendum, Perfluorinated Compounds, Former Naval Air Station South Weymouth, Weymouth, Massachusetts*, based on the April 2010 groundwater investigation, which determined the presence of PFCs in groundwater, the April 2011 investigation then established the extent of the PFCs in groundwater. In addition, samples were collected from other media in April 2011. Once the on-going abatement activities in Hangar 1 are completed by a SSTTDC contractor, the Navy will collect soil samples within the hangar and complete the PFC investigation. Following validation of the soil sample results, the Navy will prepare a report that describes the PFC investigation field activities and presents all of the data. This report will include not only the data for the 12 wells included in the ESD tables, but also the other 22 wells included in the PFC investigation.

Comment 3: Second, the areal extent of PFC contamination in groundwater has not been defined adequately. Both PFOS and PFOA are detected in each and every well that was sampled. Groundwater must be sampled at enough locations to define boundaries of the extent of contamination, which typically involves incremental expansion of the sampling domain until chemicals are no longer detected at the edges (or detected at very low concentrations within a clear pattern). The extent of PFC contamination has not been established, especially in various directions from the locations of the highest detected concentrations (MW05-302 for PFOA at 15 µg/l, and MW05308 for PFOS at 21 µg/l). The necessary size of the groundwater restriction zone cannot be determined without knowing the extent of contamination. For example, the appropriate boundaries northwest and southwest of monitoring well location MW09-006 are not well established, as the extent of exceedance of the PHA for PFOS is unbounded toward the northwest.

Response: As noted in the Response to Comment 2 above, the PFC investigation included a total of 34 sampling locations, 12 of which are in the vicinity of the subject area outside the PDWSA. PFCs were not detected in some of the 34 wells; the extent of PFC contamination will be discussed in the project report to be prepared after completion of the field program. The wells referenced in the comment, e.g. MW05-302 and MW05-308, are within or abutting the PDWSA and will be included in a future decision document, as stated in Section 3 of the ESD.

Comment 4: Third, the proposed groundwater restriction zone should be expanded based even on presently available data. Concentrations of PFOS exceed the PHA at wells MW05-306 and MW05-308, but these locations are not included within the proposed groundwater restriction zone. In fact, the highest concentration of PFOS was detected at MW05-308. The groundwater restriction zone must be expanded to include these wells and beyond, based on better definition of the extent of contamination (as described above). There also appears to be a small area that has been inadvertently excluded from the groundwater restriction zone. The Figure 2 outlines of the proposed groundwater restriction zone and the medium yield aquifer to the immediate north fit perfectly (sharing a common border/boundary) except for a very small area just to the south of monitoring well MW05-304, which is depicted as outside of either area (though surrounded by the two areas). Exclusion of this area is presumably a drafting error, as the groundwater beneath this region is almost certainly contaminated.

Response: The ESD covers an area outside the PDWSA, west and south of the AOC Hangar 1 site. The two wells referenced in the comment are within the portion of the AOC Hangar 1 site that will be covered in a future decision document. Please see the Responses to Comments 2 and 3 above. The outlines shown in Figure 2 are correct. The northern portion of the groundwater restriction boundary shown on Figure 2 coincides with the boundary of property transfer subparcel SP-4. The balance of the Hangar 1 area, including the portion within the PDWSA as well as the area to the east which encompasses the north and south lean-tos (see Figure 1), is part of property transfer subparcel SP-28. The groundwater restriction boundary therefore was established to follow the subparcel SP-4 outline as well as the limits of the medium yield aquifer, or PDWSA.

Comment 5: Fourth, establishing the proposed groundwater restriction zone may not be successful at preventing use of the contaminated groundwater if a supply well is placed in the adjacent medium yield aquifer. Given its limited size, a water supply well placed in the medium yield aquifer region would likely draw a portion of its water from beneath the proposed groundwater restriction zone. Potential groundwater use cannot be restricted in a piece-meal manner at the base – there needs either to be unilateral restrictions on groundwater use across the base, or an integrated examination of potential groundwater use that accounts for the manner in which various areas of contamination might affect water quality across the base.

Response: As discussed in the responses above, the balance of the AOC Hangar 1 site, including the area within the PDWSA, will be the subject of a future decision document. Groundwater restrictions, as with other institutional controls, are considered based on site-specific data, e.g. extent of contamination and groundwater flow direction, and future development of the site based on the SSTDZ zoning and re-use plan.

Comment 6: Fifth, the proposed groundwater restriction zone fails to prevent the installation of groundwater wells for non-potable uses. A water irrigation well, for example, could be installed to use water for landscaping, watering, etc. Since the risk assessment only considered potable water use, there is no basis for determining whether non-potable water use is acceptable. One potential concern over use of the groundwater for non-potable uses such as watering lawns might be the spreading of the PFOA and PFOS contamination to the surface. Such a scenario could, for example, endanger wildlife, as potential ecological risks associated with PFC contaminants are inadequately known at present. Either a more comprehensive risk assessment would need to be developed that examines potential risks associated with non-potable groundwater use, or the restrictions should be strengthened to exclude all uses of groundwater.

Response: As described in Section 4.1 of the ESD, there is no need for a restriction on the use of groundwater for irrigation purposes. Risk-based screening values for the PFCs, PFOA and PFOS, were developed for the construction worker based on exposure via ingestion of groundwater. Risk-based screening values can't be calculated for dermal or inhalation exposure since: 1) for dermal exposure to water chemical-specific information on PFOA and PFOS are needed to calculate the transport across the skin consistently with EPA's 2004 RAGS Part E guidance; there are no permeability coefficients (Kp) for PFOA and PFOS; and 2) PFCs are not volatile (contradicts their purpose for smothering fire) and there are no available inhalation toxicity values. Since it can be reasonably assumed that exposure (i.e., incidental ingestion and dermal contact) to groundwater used for irrigation would be less frequent and less intense than construction worker exposure, the risk-based screening values developed for the construction worker are also assumed to be sufficiently protective for the future use of groundwater for irrigation or other intermittent, low frequency contact exposure scenarios. Please also see the Responses to MassDEP Comment 5 and M. Parsons' Comment 3.

#### **Harvey Welch Comments, dated December 10, 2011**

Comment 1: There are many statements in the Explanation of Significant Differences which raise serious concerns.

1. Perfluorooctanoic Acid and Perfluorooctane Sulfonate are considered emerging contaminants and no field investigation or environmental samples were collected for laboratory analysis to April 2010.
2. There are currently no Maximum Contaminant Levels for PFOA and PFOS in groundwater.
3. The 22 acre parcel could be developed where construction workers could be exposed to PFOA and PFOS.
4. The ground water could be used for irrigation in the future.
5. The Institutional Control is for the 22 acre parcel SP4 which places a restriction on groundwater for drinking water, but does not restrict the use of ground water for irrigation.
6. The covenant and restriction in the deed could be terminated by a determination made by the party then responsible for response actions, with written concurrence by EPA and MassDEP. (The EPA and MassDEP should make the determination with independent Field and Lab work.)
7. SSTDTC and its Master Developer stated the ground water outside the Potential Drinking Water Source Area in the vicinity of Hangar 1 is not expected to be utilized for drinking water.

The statements listed above raise serious concerns about the use of groundwater on the 22 acre parcel SP4 for irrigation and possibly for drinking water.

Response: The statements in the comment correctly reflect information contained in the ESD. Note that the purpose of the ESD is to ensure that groundwater in the 22-acre parcel will not be used for drinking water. The land use control and deed restriction (Section 4.2 of the ESD) will prohibit use of groundwater for drinking water purposes in the 22-acre portion of the AOC Hangar 1 Site. As discussed in Section 4.1 of the ESD, there is no need for a restriction on the use of groundwater for irrigation purposes. The risk-based screening values developed for the construction worker would be protective for future use of groundwater for irrigation or other intermittent, low frequency contact exposure scenarios. Both EPA and MassDEP reviewed the risk-screening values and concur that a restriction on the use of groundwater for irrigation purposes is not necessary. Please also see the Responses to MassDEP Comment 5, M. Parsons' Comment 3, and ARAWH Comment 6.

As stated in Section 6 of the ESD, since substances will remain on the site above levels that allow for unlimited use and unrestricted exposure, a review will be conducted within 5 years after completion of this ESD to ensure that the remedy continues to provide adequate protection of human health and the environment

Comment 2: The contaminants PFOA and PFOS are considered newly emerging. And the Maximum Contaminant Level for groundwater has not been established.

Response: The Navy is required to conduct 5-Year Reviews to ensure that this remedy remains protective (see Section 6 of the ESD). If scientific advances are made and additional information becomes available about PFCs, it will be incorporated into the 5-Year Review.

Comment 3: These chemicals could be found to be carcinogenic which still has not been determined.

Response: Please see the Response to Comment 2 above.

Comment 4: Based on the fact that the contaminants PFOA and PFOS are being left in place, the groundwater on the 22 acre site should not be used for irrigation or a possible drinking water source because of potential serious health risks.

Response: The ESD documents the decision by the Navy to place a land use control and deed restriction on the 22-acre parcel that prohibits the use of groundwater for drinking water purposes. As stated in the Response to Comment 1, a restriction on the use of groundwater for irrigation purposes is not necessary.