



TETRA TECH

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August 11, 2010

Project Number G02073

Mr. Brian Helland, RPM
BRAC PMO, Northeast
4911 South Broad Street
Philadelphia, Pennsylvania 19112

Reference: CLEAN Contract No. N62470-08-D-1001
Contract Task Order (CTO) No. WE11

Subject: Signed Record of Decision
Area of Concern Hangar 1 (Main Hangar Floor Drains)
Naval Air Station South Weymouth, Weymouth, Massachusetts

Dear Mr. Helland:

Enclosed is the completed Record of Decision (ROD) for Area of Concern Hangar 1 (Main Hangar Floor Drains), at the former Naval Air Station (NAS) South Weymouth in Weymouth, Massachusetts. The ROD was signed by Navy on July 30, 2010 and by the U.S. Environmental Protection Agency (EPA) on August 9, 2010. The Massachusetts Department of Environmental Protection (MassDEP) provided their concurrence in correspondence dated August 4, 2010. Copies of the ROD are being distributed to Navy, EPA, MassDEP, Information Repositories, and others, as indicated on the distribution list below. The document will also be available at the Navy BRAC Program Management Office web site: <http://www.bracpmo.navy.mil/basepage.aspx?baseid=71>.

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), a legal notice announcing the availability of the ROD will be published in local newspapers. Any questions regarding the document should be directed to your attention at (215) 897-4912. Please contact me at (978) 474-8403 if you have any questions.

Very truly yours,

Phoebe A. Call
Project Manager

PAC/lh

Enclosures

- c: D. Barney, Navy (w/encl. – 1 paper, 1 CD)
- K. Keckler, EPA (w/encl. – 1 paper, 2 CD)
- D. Chaffin, MassDEP (w/encl. – 1 paper, 1 CD)
- D. Galluzzo, Weymouth (w/encl. – 1 CD)
- M. Parsons, on behalf of ARAWH (w/encl. – 1 CD)
- J. Trepanowski, TtNUS (w/o encl)
- G. Glenn, TtNUS (w/o encl.)
- D. Straker, TtNUS (w/encl. – 1 paper)
- G. Wagner, TtNUS (w/encl. 1 paper, 1 CD)
- File G02073-3.2 (w/o encl.); G02073-8.0 (w/encl. - 1)

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RECORD OF DECISION

**AREA OF CONCERN HANGAR 1
MAIN HANGAR FLOOR DRAINS**

**NAVAL AIR STATION SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS**

**BRAC PMO NORTHEAST
U.S. NAVY**



JULY 2010

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ABBREVIATIONS AND ACRONYMS

AOC	Area of Concern
BAP	Benzo(a)pyrene
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSF	Cancer Slope Factor
COPC	Contaminant of Potential Concern
EBS	Environmental Baseline Survey
EPA	Environmental Protection Agency
EPC	Exposure Point Concentration
EPH	Extractable Petroleum Hydrocarbons
HHRA	Human Health Risk Assessment
HI	Hazard Index
MassDEP	Massachusetts Department of Environmental Protection
MCL	Maximum Contaminant Level
MCP	Massachusetts Contingency Plan
NAS	Naval Air Station
NPL	National Priority List
PCB	Polychlorinated Biphenyl
PAH	Polycyclic Aromatic Hydrocarbon
OWS	Oil Water Separator
RAB	Restoration Advisory Board
RfD	Reference Dose
RIA	Review Item Area
RME	Reasonable Maximum Exposure
ROD	Record of Decision
RSL	Regional Screening Level
SSL	Soil Screening Level
SVOCs	Semi-volatile Organic Compounds
TtNUS	Tetra Tech NUS, Inc.
TCRA	Time Critical Removal Action
UCL	Upper Confidence Limit
UST	Underground Storage Tank

1.0 DECLARATION

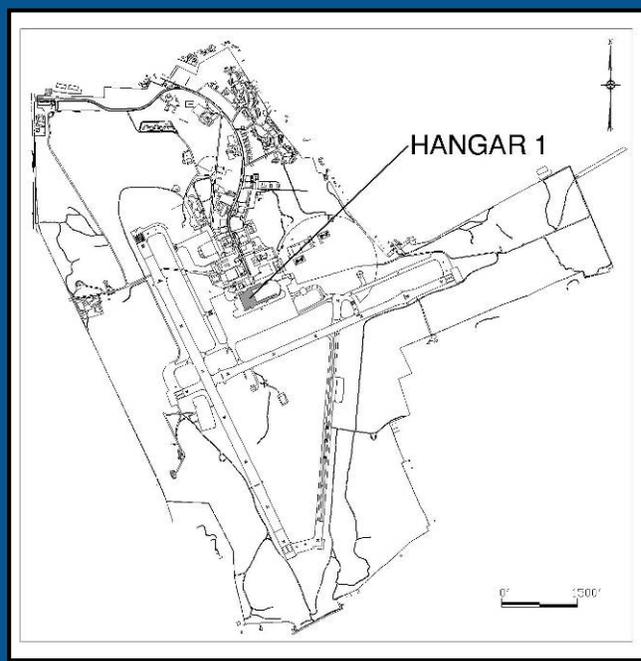
1.1 SITE NAME AND LOCATION

Area of Concern (AOC) Hangar 1 – Operable Unit 25, Main Hangar Floor Drains, at Naval Air Station (NAS) South Weymouth, Weymouth, Massachusetts, United States Environmental Protection Agency (EPA) ID number MA2170022022.

1.2 STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the No Further Action decision for soils and groundwater at AOC Hangar 1, Main Hangar Floor Drains, (see Figure 1-1) at the former NAS South Weymouth, Weymouth, Massachusetts. The decision was made in accordance with the Comprehensive Environmental

FIGURE 1-1. AOC HANGAR 1 LOCATION MAP



Response, Compensation, and Liability Act of 1980 (CERCLA), 42 USC § 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations Part 300 et seq., as amended. The regulatory program performed under the context of these combined laws and regulations is commonly referred to as “Superfund.” This decision is based on information contained in the Administrative Record for the site, which is available for review at the Navy’s Caretaker Site Office located at NAS South Weymouth and also at public Information Repositories maintained at libraries in the abutting towns of Weymouth, Abington, Rockland, and Hingham. The United States Environmental Protection Agency (EPA) and the Navy have agreed on the No Further Action decision for soils and groundwater at this site and the Massachusetts Department of Environmental Protection (MassDEP) concurs with the No Further Action decision for soils and

groundwater (see Appendix A for MassDEP concurrence letter).

1.3 DESCRIPTION OF SELECTED REMEDY

No Further CERCLA remedial action for soils and groundwater is necessary at AOC Hangar 1, Main Hangar Floor Drains. The No Further Action decision for soils and groundwater at AOC Hangar 1 is based on the Navy’s successful completion of a series of investigations and removal actions at the site. Based on the conclusions of the streamlined human health risk assessment performed at the completion of the removal actions, the soils and groundwater at the site do not pose an unacceptable risk to human health or the environment. There is no exposure pathway for ecological receptors.

1.4 STATUTORY DETERMINATIONS

No further cleanup actions are necessary at AOC Hangar 1 under CERCLA to ensure protection of human health and the environment. Previous responses at the site have adequately addressed site risks. Under CERCLA, if no unacceptable risks to human health or the environment are identified, then no further actions, investigations, or monitoring is required. The remedy completed for the site does not

result in hazardous substances remaining on site in excess of levels that allow for unlimited use and unrestricted exposure; therefore, five-year reviews will not be required.

1.5 AUTHORIZING SIGNATURES

This ROD documents that No Further Action is necessary to ensure protection of human health and the environment for AOC Hangar 1 (Main Hangar Floor Drains) at the former NAS South Weymouth. MassDEP's statement on the selected decision is presented in Appendix A.

Concur and recommend for implementation:



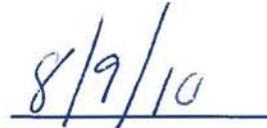
David A. Barney
BRAC Environmental Coordinator
Naval Air Station South Weymouth
U.S. Navy



Date

Concur and recommend for implementation:

fa 
James T. Owens, III
Director, Office of Site Remediation and Restoration
Region 1 – New England
U.S. EPA


Date

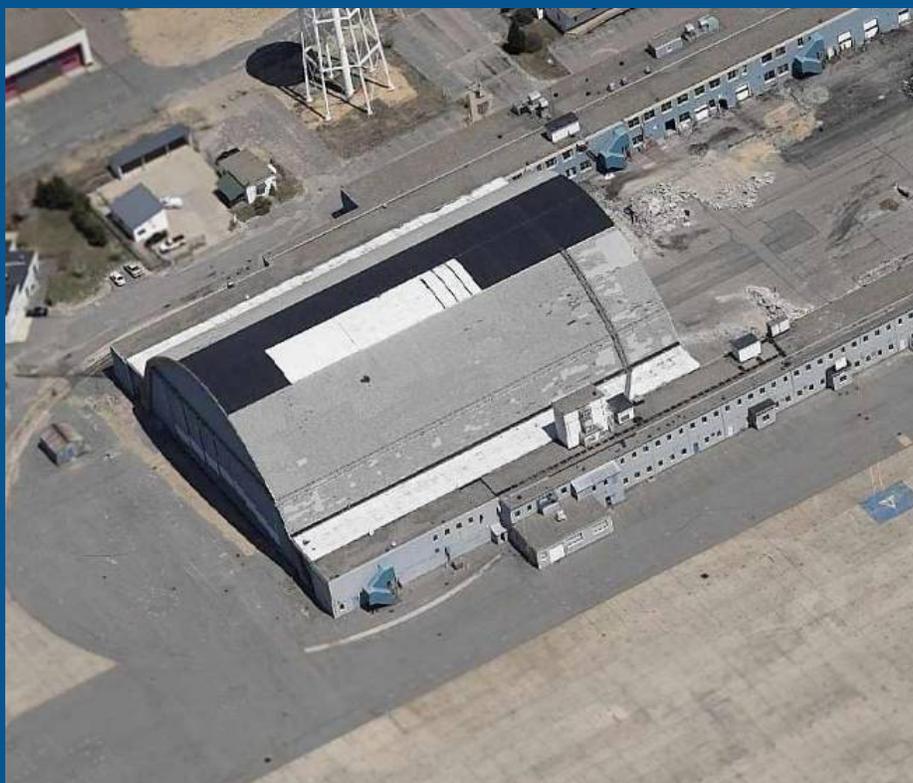
2.0 DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND BRIEF DESCRIPTION

The former NAS South Weymouth, EPA ID number MA2170022022, is located primarily in the Town of Weymouth, Massachusetts. Portions of the Base extend into the adjacent Towns of Abington and Rockland, Massachusetts. NAS South Weymouth was placed on the National Priorities List (NPL) in May 1994 by EPA, pursuant to CERCLA. During its operational period (1940s to 1996), NAS South Weymouth was owned by the United States government and was operated by the Department of the Navy.

AOC Hangar 1 addresses subsurface soil and groundwater beneath the former floor drains in the main hangar bay area. Subsurface soil was impacted by chemicals released from the Hangar 1 floor drain system. Hangar 1 is a large structure, located in the central portion of the Base, with a distinctive arched roof (Figure 2-1) that was built in 1966 on the site of a previous hangar built for dirigibles in 1942. 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 (Foster Wheeler Environmental, 2001a).

FIGURE 2-1. HANGAR 1, CIRCA 2005



2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

Table 2-1 provides brief summaries of previous investigations at AOC Hangar 1. Results of the initial investigations indicated a suspected breach in the floor drain system and elevated concentrations of PCBs and naphthalene in subsurface soil at the site. The floor drain system was removed and the contaminated soil (104.58 tons) was subsequently excavated and shipped off site for disposal. The nature and extent of soil contamination is discussed in Section 2.5.

TABLE 2-1. PREVIOUS INVESTIGATIONS AND SITE DOCUMENTATION

INVESTIGATION	DATE	ACTIVITIES
Environmental Baseline Survey (EBS), Phase I	1995	Floor drains beneath Hangar 1 were identified as a potential source of contamination to subsurface soil and possibly groundwater.
Hydrostatic Testing of Floor Drain Systems	1998	The two floor drain systems beneath Hangar 1 failed hydrostatic tests. A subsequent video camera inspection showed sediment build-up. Due to suspected breaches in the drain systems, the Navy ordered their removal.
Removal Action Report for Building 1	1999	Documented activities associated with cleaning, testing, and camera inspection of the Hangar 1 floor drain systems and the cleaning and removal of three above-ground storage tanks and two oil water separators (OWSs).
Time Critical Removal Action (TCRA) Memorandum for Building 1	2001	Evaluated current site conditions, documented the need for a removal action at Hangar 1, identified the proposed action, and explained the rationale for the removal.
Removal Action Report for Floor Drain System Removal	2001	Documented activities associated with cleaning, testing, and removal of the Hangar 1 floor drain systems. Field screening and confirmatory sampling results for soil beneath the drains indicated a potential risk due to the presence of PCBs at concentrations in excess of 1 ppm.
Removal Action Report for Floor Drain System Soil Remediation	2001	Documented removal activities associated with the TCRA to remove and dispose of contaminated soil beneath the Hangar 1 floor drain systems. Soil was removed to a depth of 2 feet below the existing trench floor and approximately 10 feet in each lateral direction. Confirmatory sampling results indicated that additional excavation was necessary at one location due to a PCB exceedance and at two locations because volatile petroleum hydrocarbon concentrations exceeded criteria. All criteria were met following re-excavation at these locations.
Phase II EBS Field Report	2004	Described the installation and collection of groundwater samples from three monitoring wells to determine if groundwater beneath the site had been impacted by contaminated soil under the floor drain system. Analytical results indicated that chloroform, iron, and manganese concentrations exceeded risk-screening benchmarks.
Streamlined Human Health Risk Assessment (HHRA)	2009	Included screening of analytical results from 32 confirmatory subsurface soil and 3 groundwater sampling locations. The HHRA determined that adverse human health effects are not anticipated due to site-related contaminants at AOC Hangar 1.

There have been no cited violations under federal or state environmental law or any past or pending enforcement actions pertaining to the cleanup of AOC Hangar 1.

2.3 COMMUNITY PARTICIPATION

The Navy performs public participation activities in accordance with CERCLA and the NCP. The Navy has kept the community and other interested parties apprised of NAS South Weymouth environmental activities through informational meetings, fact sheets, press releases, public meetings, regular contact with local officials, and a public website. Also, the Navy meets on a regular basis with the Restoration Advisory Board (RAB), which is comprised of community leaders, government agency representatives, and local citizens, to discuss the progress of the environmental cleanup activities at NAS South Weymouth. Representatives from the Navy, EPA Region 1, MassDEP, and local government attend public meetings and hearings. A brief summary of public outreach efforts for AOC Hangar 1 is provided below.

The RAB has met frequently since its inception in 1995 and currently meets bi-monthly. AOC Hangar 1 investigation activities, results, and associated remedial decisions have been discussed at RAB meetings. Information Repositories for NAS South Weymouth have been established at the Tufts Library in Weymouth, Massachusetts; the Abington Public Library in Abington, Massachusetts; the Hingham Public Library in Hingham, Massachusetts; and the Rockland Memorial Library in Rockland, Massachusetts.

Documents and other relevant site information, including a copy of the Administrative Record Index, are available for public review at the Information Repositories.

The Navy distributed copies of the Proposed Plan to a mailing list of approximately 330 community members, local elected officials, and the local Information Repositories. In accordance with Sections 113 and 117 of CERCLA, the Navy provided a public comment period from March 23 to April 22, 2010, for the No Further Action decision described in the Proposed Plan for AOC Hangar 1. A public meeting to present the Proposed Plan was held on April 8, 2010, at the New England Wildlife Center in Weymouth, Massachusetts. The public meeting was followed by a public hearing to accept oral comments on the Proposed Plan. Public notice of the meeting/hearing and availability of documents was published in the Patriot Ledger (March 24, 2010), Weymouth News (March 31, 2010), and Abington-Rockland Mariner/Standard (March 26, 2010). Comments received on the Proposed Plan are addressed in Section 3.

2.4 SCOPE AND ROLE OF OPERABLE UNIT

The Department of the Navy is the lead agency and EPA is the lead regulatory agency for CERCLA activities at NAS South Weymouth. MassDEP also reviews and provides comments on environmental site activities. The United States Department of Defense is the sole source of cleanup funding for the property under the Navy Base Realignment and Closure (BRAC) program. There are several operable units at NAS South Weymouth that the Navy is addressing under CERCLA. This ROD pertains to AOC Hangar 1, Operable Unit 25.

AOC Hangar 1 is part of a comprehensive environmental investigation and cleanup program currently being performed at NAS South Weymouth under CERCLA authority, pursuant to the Federal Facility Agreement that became effective April 7, 2000. AOC Hangar 1 was originally identified in the Phase I EBS Report as Review Item Area (RIA) Hangar 1. In accordance with the EBS process for NAS South Weymouth, the identified RIAs required further evaluation due to the potential for contamination. Upon further evaluation EBS RIAs at NAS South Weymouth were designated as CERCLA AOCs when one or more CERCLA hazardous substances were detected in excess of human health or ecological risk benchmarks, and applicable Base background values for polycyclic aromatic hydrocarbons (PAHs) and metals. The Navy has then conducted either streamlined risk assessments and/or removal actions at the various AOCs. At AOC Hangar 1, the Navy sampled soil and groundwater and conducted removal actions to address PCBs and naphthalene detected in subsurface soil beneath the Hangar 1 floor drain systems. A streamlined HHRA was subsequently conducted to evaluate post-excavation soil and groundwater data. No ecological evaluation was required because the data were for subsurface samples and there is no complete exposure pathway for ecological receptors. The results of the removal actions and HHRA indicate that no unacceptable risks to human health remain at AOC Hangar 1.

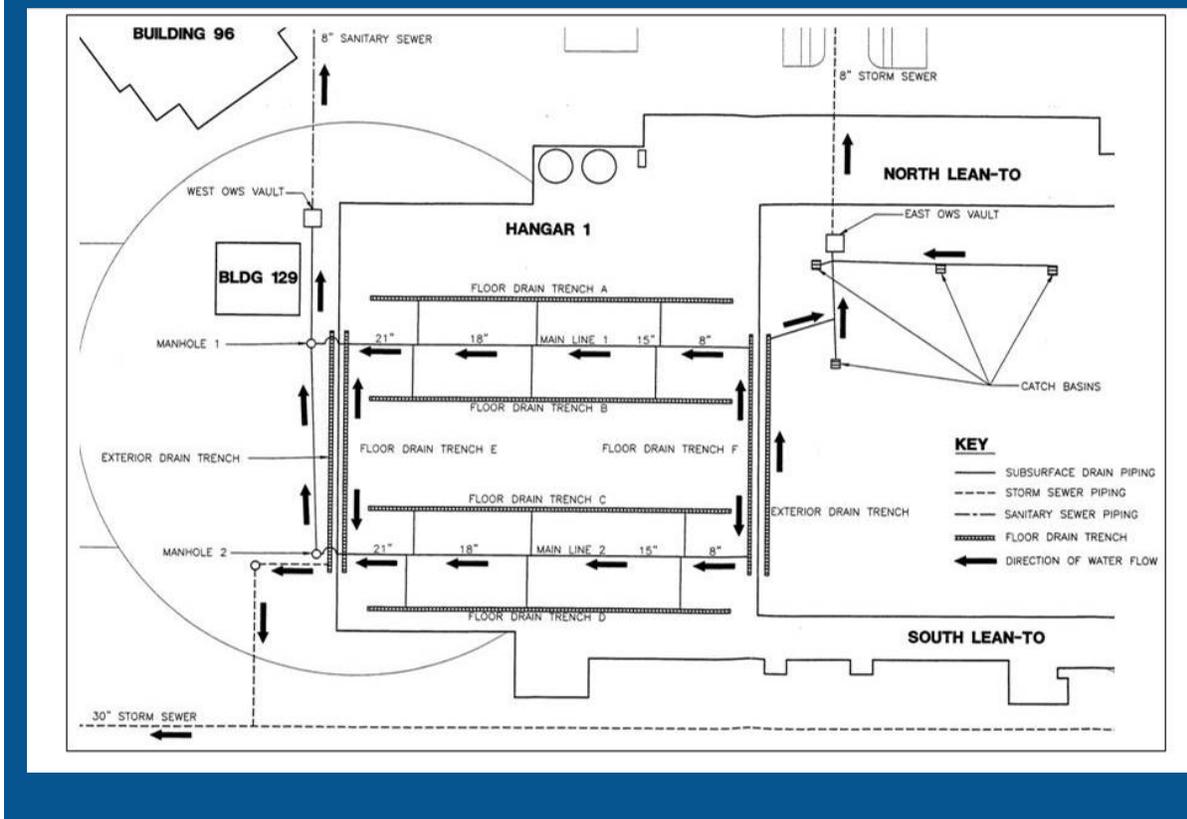
The ROD for AOC Hangar 1 is one component of the Superfund program at NAS South Weymouth. AOC Hangar 1 has proceeded on an independent track from the other operable units and AOCs to enable the Navy to expedite site closure and property transfer. The signing of this ROD by the Navy and EPA Region 1 indicates the completion of the Superfund process for AOC Hangar 1. No additional actions or investigations of soil and groundwater at AOC Hangar 1 are required under CERCLA. Additional details on the strategy and schedule for the remediation of the other operable units and a schedule for AOC activities at NAS South Weymouth are available in the Navy's Site Management Plan which is updated annually.

2.5 SITE CHARACTERISTICS

Figure 2-2 shows the two former floor drain systems (located beneath the Hangar 1 structure) that comprise AOC Hangar 1. These systems provided drainage of the interior of Hangar 1 and were identified during the EBS process as a potential source of contamination to subsurface soil and groundwater. The two distinct floor drain systems, referred to as Floor Drain System 1 and Floor Drain System 2, consisted of trench drains in the hangar floor and the associated underground piping that ultimately discharged to the sanitary sewer system. Floor Drain System 1 consisted of Trenches A, B, E, and F joined by Main Line 1, and Floor Drain System 2 consisted of Trenches C, D, E, and F joined by

Main Line 2. The manholes and western OWS, through which flow from these drains was routed, were removed prior to the drains and are not included in this discussion.

FIGURE 2-2. AOC HANGAR 1 FLOOR DRAIN SYSTEMS



After the floor drain systems were cleaned and failed hydrostatic testing in 1998, a subsequent video camera inspection revealed a build-up of sediment in the trunk lines. This coupled with the suspected breach in the system led to the removal action for all interior drains and piping. In 2000, all floor drain piping and structures associated with the two floor drain systems were removed up to the OWS that was located at the western end of Hangar 1 (Foster Wheeler Environmental, 2001b).

Confirmatory samples collected from the base of the trench beneath the former floor drain systems had concentrations of extractable petroleum hydrocarbons (EPH), semi-volatile organic compounds (SVOCs), PCBs, and naphthalene greater than Massachusetts Contingency Plan (MCP) reportable concentrations (RCS-1) at several locations. A TCRA was implemented in August and September 2000; soils were removed at the locations where PCB and naphthalene exceedances were detected during confirmatory sampling (Foster Wheeler Environmental, 2001c). Soil was excavated to a depth of 2 feet below the existing trench floor and approximately 10 feet in each lateral direction during each excavation round. A total of 104.58 tons of contaminated soil were removed and transported off site for disposal. Based on confirmatory sampling after soil removal, no analytes were detected in excess of the MCP RCS-1 standards, and no further soil removal was required (Stone & Webster, 2004a). The excavations were backfilled with clean soil.

Groundwater levels at AOC Hangar 1 range from approximately 7 to 8 feet below ground surface, and groundwater flow is generally toward the south-southwest (Stone & Webster, 2004b). Analytical results for groundwater samples collected in 2002 from three monitoring wells at the AOC Hangar 1 area indicated that concentrations of analytes were consistent with base background conditions. No further

action with respect to groundwater is recommended for this site because no site-related impact to groundwater was identified.

2.6 CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

NAS South Weymouth was operationally closed on September 30, 1996, and administratively closed on September 30, 1997. The former base is surrounded by residential/light commercial areas. Under current use of the former NAS South Weymouth, there are no activities occurring at AOC Hangar 1 and thus there is no potential for current worker exposure.

The anticipated future use of the AOC Hangar 1 property is based on the zoning prescribed in the Zoning and Land Use By-Laws for the Naval Air Station South Weymouth (SSTTDC, 2005a), which has been approved by the Towns of Weymouth, Abington, and Rockland. AOC Hangar 1 is located in an area zoned as a "Village Center District" and also borders a "residential district." The Village Center District zone is mixed-use with housing, offices, and commercial and retail uses (SSTTDC, 2005b).

Groundwater at AOC Hangar 1 is not within a state-mapped potentially productive aquifer zone, interim wellhead protection area, or Zone II area. Therefore, groundwater at AOC Hangar 1 is not considered to be part of a Potential Drinking Water Source Area.

2.7 SUMMARY OF POTENTIAL SITE RISKS

A baseline risk assessment estimates the potential risks from a site to human and/or ecological receptors if no actions are taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by any remedial action. An ecological risk assessment was not required for AOC Hangar 1 because there is no suitable habitat at the site for ecological receptors and thus there is an incomplete ecological exposure pathway (TtNUS, 2009). The Navy conducted a streamlined HHRA for Hangar 1 in 2009 to determine whether detected concentrations of chemicals in post-excavation confirmatory subsurface soil samples and groundwater samples pose a significant threat to human receptors. The HHRA was conducted in accordance with the Streamlined Human Health Risk Assessment Work Plan (EA, 2001). A conservative subset of baseline risk assessment exposure scenarios was used for the streamlined risk assessment, and predicted effects were then considered when making decisions for AOC Hangar 1.

2.7.1 Summary of Human Health Risk

The streamlined HHRA was conducted using chemical data for soil samples collected between March and September of 2000 and groundwater samples collected in November 2002. The four key steps in the risk assessment process included: (1) identification of chemicals of potential concern (COPCs), (2) exposure assessment, (3) toxicity assessment, and (4) risk characterization. Tables summarizing data used in the HHRA and associated results are presented in Appendix C.

Identification of COPCs

COPCs were identified as those analytes with detected concentrations exceeding EPA Regional Screening Levels (RSLs) for residential soil and tap water (EPA, 2009) and exceeding Base background levels, where applicable. In addition, EPA generic Soil Screening Levels (SSLs) for the inhalation of volatiles and fugitive dusts in residential soil, EPA SSLs for the protection of groundwater, and Safe Drinking Water Act Maximum Contaminant Levels (MCLs) were also used for COPC selection. The maximum detected concentration of each chemical in subsurface soil and groundwater at the site was compared to the appropriate risk-based screening criteria. Analytes present at concentrations greater than screening levels but less than applicable Base background levels were eliminated as COPCs. The selected COPCs were used for site-specific risk calculations (i.e., Steps 2 through 4 described below).

Human health COPCs initially identified for direct contact with subsurface soil and/or migration to groundwater included the following (maximum contaminant values in parentheses): the volatile organic

compounds, m+p-xylene (0.29 µg/kg), o-xylene (0.13 µg/kg); the PAHs, benzo(a)anthracene (1.6 mg/kg), benzo(a)pyrene (1.2 mg/kg), benzo(b)fluoranthene (1.7 mg/kg), benzo(k)fluoranthene (0.72 mg/kg), chrysene (1.5 mg/kg), indeno(1,2,3-cd)pyrene (0.64 mg/kg), and naphthalene (39 µg/kg); the PCB Aroclor-1254 (1.4 mg/kg); and the metals cadmium (1.5 mg/kg), lead (28 mg/kg), and manganese (180 mg/kg). Other COPCs identified for direct contact with or inhalation from groundwater included chloroform (1.3 µg/L), trichloroethene (0.18 µg/L), and manganese (620 µg/L). These post-removal concentrations did not exceed the MCP Method 1 soil or groundwater standards.

The concentrations of the carcinogenic PAHs identified above were converted to benzo(a)pyrene (BAP) equivalents for the SVOC and EPH fractions, and the list of COPCs was further refined. Exposure point concentrations (EPCs) were then calculated for the chemicals retained as COPCs in subsurface soil and groundwater (Appendix C, Tables C-1 and C-2). These EPCs were used to calculate the risks to adult and child residents from exposure to COPCs in soil and groundwater via the listed exposure routes.

Exposure Assessment

The exposure assessment examines possible pathways by which humans may contact the COPCs based on current and future land use scenarios. The Navy evaluated an on-site residential scenario (the most conservative) for current and future use. Because exposure parameters are more conservative for the residential scenario, this scenario is also protective of any potential trespassers, recreational users, and construction or industrial workers. For AOC Hangar 1, the HHRA evaluated direct contact with (and ingestion of) subsurface soil and groundwater, as well as inhalation of volatile compounds detected in the groundwater (see Table 2-2).

TABLE 2-2. RECEPTORS AND EXPOSURE ROUTES EVALUATED IN HHRA	
RECEPTORS	EXPOSURE ROUTES
Future Residents (Adults/Children)	Dermal contact (soil and groundwater) Ingestion (soil and groundwater) Inhalation of volatiles (groundwater and vapor intrusion from groundwater into indoor air)

The EPCs were calculated based on the reasonable maximum exposure (RME) assumption of risks to the residential receptor. Generally, the 95 percent upper confidence limit (UCL) on the mean is selected as the RME EPC (TiNUS, 2009) and is calculated using EPA's ProUCL software. For most soil COPCs, the EPCs were the calculated 95 percent UCLs, while the maximum concentrations were used as the EPCs for groundwater COPCs and for the BAP equivalents in the EPH fraction, in accordance with EPA guidance (TiNUS, 2009). The EPCs for soil and groundwater are listed in Appendix Tables C-1 and C-2, respectively.

Toxicity Assessment

Toxicity assessment involves identifying the types of adverse health effects caused by exposure to site COPCs and determining the relationship between the magnitude and type of exposure and the severity or probability of human health effects (i.e., dose-response relationship) for each COPC. The possible harmful effects to humans from 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). Based on the quantitative dose-response relationships determined, toxicity values for both cancer (cancer slope factor [CSF]) and non-cancer (reference dose [RfD]) effects were derived and used to estimate the potential for adverse health effects.

Appendix C Tables C-3 and C-4, provide carcinogenic risk information for oral and dermal exposure and for inhalation exposure, respectively, for the AOC Hangar 1 COPCs. CSFs are specific to a chemical and route of exposure and are expressed in units of (mg/kg/day)⁻¹. At this time, CSFs are not available for the dermal route of exposure; therefore, dermal slope factors were extrapolated from oral values. Dermal CSFs were derived by dividing the corresponding oral values by the gastrointestinal absorption efficiency. An adjustment factor is sometimes applied to extrapolate the dermal values from oral values, dependent on how well the chemical is absorbed via the oral route. No adjustment factor was required for the listed

carcinogenic COPCs because the absorption efficiency was 1.0 for each. The oral CSF was therefore used as the dermal CSF.

Tables C-5 and C-6 provide non-carcinogenic hazard information for AOC Hangar 1 COPCs for oral/dermal and inhalation routes of exposure, respectively. The chronic toxicity data available for oral exposure to the COPCs were used to develop oral RfDs (expressed in units of mg/kg/day). The available toxicity data indicate that chloroform primarily affects the liver, PCBs affect the immune system, and manganese primarily affects the central nervous system. As with the carcinogenic data, dermal RfDs are not available but can be extrapolated from oral RfDs by multiplying the corresponding oral values by the gastrointestinal absorption efficiency. For manganese, an absorption efficiency of 0.04 was applied to the oral RfD to estimate the dermal RfD. No adjustment was necessary for chloroform or PCBs because their absorption efficiency was 1.0.

Risk Characterization

During the risk characterization, the results from the exposure and toxicity assessments were combined to calculate the overall risks (cancer risks and non-cancer hazards) from exposure to site COPCs. Potential cancer risks and non-cancer hazards were calculated based on RME assumptions. The RME scenario assumes the maximum level of human exposure that could reasonably be expected to occur, and therefore represents a “reasonable worst case” exposure scenario. Tables C-7 through C-9 show the RME cancer risk estimates and non-cancer hazard indices that were calculated for adult, child, and lifelong residents exposed to subsurface soil and groundwater for each COPC and each route of exposure.

For carcinogens, risks are generally expressed as the probability of an individual developing cancer over an estimated lifetime of 70 years, as a result of exposure to the carcinogen. EPA’s acceptable risk range for carcinogens is from 1 in 1 million to 1 in 10,000 (10⁻⁴ to 10⁻⁶). For non-carcinogens, the risk to human health is expressed as a Hazard Index (HI). An HI greater than 1.0 suggests that adverse health effects are possible. Table 2-3 provides a summary of the calculated overall risks for AOC Hangar 1.

TABLE 2-3. SUMMARY OF HAZARD INDICES AND CANCER RISKS				
Exposure Scenario			Results	
			Hazard Index	Cancer Risk
Future Residents	Adult	Subsurface soil	0.02	1E-5
		Groundwater	0.8	8E-7
		Total	0.8	1E-5
	Child	Subsurface soil	0.2	6E-5
		Groundwater	3	7E-7
		Total	3	7E-5
	Lifelong	Subsurface soil	NA	8E-5
		Groundwater	NA	1E-6
		Total	NA	8E-5

Under the RME scenario, the HHRA determined that cumulative cancer risks and non-cancer hazards for all potential users exposed to subsurface soil were within EPA's acceptable risk range. The cumulative cancer risks for adult, child, and lifelong residents and the non-cancer hazards for adult residents exposed to groundwater were also within EPA's acceptable risk range. The non-cancer risk for child residents exposed to groundwater exceeds 1, primarily due to the concentration of manganese in groundwater.

Based on these results and as documented in the Final Streamlined HHRA for Hangar 1 (TtNUS, 2009), the Navy and EPA conclude that the site does not pose an unacceptable risk to human health.

2.8 DOCUMENTATION OF NO SIGNIFICANT CHANGES

The Navy issued a Proposed Plan for No Further Action for soils and groundwater at AOC Hangar 1 on March 22, 2010, for a 30-day public comment period (U.S. Navy, 2010). A public information session and public hearing were held on April 8, 2010. The Navy reviewed the comments submitted during the public comment period and at the public hearing (Appendix E). As summarized in the Responsiveness Summary, it was determined that no significant changes to the decision, as originally identified in the Proposed Plan, were necessary. Therefore, No Further Action for soils and groundwater at AOC Hangar 1 will be implemented.

2.9 STATE ROLE

MassDEP has reviewed the relevant site information to determine if the selected decision is in compliance with applicable or relevant and appropriate state environmental and facility siting laws and regulations. MassDEP's concurrence on the selected decision in this ROD is presented in Appendix A.

3.0 RESPONSIVENESS SUMMARY

3.1 STAKEHOLDER COMMENTS AND LEAD AGENCY RESPONSES

Participants in the public meeting held on April 8, 2010, included RAB members and representatives of the Navy, EPA, and MassDEP. Questions and concerns raised at the meeting were addressed at the meeting. Following the public meeting, a public hearing was held. One individual provided comments during the public hearing which were documented in the hearing transcript. One comment letter was received during the comment period. These comments are summarized in Table 3-1 and responses are provided. The public hearing transcript and written comment letter are included in Appendix E.

TABLE 3-1. SUMMARY OF COMMENTS FROM PUBLIC HEARING AND PUBLIC COMMENT PERIOD	
COMMENT	RESPONSE
<p>Mr. Dominic Galluzzo expressed concern about the drainage systems of the motor pool building relative to the drainage systems of Hangar 1. He could not understand how the same Navy policy, implemented at both buildings, resulted in an efficient system of drainage for Hangar 1, and a weak system for the motor pool. He said he would like the Navy to explain this difference.</p>	<p>The motor pool on the Base is also referred to as Building 81. This building was a one-story structure on a concrete slab foundation and had two floor drains, one connected to the sanitary sewer and the other to the storm drain system. The floor drain systems in Building 81 have not been identified as a source of contamination at the site. The source of contamination at Building 81 was a 500-gallon underground storage tank (UST) used for storage of waste oil from vehicle maintenance activities, not the floor drain system.</p> <p>At Hangar 1 however, the floor drain systems were identified as a potential source of contamination during the EBS process. As discussed in Section 2 of this ROD, the floor drain systems were tested, cleaned, and removed and contaminated soils beneath the floor drains were excavated. Post excavation sampling and analysis was performed to confirm that all contaminated soil was excavated and disposed off-site. Groundwater sample results from three monitoring wells installed downgradient of the hangar did not reveal any evidence of impact to groundwater from the Hangar 1 operations. The confirmatory soil sample results and groundwater data were used in a streamlined human health risk assessment (HHRA). Based on the results of the risk assessment as presented in Section 2.7.1 of this ROD, Navy and EPA concluded that the site does not pose an unacceptable risk to human health. Under CERCLA, if no unacceptable risks to human health or the environment are identified, then no further action is required as presented in the Proposed Plan.</p> <p>While the source of contamination at Hangar 1 is the floor drain systems and the source of contamination at Building 81 (motor pool) is the waste oil UST, Navy is following the CERCLA process at both sites.</p>
<p>Ms. Mary Parsons provided a comment letter on AOC Hangar 1 prepared by Cambridge Environmental, Inc., on behalf of Advocates for Rockland Abington Weymouth Hingham (ARAWH). Key points are summarized below.</p>	

<p>1. The no further action proposal is based on a level of risk acceptable for EPA risk assessments but higher than typically allowed under the Massachusetts Contingency Plan (MCP).</p> <p>2. Commenter suggested using institutional controls to restrict groundwater use, as well as a more detailed investigation of whether drinking water resources are potentially affected by elevated manganese levels in groundwater, which resulted in a non-cancer risk estimate (HI = 3) for the child resident that exceeded the target HI of 1.</p> <p>3. Commenter recommended that the MCP risk limit be considered an ARAR, stating that although the cancer risk estimate (8×10^{-5}) for the site is within EPA's allowable risk range, it exceeds the MCP cancer risk limit of 10^{-5}.</p> <p>4. Commenter suggested collection of multiple rounds of seasonal groundwater data to support the risk assessment.</p>	<p>1. As a CERCLA site, the AOC Hangar 1 risk assessment followed a NAS South Weymouth-specific process based on EPA guidance. None of the maximum chemical concentrations detected at Hangar 1 exceed the applicable MCP Method 1 S-1/GW-1 standards, thus indicating that the level of risk is acceptable under the MCP. See response to comment 3 below.</p> <p>2. Although the HHRA evaluated the risks from ingestion of groundwater based on future residential use of the Site, the groundwater at AOC Hangar 1 is not considered to be part of a Potential Drinking Water Source Area and there is no current plan for future use of groundwater at the Base as a drinking water source. The manganese concentration that contributed to the increased non-cancer risk for future child residents is significantly less than concentrations found in other areas, and is within the range of manganese concentrations found in monitoring wells off the Base (ATSDR Public Health Assessment for NAS South Weymouth, 1999). The HHRA concluded that the manganese concentrations in groundwater at Hangar 1 are not site related. Furthermore, the maximum groundwater concentration ($620 \mu\text{g/L}$) is less than the tapwater RSL ($880 \mu\text{g/L}$) and since it is the only non-cancer COPC, it should not be a concern. The general groundwater flow direction in the Hangar 1 area is to the southwest toward the west branch of French Stream which flows south into Rockland. The local drinking water sources are located to the north of the Base. The risk assessment conclusions regarding groundwater exposure were reviewed and accepted by EPA and MassDEP.</p> <p>3. As stated above, the site is regulated under CERCLA, not the MCP. Nevertheless, in the HHRA the post-removal subsurface soil and groundwater maximum concentrations for each detected analyte was also compared to the applicable MCP Method 1 soil and groundwater (S-1/GW-1) standards, which "represent levels of oil or hazardous materials at which no further remedial response actions would be required based upon the risk of harm posed by these chemicals." None of the detected concentrations used in the risk assessment exceed the MCP S1/GW1 standards, as stated in Section 7.9 of the HHRA. This indicates that the No Further Action decision would be acceptable under the MCP if a Method 1 risk assessment using the S-1/GW-1 standards had been conducted and confirms that the estimated risks presented in the streamlined human health risk assessment for AOC Hangar 1 are acceptable.</p> <p>4. Both EPA and MassDEP reviewed and accepted the risk assessment based on the available data. Both agencies have agreed with the No Further Action proposal. Furthermore, it should be noted that the groundwater wells were installed and sampled (2002)</p>
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<p>5. Commenter stated that background data for groundwater seem inappropriate.</p> <p>6. Commenter suggested a more rigorous evaluation of the vapor intrusion pathway.</p>	<p>two years after the source area and contaminated soil were identified and removed (2000). Since the initial sampling results indicated that the groundwater had not been impacted by Site contaminants, no further sampling is deemed necessary.</p> <p>5. The background data set was developed with input from EPA and MassDEP and its use is consistent with established procedures. Table 4 of the HHRA screens the data against the EPA RSLs, not the indicated background concentrations. As noted above, this site is regulated under CERCLA, not the MCP. Note that monitoring well locations MW05 and TT01 are part of the RDA site, not the AOC Hangar 1 site.</p> <p>6. The risk assessment was conducted in accordance with the Streamlined Risk Assessment Work Plan, and was reviewed and accepted by EPA and MassDEP. For this site the evaluation of the vapor intrusion pathway was deemed adequate by the regulators and the modeling results (presented in Appendix E of the HHRA) indicate that this pathway is not expected to contribute significantly to receptor risks at the Site.</p>
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3.2 TECHNICAL AND LEGAL ISSUES

No technical or legal issues associated with the AOC Hangar 1 ROD were identified.

**APPENDIX A: MASSACHUSETTS DEPARTMENT OF
ENVIRONMENTAL PROTECTION LETTER OF CONCURRENCE**

Refer to attached copy.



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

DEVAL L. PATRICK
Governor

IAN A. BOWLES
Secretary

TIMOTHY P. MURRAY
Lieutenant Governor

LAURIE BURT
Commissioner

August 4, 2010

Mr. James T. Owens, Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code: OSRR07-03
Boston, MA 02114-2023

Re: Record of Decision
Area of Concern Hangar 1
Former South Weymouth NAS
MassDEP RTN 4-3002621
August 4, 2010

Dear Mr. Owens:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed the *Record of Decision, Area of Concern Hangar 1 – Main Hangar Floor Drains, Naval Air Station South Weymouth*, dated June 2010. The Record of Decision (ROD) summarizes the results from the investigations conducted during the Environmental Baseline Survey (EBS) and the results from the removal actions that were conducted to address unacceptable risks to human health of the environment, and documents the Navy's rationale for selecting a No Further Action decision for the site. MassDEP concurs with the selected decision.

If you have any questions or comments, please contact David Chaffin, Project Manager (617-348-4005), or Anne Malewicz, Federal Facilities Section Chief (617-292-5659).

Sincerely,

Janine Commerford
Assistant Commissioner

CC: D. Barney, USN-S. Weymouth
K. Keckler, USEPA
Executive Director, SSTTDC
RAB Members
J. Naparstek, MADEP-Boston

APPENDIX B: REFERENCES

EA Engineering, Science, and Technology, 2001. Final Streamlined Human Health Risk Assessment Work Plan: Areas of Concern at NAS South Weymouth. South Weymouth, Massachusetts. Work Order No. 29600.75.0500. March.

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APPENDIX C: HUMAN HEALTH RISK ASSESSMENT SUMMARY TABLES

Refer to attached copy.

**TABLE C-1
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE - SOIL - HANGAR 1
NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS**

Scenario Timeframe: Future Medium: Subsurface Soil Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale ⁽¹⁾
Hangar 1	BAP Equivalent (SVOC)	mg/kg	0.36	1.1 (N)	1.7	1.1	mg/kg	95% KM (Percentile Bootstrap) UCL	ProUCL
	Aroclor-1254	mg/kg	0.13	0.21 (L)	1.4	0.21	mg/kg	95% KM (% Bootstrap) UCL	ProUCL
	BAP Equivalent (EPH)	mg/kg	0.30	1.1 (NP)	1.1	1.1	mg/kg	Maximum Concentration	Only 2 Detections*

For non-detects, sample quantitation limit was used as a proxy concentration; for duplicate sample results, the average value was used in the calculation.

L = Lognormal
N = Normal
NP = Non-parametric

EPH = Extractable petroleum hydrocarbon
SVOC = Semivolatile organic compound

1. Exposure point concentration is the value recommended by USEPA's ProUCL. The maximum detected concentration is used if the recommended UCL is greater than the maximum or if the dataset contains less than 10 samples.

*The maximum concentration was chosen as the EPC because there were only two detections of this parameter (see text).

**TABLE C-2
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE - GROUNDWATER - HANGAR 1
NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS**

Scenario Timeframe: Current/Future Medium: Groundwater Exposure Medium: Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Hangar 1	Chloroform	ug/L	NA ⁽¹⁾	NA ⁽¹⁾	1.3	1.3	ug/L	Maximum Concentration	(2)
	Manganese (water)	ug/L	NA ⁽¹⁾	NA ⁽¹⁾	620	620	ug/L	Maximum Concentration	(2)

For non-detects, sample quantitation limit was used as a proxy concentration; for duplicate sample results, the average value was used in the calculation.

1 - Arithmetic mean and 95% UCL were not calculated because the sample set contained less than 10 samples.

2 - For groundwater, the maximum concentration was used as the EPC (see text).

**TABLE C-3
CANCER TOXICITY DATA -- ORAL/DERMAL - HANGAR 1
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS**

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal ⁽¹⁾	Absorbed Cancer Slope Factor for Dermal ⁽²⁾		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds								
CHLOROFORM	3.1E-02	(mg/kg/day) ⁻¹	1	3.1E-02	(mg/kg/day) ⁻¹	B2 / Probable human carcinogen	IRIS	11/19/2009
Semivolatile Organic Compounds								
BENZO(A)PYRENE EQUIVALENTS ⁽³⁾	7.3E+00	(mg/kg/day) ⁻¹	1	7.3E+00	(mg/kg/day) ⁻¹	B2 / Probable human carcinogen	IRIS	09/10/2009
Pesticides/PCBs								
AROCLOR-1254	2.0E+00	(mg/kg/day) ⁻¹	1	2.0E+00	(mg/kg/day) ⁻¹	B2 / Probable human carcinogen	USEPA(1)	09/1996
Metals								
MANGANESE	NA	NA	NA	NA	NA	D (Not classifiable as to human carcinogenicity)	NA	NA

Notes:

- 1 - USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.
- 2 - Adjusted cancer slope factor for dermal = Oral cancer slope factor / Oral Absorption Efficiency for Dermal.
- 3 - The carcinogenic PAHs are considered to act via the mutagenic mode of action. These chemicals are evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Definitions:

IRIS = Integrated Risk Information System.

NA = Not Available.

USEPA(1) = USEPA, PCBs: Cancer Dose-Response Assessment and Applications to Environmental Mixtures, September 1996, EPA/600/P-96/001F.

**TABLE C-4
CANCER TOXICITY DATA -- INHALATION - HANGAR 1
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS**

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor ⁽¹⁾		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds							
CHLOROFORM	2.3E-05	(ug/m ³) ⁻¹	8.1E-02	(mg/kg/day) ⁻¹	B2 / Probable human carcinogen	IRIS	2/19/2009
TRICHLOROETHENE	2.0E-06	(ug/m ³) ⁻¹	7.0E-03	(mg/kg/day) ⁻¹	NA	ORNL	04/2009
Semivolatile Organic Compounds							
BENZO(A)PYRENE EQUIVALENTS ⁽²⁾	1.1E-03	(ug/m ³) ⁻¹	3.9E+00	(mg/kg/day) ⁻¹	NA	ORNL	04/2009
Pesticides/PCBs							
AROCLOR-1254	5.7E-04	(ug/m ³) ⁻¹	2.0E+00	(mg/kg/day) ⁻¹	B2 / Probable human carcinogen	USEPA(1)	9/1996
Inorganics							
MANGANESE	NA	NA	NA	NA	D / Not classifiable as to human carcinogenicity	IRIS	2/19/2009

Notes:

1 - Inhalation CSF = Unit Risk * 70 kg / 20m³/day.

2 - The carcinogenic PAHs are considered to act via the mutagenic mode of action. These chemicals are evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Definitions:

IRIS = Integrated Risk Information System.

NA = Not Available.

ORNL = Oak Ridge National Laboratory; USEPA Regional Screening Levels for Chemical Contaminants at Superfund Sites, April 2009.

USEPA(1) = USEPA, PCBs: Cancer Dose-Response Assessment and Applications to Environmental Mixtures, September 1996, EPA/600/P-96/001F.

**TABLE C-5
NON-CANCER TOXICITY DATA -- ORAL/DERMAL - HANGAR 1
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS**

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal ⁽¹⁾	Absorbed RfD for Dermal ⁽²⁾		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD: Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds										
CHLOROFORM	Chronic	1.00E-02	mg/kg/day	1	1.0E-02	mg/kg/day	Liver	100	IRIS	11/19/2009
Semivolatile Organic Compounds										
BENZO(A)PYRENE EQUIVALENTS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides/PCBs										
AROCLOR-1254	Chronic	2.00E-05	mg/kg/day	1	2.0E-05	mg/kg/day	Immune	300	IRIS	09/10/2009
Metals										
MANGANESE ⁽³⁾	Chronic	2.40E-02	mg/kg/day	0.04	9.6E-04	mg/kg/day	CNS	1	IRIS	11/19/2009

Notes:

- 1 - U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.
- 2 - Adjusted dermal RfD = Oral RfD x Oral Absorption Efficiency for Dermal.
- 3 - Values are for manganese (water).

Definitions:

IRIS = Integrated Risk Information System
NA = Not Available.

**TABLE C-6
NON-CANCER TOXICITY DATA -- INHALATION - HANGAR 1
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS**

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Extrapolated RfD ⁽¹⁾		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds									
CHLOROFORM	Chronic	9.8E-02	mg/m ³	2.8E-02	(mg/kg/day)	Liver	NA	ORNL	4/1/2009
TRICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds									
BENZO(A)PYRENE EQUIVALENTS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides/PCBs									
AROCLOR-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics									
MANGANESE	Chronic	5.0E-05	mg/m ³	1.4E-05	(mg/kg/day)	CNS	1000/1	IRIS	2/18/2009

Notes:

1 - Extrapolated RfD = RfC *20m³/day / 70 kg

Definitions:

CNS = Central Nervous System

IRIS = Integrated Risk Information System

NA = Not Applicable

ORNL = Oak Ridge National Laboratory, Regional Screening Levels for Chemical Contaminants at Superfund Sites, September 12, 2008.

PPRTV = Provisional Peer Reviewed Toxicity Values

TABLE C-7 RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES - ADULT RESIDENT
NAS SOUTH WEYMOUTH

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Subsurface Soil	Hangar 1	Benzo(a)pyrene Equivalents	7E-06	--	4E-06	--	1E-05	NA Immune	--	--	--	--
			Aroclor-1254	2E-07	--	1E-07	--	3E-07		0.01	--	0.008	0.02
			Chemical Total	7E-06	--	4E-06	--	1E-05		0.01	--	0.008	0.02
	Exposure Point Total						1E-05					0.02	
	Exposure Medium Total						1E-05					0.02	
Medium Total								1E-05				0.02	
Groundwater	Groundwater	Hangar 1	Chloroform	4E-07	--	3E-08	--	4E-07	Liver CNS	0.004	--	0.0003	0.004
			Manganese (water)	--	--	--	--	--		0.7	--	0.09	0.8
			Chemical Total	4E-07	--	3E-08	--	4E-07		0.7	--	0.09	0.8
			Exposure Point Total							4E-07			
	Exposure Medium Total						4E-07				0.8		
	Air	Hangar 1	Chloroform	--	4E-07	--	--	4E-07	Liver NA	--	0.004	--	0.004
			Manganese (water)	--	--	--	--	--		--	--	--	--
			Chemical Total	--	4E-07	--	--	4E-07		--	0.004	--	0.004
			Exposure Point Total							4E-07			
	Exposure Medium Total						4E-07				0.004		
Medium Total								8E-07				0.8	
Receptor Total								Receptor Risk Total	1E-05			Receptor HI Total	0.8

Note:

Inhalation exposures are assumed to be equal to the exposures from ingestion of groundwater.

Total CNS HI	0.8
Total Immune HI	0.02
Total Liver HI	0.007

TABLE C-8 RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES - CHILD RESIDENT
NAS SOUTH WEYMOUTH

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Hangar 1	Benzo(a)pyrene Equivalents	5E-05	--	2E-05	--	6E-05	NA Immune	--	--	--	--
			Aroclor-1254	5E-07	--	2E-07	--	6E-07		0.1	--	0.05	0.2
			Chemical Total	5E-05	--	2E-05	--	6E-05		0.1	--	0.05	0.2
			Exposure Point Total							6E-05			
	Exposure Medium Total						6E-05				0.2		
Medium Total						6E-05				0.2			
Groundwater	Groundwater	Hangar 1	Chloroform	3E-07	--	2E-08	--	4E-07	Liver CNS	0.01	--	0.0007	0.01
			Manganese (water)	--	--	--	--	--		2	--	0.3	3
			Chemical Total	3E-07	--	2E-08	--	4E-07		2	--	0.3	3
			Exposure Point Total							4E-07			
	Exposure Medium Total						4E-07				3		
	Air	Hangar 1	Chloroform	--	3E-07	--	--	3E-07	Liver NA	--	0.01	--	0.01
			Manganese (water)	--	--	--	--	--		--	--	--	--
			Chemical Total	--	3E-07	--	--	3E-07		--	0.01	--	0.01
			Exposure Point Total							3E-07			
	Exposure Medium Total						3E-07				0.01		
Medium Total						7E-07				3			
Receptor Total						Receptor Risk Total	7E-05				Receptor HI Total	3	

Note:

Inhalation exposures are assumed to be equal to the exposures from ingestion of groundwater.

Total CNS HI	3
Total Immune HI	0.2
Total Liver HI	0.03

TABLE C-9 RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES - LIFELONG RESIDENT
NAS SOUTH WEYMOUTH

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Lifelong

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	
Subsurface Soil	Subsurface Soil	Hangar 1	Benzo(a)pyrene Equivalents	5E-05	--	2E-05	--	7E-05	
			Aroclor-1254	7E-07	--	3E-07	--	9E-07	
			Chemical Total	5E-05	--	2E-05	--	8E-05	
		Exposure Point Total							8E-05
		Exposure Medium Total							8E-05
Medium Total								8E-05	
Groundwater	Groundwater	Hangar 1	Chloroform	7E-07	--	5E-08	--	8E-07	
			Manganese (water)	--	--	--	--	--	
			Chemical Total	7E-07	--	5E-08	--	8E-07	
		Exposure Point Total							8E-07
		Exposure Medium Total							8E-07
	Air	Hangar 1	Chloroform	--	7E-07	--	--	7E-07	
			Manganese (water)	--	--	--	--	--	
			Chemical Total	--	7E-07	--	--	7E-07	
		Exposure Point Total							7E-07
		Exposure Medium Total							7E-07
Medium Total								1E-06	
Receptor Total							Receptor Risk Total	8E-05	

Note:

Inhalation exposures are assumed to be equal to the exposures from ingestion of groundwater.

APPENDIX D: ADMINISTRATIVE RECORD INDEX

File No.	Vol.	Document No.	Document Type ^(a)	Document Title	Document Date	Document Author	Document Recipient	Document Location	Area of Concern
1.0 SITE ASSESSMENT									
1.8 Environmental Baseline Survey									
1.8		1.8-1	R	Phase I Environmental Baseline Survey	11/96	Stone & Webster	U.S. Department of the Navy	A.R. File	Basewide
1.8		1.8-2	R	Phase I EBS Report Errata	11/10/97	Stone & Webster	U.S. Department of the Navy	A.R. File	Basewide
1.8		1.8-3	R	Final Phase II Environmental Baseline Survey Field Report Former Naval Air Station South Weymouth, MA Building 1 (Hangar 1)	12/04	Stone & Webster	U.S. Department of the Navy	A.R. File	Hangar 1
1.8		1.8-4	R	Phase II Environmental Baseline Survey Technical Memorandum for AOC Hangar 1, Naval Air Station South Weymouth, MA	12/6/04	Stone & Webster	U.S. Department of the Navy	A.R. File	Hangar 1
1.9 Work Plans									
1.9		1.9-1	R	Final Phase II Environmental Baseline Survey Sampling Work Plan (Rev. 1)	10/13/98	Stone & Webster	U.S. Department of the Navy	A.R. File	Basewide RIAs
1.9		1.9-2	L	Meeting Minutes Streamlined Risk Assessment Process South Weymouth Naval Air Station	9/00	EA Engineering, Science, and Technology	U.S. Department of the Navy	A.R. File	Basewide
1.9		1.9-3	R	Final Streamlined Human Health Risk Assessment Work Plan, Areas of Concern at Naval Air Station South Weymouth, South Weymouth, MA	9/01	EA Engineering, Science, and Technology	U.S. Department of the Navy	A.R. File	4A, 4B, 9B, 53, 55A, 55B, 55C, 60, 84, 101, Hangar 1

APPENDIX D: ADMINISTRATIVE RECORD INDEX (cont.)

File No.	Vol.	Document No.	Document Type ^(a)	Document Title	Document Date	Document Author	Document Recipient	Document Location	Area of Concern
3.0 REMEDIAL INVESTIGATION									
3.2 Sampling and Analysis Data									
3.2		3.2-1	R	Final Summary Report of Background Data Summary Statistics for Naval Air Station South Weymouth	2/24/00	Stone & Webster	U.S. Department of the Navy	A.R. File	Basewide
3.2		3.2-2	R	Errata to the Final Summary Report of Background Data Summary Statistics	3/8/00	Stone & Webster	U.S. Department of the Navy	A.R. File	Basewide
3.2		3.2-3	R	Supplement to Final Summary Report of the Background Data Summary Statistics for NAS South Weymouth	11/08/02	Stone & Webster	U.S. Department of the Navy	A.R. File	Basewide
3.2		3.2-4	R	Hangar 1 (Building 1), 3-Volume Set of Documents Pertaining to Floor Drain System Removals and Associated Soil Removals, Naval Air Station South Weymouth, South Weymouth, Massachusetts	0401	Stone & Webster	U.S. Department of the Navy	A.R. File	Hangar 1
3.6 Remedial Investigation Reports									
3.6		3.6-2	R	Final Streamlined Human Health Risk Assessment, AOC Hangar 1	12/09	TtNUS	U.S. Department of the Navy	A.R. File	Hangar 1

APPENDIX D: ADMINISTRATIVE RECORD INDEX (cont.)

File No.	Vol.	Document No.	Document Type ^(a)	Document Title	Document Date	Document Author	Document Recipient	Document Location	Area of Concern
4.8 Proposed Plans for Selected Remedial Action									
4.8		4.8-1	R	Final Proposed Plan, AOC Hangar 1, Naval Air Station South Weymouth, Weymouth, Massachusetts	03/10	U.S. Department of the Navy	Public	A.R. File	Hangar 1
5.0 RECORD OF DECISION									
5.3 Responsiveness Summaries									
5.3		5.3-1	L	Copy of Public Comments Received on the Proposed Plan for AOC Hangar 1 (included in Appendix E of the Record of Decision)	07/10	Public	U.S. Department of the Navy	A.R. File	Hangar 1
5.3		5.3-2	R	Transcript of the Public Hearing on the Proposed Plan for AOC Hangar 1 (included in Appendix E of the Record of Decision)	4/10	Public	U.S. Department of the Navy	A.R. File	Hangar 1
5.3		5.3-3	R	Responsiveness Summary (included as Part 3 of the Record of Decision)	07/10	U.S. Department of the Navy	Public	A.R. File	Hangar 1
5.4 Record of Decision									
5.4		5.4-1	R	Record of Decision, Area of Concern Hangar 1 Main Hangar Floor Drains, Naval Air Station South Weymouth, Massachusetts	07/10	U.S. Department of the Navy and EPA	Public	A.R. File	Hangar 1
10.0 ENFORCEMENT/NEGOTIATION									
10.16 Federal Facility Agreements									
10.16		10.16-1	L	Federal Facility Agreement for South Weymouth Naval Air Station National Priorities List Site	4/00	EPA	U.S. Department of the Navy	A.R. File	Basewide
13.0 COMMUNITY RELATIONS									
13.2 Community Relations Plan									
13.2		13.2-1	R	Community Relations Plan Naval Air Station South Weymouth, Massachusetts	7/98	U.S. Department of the Navy	Public	A.R. File	Basewide

APPENDIX D: ADMINISTRATIVE RECORD INDEX (cont.)

File No.	Vol.	Document No.	Document Type ^(a)	Document Title	Document Date	Document Author	Document Recipient	Document Location	Area of Concern
13.4 Public Meetings/Hearings									
13.4		13.4-1		Restoration Advisory Board Workshop Guidebook	7/94	EPA	Public	A.R. File	Basewide
13.4		13.4-2		Legal Notice: Availability of the Proposed Plan, and Notification of Public Meeting and Comment Period	03/10	Tetra Tech NUS	Public	A.R. File	Hangar 1
13.4		13.4-3		Public Notice: Notification of Restoration Advisory Board Meetings	1995-2010	Tetra Tech NUS and EA Engineering, Science, and Technology	Public	A.R. File	Basewide
13.4		13.4-4		Restoration Advisory Board Meeting Minutes	1995-2010	U.S. Department of the Navy	Public	A.R. File	Basewide
13.4		13.4-5		Legal Notice, Record of Decision Available For AOC Hangar 1	8/10	Tetra Tech NUS	Public	A.R. File	Hangar 1
13.5 Fact Sheets/Information Updates									
13.5		13.5-1	R	The Former Naval Air Station South Weymouth Environmental Fact Sheet	2/98	EA Engineering, Science, and Technology	Public	A.R. File	Basewide
13.6 Mailing Lists									
13.6		13.6-1		Community Relations Mailing List: State, Federal and Local Agencies (including Media and Public Libraries)	N/A	U.S. Department of the Navy	N/A	A.R. File	Basewide
13.6		13.6-2		Community Relations Mailing List: Other Parties (e.g., general public) – CONFIDENTIAL (due to potential Privacy Act violations)	N/A	U.S. Department of the Navy	N/A	A.R. File	Basewide

APPENDIX D: ADMINISTRATIVE RECORD INDEX (cont.)

File No.	Vol.	Document No.	Document Type ^(a)	Document Title	Document Date	Document Author	Document Recipient	Document Location	Area of Concern
17.0 SITE MANAGEMENT RECORDS									
17.6 Site Management Plans and Reviews									
17.6		17.6-1	R	Site Management Plan Naval Air Station South Weymouth, Massachusetts	10/99	EA Engineering, Science, and Technology	U.S. Department of the Navy	A.R. File	IR Sites
17.6		17.6-2	R	Site Management Plan Revision 1.0 Naval Air Station South Weymouth, Massachusetts	10/00	EA Engineering, Science, and Technology	U.S. Department of the Navy	A.R. File	IR Sites
17.6		17.6-3	R	Site Management Plan Revision 2.0 Naval Air Station Weymouth, Massachusetts	11/01	EA Engineering, Science, and Technology	U.S. Department of the Navy	A.R. File	IR Sites
17.6		17.6-4	R	Site Management Plan Revision 3.0 Naval Air Station South Weymouth, Massachusetts	4/03	EA Engineering, Science, and Technology	U.S. Department of the Navy	A.R. File	IR Sites
17.6		17.6-5	R	Site Management Plan Revision 4.0 Naval Air Station South Weymouth, Massachusetts	12/04	EA Engineering, Science, and Technology	U.S. Department of the Navy	A.R. File	IR Sites
17.6		17.6-6	R	Draft Site Management Plan Revision 5.0 Naval Air Station South Weymouth, Massachusetts	8/05	Tetra Tech NUS	U.S. Department of the Navy	A.R. File	IR Sites
17.6		17.6-7	R	Site Management Plan Revision 6.0 Naval Air Station South Weymouth, Massachusetts	10/31/06	Tetra Tech NUS	U.S. Department of the Navy	A.R. File	IR Sites
17.6		17.6-8	R	Site Management Plan Revision 7.0 Naval Air Station South Weymouth, Massachusetts	09/07	Tetra Tech NUS	U.S. Department of the Navy	A.R. File	IR Sites
17.6		17.6-9	R	Draft Site Management Plan Revision 8.0 Naval Air Station South Weymouth, Massachusetts	09/08	Tetra Tech NUS	U.S. Department of the Navy	A.R. File	IR and AOC Sites
17.6		17.6-10	R	Site Management Plan Revision 9.0 Naval Air Station South Weymouth, Massachusetts	11/09	Tetra Tech NUS	U.S. Department of the Navy	A.R. File	IR and AOC Sites

(a) R = Report; L = Letter.

NOTES:

- | | | | | | |
|-----------|---|---|---------|---|--|
| AOC | = | Area of Concern | N/A | = | Not Applicable |
| A.R. File | = | Administrative Record File | NAS | = | Naval Air Station |
| EBS | = | Environmental Baseline Survey | RIA | = | Review Item Area |
| EPA | = | (U.S.) Environmental Protection Agency (Region 1) | MassDEP | = | Massachusetts Department of Environmental Protection |

**APPENDIX E. TRANSCRIPT OF PUBLIC HEARING AND COMMENT LETTER
RECEIVED ON THE PROPOSED PLAN FOR AOC HANGAR 1**

Refer to attached copies.

Proposed Plan
Area of Concern Hangar 1 (Main Hangar Floor Drains)
Operable Unit 25
Naval Air Station South Weymouth
Weymouth, Massachusetts

Public Hearing
New England Wildlife Center
Weymouth, MA

April 8, 2010
Thursday, 8 p.m.

Leavitt Reporting, Inc.

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Weymouth, MA 02188
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Tel. 781-335-6791
Fax: 781-335-7911
leavittreporting@comcast.net

Hearings ♦ Conferences ♦ Legal Proceedings

1 (The Public Hearing commenced at 8 p.m.
2 at the New England Wildlife Center, 500 Columbian
3 Street, Weymouth, MA.)

4 MR. BARNEY: We'll open up the public
5 hearing part of tonight's activity. My name is
6 David Barney. I'm the environmental coordinator for
7 the Naval Air Station of South Weymouth.

8 Tonight we are opening up for any
9 public comments people would like to make on the
10 Navy's Proposed Plan for the Area of Concern of
11 Hangar 1, specifically the Main Hangar Floor Drains
12 and the project that we titled Operable Unit 25.

13 We're in the middle of a comment
14 period, a public comment period that runs from
15 March 23 to April 22nd. That date can be extended
16 if anybody requires further time to make a
17 reasonable review of the information that is in
18 front of them.

19 With that I will open up the floor for
20 anybody who would like to make any comments orally
21 for the record. We'll also accept written comments
22 either via email or regular mail. Thank you.

23 MR. GALLUZZO: I would like for the

1 record to show that there is a concern regarding the
2 drainage systems of the motor pool buildings
3 compared to the drainage systems of the hangar. It
4 is a difficult set of circumstances that we know
5 that the motor pool buildings' drainage systems were
6 not nearly as efficient as what the Navy has found
7 to be true in the hangar.

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1 The Navy policy, Navy standards I
2 believe are at the highest level, and I don't
3 understand how a policy that would allow motor pool
4 drainage systems to be as weak as they are while the
5 drainage systems in the hangar are as efficient as
6 they are. I would hope that the Navy could explain
7 that at a later date and/or address it. Thank you.

8 MR. BARNEY: Okay. I will go ahead and
9 close it out, and also let folks know that if they
10 do have any questions, you can call me or issue me
11 an email, and we'll try to answer anything that we
12 can, and if you do that we'll go ahead and put it in
13 the record, and it will become part of the record.
14 Thank you.

15 (The proceedings adjourned
16 at 8:07 p.m.)

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C E R T I F I C A T E

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I Carol DiFazio, Register Professional Reporter hereby certify that the foregoing 4 pages contain a full, true and correct transcription of all my stenographic notes to the best of my ability taken in the above-captioned matter at said time and place.



Carol DiFazio
Registered Professional Reporter

MEMORANDUM

To: Advocates for Rockland Abington Weymouth Hingham (ARAWH)
From: Stephen G. Zemba, Ph.D., P.E. and Richard R. Lester
Subject: Comments regarding Area of Concern (AOC) Hangar 1
Date: April 21, 2010

We write to suggest possible comments to EPA regarding Area of Concern Hangar 1 at the South Weymouth Naval Air Station. Overall, the risk assessment is conducted according to applicable guidance and methods. Some of the conclusions of the risk assessment, however, are uncertain because of insufficient data collection, and the no further action proposed for the Hangar 1 AOC is based on a level of risk that, while acceptable under federal guidelines, is higher than that typically allowed under the Massachusetts Contingency Plan.

Our specific technical comments follow. Please do not hesitate to write or call us with questions or for further details.

- The non-cancer health risk estimate of 3 for the child resident exposed to groundwater exceeds the target allowable criterion of 1. The exposure pathway of potential concern is manganese in drinking water. The fact that the manganese concentration is lower than the background level does not mean that the risk level is acceptable and that the water is suitable for consumption and use. In fact, if the background level is four times greater, the implied child hazard index for the child exceeds a value of ten. Development of the site, and perhaps the base as a whole, should restrict use of groundwater through institutional controls or other appropriate means. There should also be a more detailed investigation of whether drinking water resources are potentially affected by the elevated manganese levels in groundwater.
- The incremental cancer risk estimate of 8×10^{-5} is within the allowable risk range of 10^{-6} to 10^{-4} for the Superfund program, but the value is near the upper end of the permissible range and is eight times higher than the Massachusetts Contingency Plan (MCP) risk limit of 10^{-5} . If the site was evaluated under the MCP, additional remediation or institutional controls would be necessary to achieve a lower level of potential risk. We recommend the MCP limit be considered as an ARAR.
- Groundwater exposure pathways are based on data from a single sampling round in 2002. These data are too old for use in the risk assessment as site conditions may have changed dramatically. New groundwater sampling data should be collected to support the risk assessment, including sampling over multiple seasons.

- Background data for groundwater seem inappropriate. Issues associated with background monitoring well locations MW05 and TT01 are noted in the July 2009 Five Year Review Report. Organic chemicals such as chloroform and trichloroethene (Table 4 of the risk assessment) should not be present as background constituents in groundwater – these indicate either basewide groundwater contamination or the influence of specific sources of contaminants upgradient of the background monitoring wells. Levels of 4.9 mg/l and 0.62 mg/l for iron and manganese, respectively, are consistent with groundwater subject to anoxic conditions that has leached these minerals from rock. The 0.62 mg/l concentration of manganese exceeds the federal lifetime health advisory of 0.3 mg/l (EPA, 2009). These levels also are more than ten times greater than secondary Massachusetts Maximum Contaminant Levels (potential ARARs) of 0.3 mg/l and 0.05 mg/l for iron and manganese, respectively (DEP, 1997). These values suggest that groundwater is not likely to be suitable for water consumption and use, and its use will either require treatment or should be restricted in future site development.
- Evaluation of the vapor intrusion pathway is far less rigorous than current practice and is not an adequate demonstration of insignificant risk. EPA has found that screening-level use of groundwater-based Johnson and Ettinger modeling underpredicts vapor intrusion in many situations. Current vapor intrusion evaluations require multiple lines of evidence – usually involving the collection of several types of data that support a conceptual site model. In the case of Hangar 1, detection of TCE in a monitoring well is consistent with a release of the chemical as it may have leaked through the floor drains into subsurface soils and percolated through to the groundwater table. If so, TCE may exist both in soils and groundwater beneath the Hangar 1 floor. More importantly, it may also be present in soil-gas, which serves as the transport medium for vapor intrusion. The current presence of the concrete slab in Hangar 1 provides an opportunity for sub-slab sampling of soil-gas that would provide relevant data for assessing the potential importance of the vapor intrusion with respect to future development, which in turn is necessary for ensuring the use of proper mitigation measures and institutional controls (if necessary). It would also be prudent to install and sample monitoring wells beneath the Hangar 1 slab to look for residual evidence of a release from the floor drain system. Other types of data may be necessary as well to determine the significance of the vapor intrusion pathway in accordance with an appropriate conceptual site model backed by sufficient lines of evidence.

ARAWH
Page 3
April 21, 2010

References:

DEP (1997). *Update to the May 1997 Massachusetts Drinking Water Standards and Guidelines for Chemicals in Massachusetts Drinking Waters*. Boston, MA: Office of Research and Standards, Massachusetts Department of Environmental Protection.

EPA (2009). *2009 Edition of the Drinking Water Standards and Health Advisories*. Washington, DC: Office of Water, U.S. Environmental Protection Agency. EPA 822-R-09-011.



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