Final Five-Year Review Report For Bay Head Road Annex IR Program Site 1

Former Naval Surface Warfare Center Carderock Division Annapolis Detachment Annapolis, Maryland



Naval Facilities Engineering Command Washington Contract Number N40080-12-D-0451 Contract Task Order 006

February 2015

#### **DRAFT FIVE-YEAR REVIEW REPORT**

for

Bay Head Road Annex IR Program Site 1

## FORMER NAVAL SURFACE WARFARE CENTER CARDEROCK DIVISION ANNAPOLIS DETACHMENT ANNAPOLIS, MARYLAND

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#### LIST OF ACRONYMS

AFFF	Aqueous Film Forming Foam						
AOC	Area of Concern						
ARAR	Applicable or Relevant and Appropriate Requirements						
BRAC	Base Realignment and Closure						
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act						
CFR	Code of Federal Regulations						
COPC	Contaminants of Potential Concern						
CSF	Cancer Slope Factor						
СТА	Children's Theatre of Annapolis						
DDD	Dichloro-diphenyl-dichloroethane						
DDE	Dichloro-diphenyl-dichloroethylene						
DDT	Dichloro-diphenyl-trichloroethane						
DOD	Department of Defense						
EBS	Environmental Baseline Survey						
EPA	U.S. Environmental Protection Agency						
ERC	Ecological Risk Characterization						
FOST	Finding of Suitability to Transfer						
HHRA	Human Health Risk Assessment						
HI	Hazard Index						
H&S	H&S Environmental, Inc.						
HQ	Hazard Quotient						
IR	Installation Restoration						
JMWA	J.M. Waller Associates, Inc.						
MDE	Maryland Department of the Environment						
msl	mean sea level						
NAVFAC	Naval Facilities Engineering Command						
Navy	Department of the Navy						
NCP	National Oil and Hazardous Substances Pollution Contingency Plan						
NSWC	Naval Surface Warfare Center						
PA	Preliminary Assessment						
PAH	Polycyclic Aromatic Hydrocarbon						
PCB	Polychlorinated Biphenyl						
PFBS	perfluorobutanesulfonic acid						
PFCs	perfluorinated compounds						
PFHpA	perfluoroheptanoic acid						
PFHxS	perfluorohexanesulfonic acid						
PFNA	perfluorononanoic acid						
PFOA	perfluorooctanoic acid						
PFOS	perfluorooctanesulfonic acid						
RAO	Remedial Action Objective						
RBC	Risk-Based Concentration						
RfD	Reference Dose Factor						
RI	Remedial Investigation						

Rev. 0 12/18/14

ROD	Record of Decision
RPM	Remedial Project Manager
SI	Site Inspection
μg/L	micrograms per liter
USGS	U.S. Geological Survey

# Navy Five-Year Review Signature Cover Key Review Information

SITE IDENTI	SITE IDENTIFICATION					
Site name: Bay Head Road Annex, IR Program Site 1, Former Naval Surface Warfare Center – Carderock Division, Annapolis Detachment						
<b>EPA ID:</b> MD 317	0000167					
Region: 3     State: MD     City/County: Annapolis/Anne Arundel County						
SITE STATUS						
NPL status: Not o	on the NPL					
Remediation statu	is (choose all that ap	oply):	Complete (Institutional controls)			
Multiple Operatio	onal Units?: No		Number of Sites/OUs: 1/Not Applicable			
Construction com	pletion date: Not	Applic	able			
Fund/PRP/Federa	l Facility Lead:		Lead Agency: Department of the Navy,			
Federal Facility			Naval Facilities Engineering Command Washington			
Has site been put	into reuse?: Yes					
<b>REVIEW STA</b>	TUS					
Who conducted the Washington	ne review (EPA Re	egion, S	State, Federal Agency): Naval Facilities Engineering Command			
Author name: David Steckler Author title: Remedial Project Manager						
Author affiliation	: Department of th	e Navy	v, Naval Facilities Engineering Command Washington			
<b>Review period:</b> M	Iarch 2010 – Marc	h 2015				
Date(s) of site inspection: September 23, 2014						
Highlight: Statutory						
Policy type: Ongoing						
Review number: 3						
Triggering action: Signing of Previous Five-Year Review Report						
Triggering action date: March 4, 2010						
Due date (five years after triggering action date): March 4, 2015						

### **Five-Year Review Summary Form**

**Issues:** 

None.

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

None.

#### **Protectiveness Statement(s):**

The remedy of institutional controls (deed restriction; residential use prohibited) for the former Bay Head Road Annex is protective of human health and the environment. The remedy is functioning as intended. The current and expected future land use as a public park is consistent with the institutional controls established for the site. The exposure assumptions and toxicity data used at the time of the final remedy selection are still valid. No other information has been identified that could call into question the protectiveness of the final remedy.

#### **Other Comments:**

None.

#### **Next Review:**

The next Five-Year Review for the former Bay Head Road Annex will be completed within five years of the signature date of this report.

#### Signature of U.S. Department of the Navy and Date:

au A Paul Burgio

Base Environmental Coordinator BRAC Program Office

Date 2/12/15

#### **EXECUTIVE SUMMARY**

This document presents the findings of the Third Five-Year Review Report for the Installation Restoration (IR) Site 1, Bay Head Road Annex, Naval Surface Warfare Center (NSWC) – Carderock Division, Annapolis Detachment located in Anne Arundel County in Annapolis, Maryland. The final remedy for the site consisted of an institutional control in the form of a deed restriction which prohibited permanent residential land use in order to protect human health.

The remedy of institutional controls (deed restriction prohibiting residential use) for the former Bay Head Road Annex is protective of human health and the environment. The remedy is functioning as intended. The current and expected future land use as a public park is consistent with the institutional controls established for the site. The exposure assumptions and toxicity data used at the time of the final remedy selection are still valid. No other information has been identified that could call into question the protectiveness of the final remedy. This page intentionally left blank.

#### **1.0 INTRODUCTION**

This document presents the results of the third Five-Year Review Report, undertaken to determine whether or not the final remedy at the former Bay Head Road Annex, IR Site 1, NSWC – Carderock Division, Annapolis Detachment, Annapolis, Maryland is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review Reports.

The Navy prepared this Five-Year Review Report pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section 104 or 106, the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The United States (U.S.) Environmental Protection Agency (EPA) clarified this requirement further in the NCP; 40 Code of Federal Regulations (CFR) §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action.

On behalf of Naval Facilities Engineering Command (NAVFAC) Washington, Tetra Tech, Inc. (Tetra Tech) conducted this Five-Year Review in response to Task Order 006 under Contract Number N40080-12-D-0451. Representatives of Tetra Tech and H&S conducted a site inspection on September 23, 2014. This report documents the results of the Five-Year Review process.

This is the third Five-Year Review Report prepared for the former Bay Head Road Annex. The review was conducted in accordance with the EPA *Comprehensive Five-Year Review Guidance* (EPA, 2001) and Navy policy (Department of the Navy, 2001a). A summary of the previous Five-Year Review Report completed for the former NSWC Annapolis is provided below:

• First Five-Year Review Report: Completed by J.M. Waller Associates, Inc. (JMWA) on behalf of NAVFAC Washington in December 2004 (Navy signature on May 24, 2005). The report noted the site-wide deed restriction prohibiting residential land use. The report concluded that the remedy was functioning as intended by the ROD. The report also concluded that the remedy was protective of human health and the environment. Although the report listed three issues as safety hazards found in the site inspection, no issues were identified related to site operations or implementation of identified remedy. The report recommended that the Navy or Anne Arundel County (Maryland) address and fix the three safety issues.

• Second Five-Year Review Report: Completed by Agviq-CH2M Hill on behalf of NAVFAC Washington in December 2009 (Navy signature on March 4, 2010). The report noted the site-wide deed restriction prohibiting residential land use. The report concluded that the remedy was functioning as intended by the ROD. The report also concluded that the remedy was protective of human health and the environment. All three issues identified in the previous Five-Year Review have been corrected or are deemed acceptable.

The triggering action for this statutory review was the signing of the second Five-Year Review Report on March 4, 2010. The review is required because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

#### 2.0 SITE CHRONOLOGY

After World War II, the Army recognized the need for an air defense system capable of engaging high-speed, maneuverable targets. In 1945, the Army initiated a research and development program for the Nike I defensive missile system to protect major metropolitan areas and strategic military installations from aerial attack. During the mid-1950s, the Department of the Army purchased the parcel of land to be used as a Launch Area in the Nike Missile Defense System for the cities of Annapolis and Washington, DC.

The Bay Head Road Annex Launch Area, designated W-26 Nike Battery, was used by the Army for Nike missile defense operations from 1954 until 1969. Maintenance activities by the Army during that sixteen-year period required the storage, handling, and disposal of missile components and propellants as well as solvents, fluids, fuels, and other materials necessary for operations and maintenance. Hazardous materials and waste were commonly generated at Nike missile sites and often disposed of onsite.

Several former Nike missile site structural features remain onsite, including one former missile launching pad and separate fueling, generator, assembly, storage, and wastewater disposal areas. The missile launching pad consists of one concrete structure, approximately seventeen feet deep, which was used to store the missiles.

After Nike Battery deactivation, the Facility was used by the Navy to conduct burn tests to determine heat resistant properties of materials for use onboard Navy ships. Materials were burned in a concrete pit and analyzed for off-gas production and fire hazard potential. The Navy's operations at the Facility ended in the late 1990s. In 1999, the Children's Theatre of Annapolis (CTA) officially became a tenant from the Department of Defense (DOD) and used the former Navy buildings for set construction and storage.

At the time of the site inspection from the First Five-Year Review in March 2004, nearly all of the Facility had been developed, cleared of trees, and only a small portion remained covered in natural vegetation. Facility access was restricted by fencing, though access remained to areas formerly used by the Army and the Navy. Separate areas existed for recreational activities with two baseball fields, a picnic pavilion, and a restroom/locker room located in the southern portion of the Facility. A septic system was located between the ball fields. This septic system, which included drain and leaching fields, served the pavilion between the two baseball fields.

Since the last Five-Year Review, the construction of the main stage building of the children's theater has been completed. These facilities are used at various times throughout the year for performing plays and holding workshops, camps, and auditions. The first demolition of several former Navy buildings began in November 2006. In total, nine buildings, two former missile launching pads, the pavilion, septic field, burn pad, and evaporation pond have all been demolished and/or removed from the property.

Specifically, two former missile launching pads have been covered to form a parking lot for the children's theater. The pavilion between the former baseball fields has been removed. The baseball fields and former septic field have been replaced by three soccer fields. Old fencing

along the western boundary of the property has been replaced by new fencing. The soccer fields began development in Spring 2008 and were completed in September 2008. Permanent light structures were built in April 2009. A children's playground was constructed in April 2010.

The review period for the first Five-Year Review Report began in March 2001 and was completed in May 2005. The date of the Site Inspection was March 22, 2004. The report was completed and officially signed May 24, 2005.

The review period for the second Five-Year Review Report began in May 2005 and was completed in May 2010. The date of the Site Inspection was June 25, 2009. The report was completed and officially signed March 4, 2010.

The review period for this third Five-Year Review Report is from March 2010 to March 2015. The date of the Site Inspection was September 23, 2014. Table 2-1 summarizes the complete site chronology.

#### **TABLE 2-1**

#### CHRONOLOGY OF SITE EVENTS BAY HEAD ROAD ANNEX ANNAPOLIS, MARYLAND

Event	Date
Bay Head Road Annex Launch Area, designated W-26 Nike Battery, was used by the Army for Nike missile defense operations	1954 - 1969
Property transferred from Army to Navy	1971
Navy conducted research related to burn testing	1972 – 1981
Property used as equipment/supply storage facility	1981 – 1985
Two Preliminary Assessment (PA) Reports were prepared for the Navy	1985 and 1990
Navy conducted a Site Inspection (SI) in accordance with the recommendations identified in the 1990 PA	1991
Phase I Environmental Baseline Survey (EBS) was performed	1995
Children's Theatre of Annapolis becomes tenant of property	1999
Remedial Investigation (RI) was performed	2000
Record of Decision (ROD) completed and signed	2001
Finding of Suitability to Transfer (FOST) completed and signed	2001
Facility transferred from the Department of Defense to Anne Arundel County	2004
First Five-Year Review Completed and Signed	
Demolition and removal of former Navy buildings began	2006
Construction of auditorium for the Children's Theatre of Annapolis completed	2008
Three soccer fields installed on property	2008
Permanent light structures installed for soccer fields	2009
Second Five-Year Review Completed and Signed	2010
Construction of a new children's playground and walking/bike path	2010

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#### **3.0 BACKGROUND**

#### **3.1 PHYSICAL CHARACTERISTICS**

The former Bay Head Road Annex site consists of a tract of land approximately twenty-four acres in size, located on the peninsula between the Magothy and Severn Rivers, less than two miles from the Chesapeake Bay. **Figure 3-1** shows the location of the Bay Head Road Annex in relation to the surrounding area. The topographic relief across the property is approximately fifteen feet, ranging from thirteen to twenty-eight feet above mean sea level (msl). The lowest elevations are in the northeast portion of the site, which borders an unnamed tributary to the Little Magothy River. The highest elevations are found in the eastern portion of the property centered on the three former missile magazines. The property is relatively flat but has a gradual decrease in grade to the northeast, coinciding with the unnamed tributary noted above. Two north-trending, shallow, grass-lined swales provide surface water drainage. The western swale encircles the former septic system and drains to the northern property boundary. The eastern swale is less pronounced and discharges both along the eastern and northeastern property boundaries.

The property is underlain by interbedded clay, silt, and sand, identified as the Talbot Formation (Department of the Navy, 2001b). Depth to groundwater varies from 16 feet in the southeast portion of the site to 9 feet in the northwest. Flow is toward the unnamed tributary at an estimated velocity of 0.48 feet per day (Department of the Navy, 2001b).

#### 3.2 LAND AND RESOURCE USE

Residential areas to the north and west surround the former Bay Head Road Annex. U.S. Routes 50 and 301 are located south of the site with undeveloped land, residential areas, and Sandy Point State Park to the east. Current land use at the property is recreational as a public park. There are three soccer fields used by youth athletic teams and permanent lighting structures around the fields. There are no residences on the property, nor are there plans for future residential use. **Figure 3-2** shows a layout of the property using the aerial imagery from 2007. **Figure 3-3** shows the aerial imagery with the property boundaries and several highlighted areas.

There are no permanent water bodies at the site. Surface water runoff from the site is directed to the storm water drainage system with discharge to the drainage basin of the Little Magothy River and ultimately to the Chesapeake Bay.

#### **3.3 BASIS FOR REMEDIAL ACTION**

The need for remedial action at the former Bay Head Road Annex was based on site history, the nature and extent of contamination, and the results of human health and ecological risk assessments. Each of these is discussed in the following sections.

#### **3.3.1** History of Contamination

Two Preliminary Assessment (PA) Reports were prepared for the Facility in 1985 and 1990 by the Navy. The PAs identified potential locations of contamination (e.g., missile assembly building, missile fueling and war heading area, transformer locations, magazine drainage area, septic system, possible disposal areas, etc.). Test results of soil and sediment sampling from the 1985 PA revealed low levels of toluene, a common degreasing solvent, and the pesticide Dichlorodiphenyltrichloroethane (DDT) and its breakdown products Dichloro-diphenyl-dichloroethane (DDD) and Dichloro-diphenyl-dichloroethylene (DDE) in several of the samples collected. The results of the 1985 groundwater sampling revealed low concentrations of oil and grease in one of the two samples collected. The 1990 PA concluded with recommendations for further evaluation in accordance with the Superfund Site Assessment process. Therefore, the former Bay Head Road Annex facility was officially established as IR Site 1, and a Site Inspection (SI) was scheduled under the Navy's IR program.

In 1991, the Navy conducted an SI in accordance with the recommendations identified in the 1990 PA to evaluate potential groundwater, surface water, sediment, and soil contamination. The SI concluded that low levels of inorganic metals and organic contaminants were present in soil, sediment, surface water and groundwater at the site. The analytical results for metals in surface soil samples were compared with published background concentrations, and were reported at levels that did not exceed background ranges established by the U.S. Geological Survey (USGS). The organics, specifically the polycyclic aromatic hydrocarbons (PAHs), were within ranges representative of urban areas; therefore, a Remedial Investigation (RI) was not recommended due to the low concentrations reported, and the lack of an active source of contamination.

A Phase I Environmental Baseline Survey (EBS) was conducted in 1995, as the site was scheduled for closure under the Base Realignment and Closure (BRAC) IV program. The purpose of the Phase I EBS was to assess the existing environmental information related to storage, release, treatment, or disposal of hazardous substances or petroleum products and to document the environmental condition of the property. The septic system located near the center of the site was identified in the EBS as an Area of Concern (AOC) due to the potential introduction of metals from the overflow of a thermal metal coating process used by the Navy. A further assessment was deemed necessary to determine the nature and extent of potential contaminants on site and if current and future exposures to the contaminants posed human and/or ecological risks based on the proposed recreational land use.

An RI was recommended at that time to further assess the septic system and the surrounding environment. The RI consisted of sampling surface and subsurface soil, sediment, and groundwater. An assessment of the inactive septic system was also conducted, including collection of sludge and leaching well soil and water samples. Analytical sample results were compared to the EPA's Region III Risk-Based Concentrations (RBCs) and ecologically-based screening values. RBCs were developed using highly conservative exposure scenarios suggested by the EPA and the best available toxicological data. They represent conditions that are protective of human health. The ecologically-based screening values are designed to be protective of animal organisms.

#### Description of Contamination

A number of preliminary human and ecological chemicals of potential concern (COPCs) were identified in the RI after screening the analytical results against the identified human and ecological risk screening criteria. Organic and inorganic compounds with concentrations that exceeded the human and ecological risk screening criteria were identified as COPCs and the corresponding sample locations were plotted on a site drawing. Since the highest chemical concentrations are typically found closest to the source, sample concentrations were evaluated with respect to location to identify potential source areas.

Consequently, two potential source areas with elevated human and ecological contaminants were identified: the bermed evaporation pond southwest of the former burn pad with PAHs as a concern for humans, and the surface area in the vicinity of soil sample S-5 with pesticides as an ecological concern. Although elevated levels of some metals and PAHs in individual surface soil samples appeared to be greater than background concentrations (indicating they occurred as a result of site-related activities), no additional source areas were identified.

An evaluation of the potential fate and transport of contaminants was conducted by EA Engineering, Science, and Technology, Inc. (EA). Each contaminant was assessed for its potential for future migration by sediment and soil erosion and leaching from soil by precipitation. Contaminant migration was assessed for groundwater, surface water, and air. In summary, it was determined that contaminants could leach from soil and sediment, and surface water and groundwater could transport contaminants offsite. However, potential down gradient groundwater exposures were deemed low due to the low-level concentrations of the contaminants and the relative immobility of metals and pesticides in groundwater. Contaminant transport in air was not considered a significant pathway due to soil cover, soil type, and general high moisture content.

#### 3.3.2 Summary of Site Risks

A Human Health Risk Assessment (HHRA) and Ecological Risk Characterization (ERC) were conducted as part of the RI to assess the human health and ecological risks that could result if the contamination at the site were not remediated. The HHRA was prepared to evaluate the magnitude of potential adverse effects on human health associated with current or future recreational and residential exposures to site-related chemicals. The ERC was conducted to characterize the potential threats to ecological receptors posed by contaminants at the site.

#### Human Health Risks

The site was evaluated for potential risks to people who used the site at the time of the assessment as well as people who may use the site in the future. Cancer and non-cancer risks were calculated based on current and future land use at the site, which is recreational. Potentially exposed population groups for the assessment included recreational users, community gardeners, maintenance workers, construction workers, and adult and child residents. The results of the assessment indicated that there were no unacceptable risks to any of these populations. It should be noted, however, that the residential scenario only included exposure to groundwater and did

not include exposure to soil and sediment. The Navy plans to evaluate potential residential exposure to soil and sediment using an existing data set in future five year reviews.

#### Exposure Assessment

Onsite and offsite recreational users (ages one to five and six to fifteen), community gardeners (children and adults), maintenance workers, construction workers, and adult and child residents (groundwater only) were the potential receptors evaluated in the risk assessment. No unacceptable cancer or non-cancer risks were calculated for the identified receptor populations based on reasonable maximum exposures.

#### Toxicity Assessment

Carcinogenic risk was calculated based on cancer slope factors (CSFs) developed by the EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CSFs are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upper-bound estimate of lifetime cancer risk associated with exposure at that intake level. The "upper-bound" reflects the conservative estimate of the risks calculated from the CSFs. Using this approach makes under-estimates of the actual cancer risk highly unlikely. Cancer potency factors are derived from the results of human epidemiological studies of chronic animal bioassays to which animal-to-human extrapolation and uncertainly factors have been applied. No cancer risks in excess of the EPA identified acceptable range of 10<sup>-4</sup> through 10<sup>-6</sup> were identified for any receptor population evaluated.

The evaluation of non-carcinogenic effects is based on the Hazard Index (HI), which is the summation of the Hazard Quotients (HQs) for individual chemicals. The HQ is a comparison of chemical-specific chronic exposure doses with the corresponding protective doses derived from health criteria. EPA recommends that remedial actions may be warranted for sites where the HI is greater than 1.0. No non-cancer risks with an HI in excess of 1.0 were identified for any receptor population evaluated.

In summary, no unacceptable cancer or non-cancer risks were calculated for the identified receptor populations based on reasonable maximum exposures.

#### Ecological Risk Characterization Results

An ERC conforming to Steps 1 and 2 of the eight-step ecological risk assessment process for Superfund was completed to assess potential risks to ecological receptors from contaminant exposure. These steps included a screening-level problem formulation, ecological effects evaluation, exposure estimate, and risk calculation. The results indicated that ecological screening criteria were exceeded for maximum concentrations of seven metals including aluminum, antimony, cadmium, lead, manganese, silver, and zinc; the polychlorinated biphenyl (PCB) Aroclor 1260; and pesticides 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT. When mean concentrations were used, six chemicals fell below the screening level, indicating that even slightly elevated analyte concentrations were not widespread at the site. Only the concentration of 4,4'-DDT indicated a potential problem. The highest concentration of 2.7 mg/kg was found at

soil sample S-5, but it was an order of magnitude greater than the values at any other location. This indicated a point source problem that increased potential ecological risk. However, the overall ecological risks were minimal because the value only slightly exceeded the potential risk threshold. Also, the affected area in the vicinity of S-5 was small and represented minimal wildlife habitat. Down-gradient samples were collected and DDT concentrations were non-detectable. The RI revealed little evidence of significant DDT transport via surface water, groundwater, or air.

Therefore, based on these conclusions, no unacceptable ecological risk was identified.









#### 4.0 REMEDIAL ACTIONS

The results of the human and ecological risk assessments completed for the Bay Head Road Annex revealed no unacceptable levels of risk based on the identified industrial levels of exposure. A residential risk assessment for soil at Bay Head Road Annex was not evaluated. Given the exposure assumptions developed for the human health risk assessment, the primary remedial action objective was to prevent land use that may permit human exposures greater than those associated with recreational use. Under this remedy, an institutional control as a deed restriction prohibiting future residential development was implemented at the time of property transfer.

The ROD states in Section 9.1 that, "*institutional controls will be implemented to restrict future use of the site to non-residential use. The deed restrictions will be detailed in the FOST.*" The covenant and restriction regarding permanent residential use that was incorporated into the transfer deed from the Finding of Suitability to Transfer (FOST) [Department of the Navy, 2001c] states:

"Covenant and Restriction Regarding Permanent Residential Use:

GRANTEE is prohibited from using PREMISES for permanent residential purposes. GRANTEE hereby covenants, on behalf of itself, its successors, and its assigns, that no permanent residence shall be constructed or otherwise developed on the PREMISES and that no portion of the PREMISES shall be used as a permanent residence." (US Navy, 2001a.)

The institutional controls were verified in the transfer deed. Copies of the deed are on file at the Anne Arundel County Courthouse at the Department of Public Land Records.

The selected remedy protects human health by prohibiting future residential use, thereby limiting human exposure to contaminants present at the site.

The selected remedy is in full compliance with Applicable or Relevant and Appropriate Requirements (ARARs) and provides long-term effectiveness and permanence. The selected remedy poses no risk to the community during its implementation.

In accordance with Section 121 of CERCLA, a ROD was issued for the former Bay Head Road Annex in March 2001, which called for the deed restriction outlined in the FOST. This restriction was recorded into the transfer deed. The remedial action is to be reviewed at least once every five years to re-evaluate site conditions, confirm the presence of institutional controls, and determine the need for further remedial action to protect human health.

### 4.1 SYSTEM OPERATION/OPERATION AND MAINTENANCE

There are no active remediation systems in operation at the former Bay Head Road Annex as the remedy is an institutional control. There have been no operation and maintenance costs incurred to date.

#### 5.0 PROGRESS SINCE THE LAST REVIEW

This is the third Five-year Review Report for the Bay Head Road Annex. Since the last Five-Year Review, there have been minor land development and construction projects. None of these changes have affected the protectiveness of the remedy.

Based on the site inspection from the first Five-Year Review, three access control issues were identified. All three of these issues have either been corrected or deemed acceptable during the second review. Some issues identified during the first five year review were also identified during the site visit for this Five-Year Review. These issues are identified below based on the previous site inspections conducted on March 22, 2004 and June 25, 2009:

- The inspection during the first Five-Year Review noted that "there is an opening in the southern fence line that appears to have been used for human entrance and exit onto the property." The recommended action according to the first Five-Year Review was to fix the hole in the fence. The second Five-Year Review concluded that since access controls were not listed with institutional controls and because the property is now a public park, the hole in the fence was no longer an issue that needs to be addressed. It does not affect the protectiveness of the remedy and therefore is no longer a concern. During the site visit on September 23, 2014 multiple openings in the fence were observed around the eastern, western, and southern portions of the fence line.
- During the 2004 site inspection, "one of the missile magazine hatches over one of the Nike missile underground storage areas was open and was not secured behind a fence on the property. This is a physical hazard to anyone who is already on the property; this would include those who use the children's theater on the property." There was no evidence of this during the 2009 site inspection; however, the hatches were observed to be missing during the 2014 site inspection.
- "A portion of the fence surrounding the former launch area is missing thereby allowing easy access to those who use the children's theater on the property." There was no evidence of this issue during the 2009 site inspection; however, a portion of the fence was missing during the most recent 2014 site visit.

Therefore, there were no issues identified during this Five-Year Review related to site operations or implementation of the remedy for the former Bay Head Road Annex site. Although three issues identified in the previous Five-Year Review have been deemed acceptable, access to the former missile silo area has been compromised and could lead to safety concerns or a potential health hazard if not addressed. **Table 5-1** documents the issues from the last Five-Year Review and the follow-up actions pertaining to them.

#### TABLE 5-1 PROGRESS ON ACTION ITEMS FROM 2005 AND 2009 REPORTS BAY HEAD ROAD ANNEX ANNAPOLIS, MARYLAND

Issues from First Five-Year Review Report, May 2005			Status – June 2009		Status - September 2014		
Issues from Previous Review	Recommendatio ns/Follow-up Actions	Party Responsible	Milestone Date	Affects Protectiveness	Action Taken and Outcome	Affects Protectiveness	Action Taken and Outcome
Hole in fence along southern property boundary	Repair the fence	Navy/Dept of Rec. and Parks	March 2004	No	County is aware of hole in fence, but poses no risk as site is now public park. No further action.	No	County is aware of hole in fence, but poses no risk as site is now public park. No further action.
Hatch covering missile storage area left open	Close and secure hatch	Navy	March 2004	No	Former missile silo has been paved over by parking lot. No further action.	No	It has been noted that this building has access to a basement where there is now standing water.
Piece of fence surrounding former missile launch area missing	Install additional fence	Navy	March 2004	No	Former missile silo has been paved over by parking lot. No further action.	No	Access to this area leads to a building that has a basement. It has been noted that there is now standing water in the basement area of this building.

#### 6.0 FIVE YEAR REVIEW PROCESS

#### 6.1 ADMINISTRATIVE COMPONENTS

The EPA and MDE were notified of the initiation of the Five-Year Review in August 2014. Mr. David Steckler, the Remedial Project Manager (RPM) for NAVFAC Washington, led the Five-Year Review team for the former Bay Head Road Annex site. Ms. Linda Gustafson, RPM for the MDE, participated in the review. Tetra Tech and H&S prepared the review document under contract to the Navy. The components of the review process included the following:

- Community involvement
- Document review
- Data review
- Site inspection
- Interviews
- Five-Year Review report development

#### 6.2 COMMUNITY INVOLVEMENT

A public notice was published in *The Baltimore Sun* newspaper on October 3, 2014 and *The Capital* and *Bowie Blade News* newspapers October 9, 2014 indicating that a Five-Year Review was being conducted at the former Bay Head Road Annex site. The purpose of the public notice was to inform members of the community that the Five-Year Review was being conducted, to provide information on where the documents used for the review can be obtained, and how the community can contribute during the review process. No comments have been received from the public as of November 11, 2014.

Upon completion of the Five-Year Review Report, notices will be sent to the same newspapers indicating that the results of the review are available to the public at the location identified below:

U.S. Naval Academy Environmental Division Attn: Mr. Mathew Klimoski Halligan Hall (Building 181) 181 Wainwright Road Annapolis, MD 21402 Phone: 410-293-1025 Email: mathew.klimoski@navy.mil

#### 6.3 **DOCUMENT REVIEW**

The Five-Year Review included a review of relevant investigation and decision documents. The documents reviewed include the following:

- EA Engineering, Science, and Technology, Inc. 2000. *Remedial Investigation, Naval Surface Warfare Center, Carderock Division-Annapolis Detachment, Bay Head Road Annex, IR Program Site 1, Annapolis, Maryland.* Final prepared for Department of the Navy Engineering Field Activity Chesapeake. January.
- EA Engineering, Science, and Technology, Inc., 2001. Site Inspection Study, David Taylor Research Center, Bay Head Road Annex, Annapolis, Maryland. October.
- Department of the Navy, Engineering Field Activity Chesapeake, 2001. Finding of Suitability to Transfer (FOST) Naval Surface Warfare Center, Carderock Division, Annapolis Detachment, Annapolis, Maryland. May.
- Department of the Navy, Engineering Field Activity Chesapeake, 2001. Record of Decision – Bay Head Road Annex, IR Program Site 1, Former Naval Surface Warfare Center-Carderock Division, Annapolis Detachment, Annapolis, Maryland. March.
- Department of the Navy, Naval Facilities Engineering Command Washington, 2005. Final Five-Year Review for Bay Head Road Annex, IR Program Site 1 – Former Naval Surface Warfare Center, Carderock Division, Annapolis Detachment, Annapolis, Maryland. Completed by J.M Waller Associates. December 2004 (Navy signature May 24, 2005).
- Department of the Navy, Naval Facilities Engineering Command Washington, 2010. Final Five-Year Review for Bay Head Road Annex, IR Program Site 1 – Former Naval Surface Warfare Center, Carderock Division, Annapolis Detachment, Annapolis, Maryland. Completed by J.M Waller Associates. May 2010 (Navy signature March 4, 2010).

#### 6.4 DATA REVIEW

The remedy for the former Bay Head Road Annex involved a deed restriction to prohibit land from residential use. No sampling or monitoring has occurred at the property since the last Five-Year Review conducted in 2010. Therefore, there is no monitoring or sampling data to review for this Five-Year Review. Data reviewed for this review consist of the documents identified in Section 6.4 and the Site Inspection, Interviews, and Public Records review discussed below.

Past environmental reports were reviewed to identify operational history or data suggesting further evaluation of emerging contaminants is warranted for the site. EPA defines an emerging contaminant as a chemical or material characterized by a perceived, potential, or real threat to human health or the environment or by a lack of published health standards (EPA, 2013). A contaminant also may be "emerging" because of the discovery of a new source or a new pathway to humans. Information was identified in operational records indicating an Aqueous Film Forming Foam (AFFF) system was present in a former fire testing area and could have contained

a chemical surfactant identified by the EPA as an emerging contaminant. Further information on emerging contaminants is provided in Section 7.3.

#### 6.5 SITE INSPECTION

Representatives of Tetra Tech and H&S performed an official site inspection of the former Bay Head Road Annex on September 23, 2014. The purpose of the inspection was to assess the protectiveness of the remedy of institutional controls.

The site was being used for recreational purposes as park athletic fields and for the Children's Theater of Annapolis building. There was no evidence of residential buildings or residential activities on the site. Appendix A contains the Site Inspection Checklist. Photographs taken during the site inspection are included in Appendix B.

As discussed in Section 5 and **Table 5-1**, three issues identified in the previous Five-Year Review completed in 2004 were reviewed in 2009 and again during this current site inspection. Based on the site inspection, resolution of two of these issues are still outstanding. The access to the former missile silo area has been compromised and is allowing entry into the area.

Based on the site inspection, no significant issues or deficiencies were identified and no activities were observed that would have violated the institutional controls for the site; however, access to the former missile silo may present a safety concern and potential health risk due to unknown indoor air conditions in the future if not addressed.

#### 6.6 **PUBLIC RECORDS**

Since the last Five-Year Review in 2009, Land Records for Ann Arundel County have been transferred to digital copy for public viewing. The digital land records set was incorporated into the State of Maryland's online land records database, MDLANDREC (<u>www.Mdlandrec.net</u>). The land record volumes (deeds, land use agreements, assignments, etc.) kept by the Clerk of the Circuit Court for Anne Arundel County are maintained and indexed on MDLANDREC.net. A search was performed on MDLANDREC.net for the deeds and associated land use records for the site. On November 7, 2014 the availability of these records was confirmed at the Anne Arundel County Clerk of the Circuit Court office in Annapolis, Maryland.

Transfer of the subject parcels from the United States of America to Anne Arundel County Maryland is recorded in Deed Book 15301, pp. 652-667, dated September 3, 2003. Section 7 of Enclosure 1 to the Deed (Covenants and Restrictions) includes the prohibition of future use of the property for residential purposes. The deed for the transferred property includes a "Notice of Environmental Condition" and incorporates by reference the environmental reports related to the site (e.g., the EBS, ROD, FOST, etc.). However, it should be noted that these environmental reports, incorporated by reference, are not recorded in the county's land records and are not available at the Clerk of the Circuit Court office. The grantee, Anne Arundel County, acknowledged receipt of these records by its executed acceptance of the deed. Any instrument recorded for future transfer of the property would be required to incorporate or reference the original covenant at a minimum, as well as subsequently identified environmental covenants and restrictions, if any.

The institutional control restricting residential land use is currently being implemented.

#### 6.7 INTERVIEWS

As part of the Five-Year Review process, interviews were conducted with six interviewees representing the Navy, EPA, MDE, the Children's Theatre of Annapolis, and the Anne Arundel County Department of Parks and Recreation. **Appendix C** contains the interview list and interview sheets.

No problems were identified by the interviewees related to the implementation of institutional controls (deed restriction for non-residential use). Overall, there has been minimal activity related to this site since the last five-year review; the Navy and MDE indicated they have not received any concerns or complaints regarding the remedy or the site in general. Overall, the interviewees expressed satisfaction with the transfer of the property to Anne Arundel County (Department of Parks and Recreation) with development into a useful recreational area.

#### 7.0 TECHNICAL ASSESSMENT

#### 7.1 QUESTION A

#### IS THE REMEDY FUNCTIONING AS INTENDED BY THE DECISION DOCUMENTS?

The review of documents, site interviews, and the results of the site inspection indicate that the final remedy is functioning as intended by the ROD. The intent of the institutional control implemented is to limit use and development of the property with a deed restriction. There are no signs of residential development of the property. The Anne Arundel County Office of Planning and Zoning has confirmed that this property is designated as recreational. In summary, the institutional controls are functioning as intended in preventing human exposure to any potential site-related contaminants.

#### 7.2 QUESTION B

# ARE THE EXPOSURE ASSUMPTIONS, TOXICITY DATA, CLEAN-UP LEVELS, AND REMEDIAL ACTION OBJECTIVES (RAOs) USED AT THE TIME OF REMEDY SELECTION STILL VALID?

The current and expected future land use for the site is recreational (Bay Head Park). Human health risks were previously estimated in the 2000 Remedial Investigation for the following receptors for both surface soil and total soil (surface and subsurface soil) media: recreational child (ages 1 to 5 and 6 to 15); adult community gardener; maintenance worker; and construction worker. There are no changes in the human health exposure pathways, receptors, or site conditions that would affect the protectiveness of the remedy.

The human health risk assessment process in the 2000 Remedial Investigation was reviewed specifically for the selection of COPCs (based on the application of the May 2014 Regional Screening Levels, (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration\_table/Generic\_T ables/index.htm) and estimation of carcinogenic and non-carcinogenic risk.

- No additional COPCs would be identified using the 2014 Regional Screening Levels in comparison to the RBCs used in the 2000 Remedial Investigation (i.e., although the 2014 screening values for some constituents [e.g., cobalt] are lower than the 2000 values, the maximum detected concentration for these constituents do not exceed the 2014 values and therefore no additional COPCs would be identified).
- Current toxicity factors (based on the 2014 Regional Screening Levels) consisting of the cancer slope factors (CSFs) and reference dose factors (RfDs) for the identified COPCs were compared with those used in the 2000 Remedial Investigation (refer to table below). All the CSFs and RfDs are the same for the 2014 and 2000 values with the exception of iron and vanadium, whose RfD values are slightly lower in 2014 compared to the 2000 values. For these

COPC	CSF (mg/kg-day) <sup>-1</sup> [Oral]		RfD (mg/kg-day) [Oral]			
	2014	2000	2014	2000		
Aluminum	NA	NA	1.0	1.0		
Antimony	NA	NA	0.0004	0.0004		
Arsenic	1.5	1.5	0.0003	0.0003		
Cadmium	NA	NA	0.001	0.001		
Chromium	NA	NA	0.003	0.003		
Iron	NA	NA	0.14	0.3		
Manganese	NA	NA	0.024	0.02		
Vanadium	NA	NA	0.005	0.007		
Benzo(a)pyrene	7.3	7.3	NA	NA		
4,4-DDT	0.34	0.34	0.0005	0.0005		
NA = not applicable						

constituents, calculated non-carcinogenic risks using 2014 RfD would be slightly higher than the 2000 calculation.

Although the non-carcinogenic risks associated with iron and vanadium (based on the latest RfD values) would be slightly higher than that calculated during the RI, institutional controls have been implemented and maintained as part of the remedy to prevent unacceptable exposure to soils impacted by these COCs. Therefore, changes in the toxicity factors for COCs at the site do not appear to affect the protectiveness of the remedy. The exposure assumptions, toxicity data, and RAOs used for the remedy selection are still valid for the purposes of this five-year review.

#### 7.3 QUESTION C

# HAS ANY OTHER INFORMATION COME TO LIGHT THAT CALLS INTO QUESTION THE PROTECTIVENESS OF THE REMEDY?

The only new information calling into question the remedy's protectiveness at the site is the potential presence of new emerging contaminant(s).

EPA proposes no more than 30 new emerging, unregulated contaminants every 5 years-as required by the Safe Drinking Water Act amendments in 1996-to be monitored and evaluated in the U.S. public water supply. This allows EPA to determine the primary sources of occurrence and exposure information the agency uses to develop regulatory decisions for contaminants of concern. EPA's latest proposal for 28 unregulated chemicals and 2 viruses was published in the Federal Register in 2012 (see Unregulated Contaminant Monitoring Rule 3 [UCMR3] at http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/ucmr3/index.cfm). These will undergo assessment monitoring and/or screening surveys throughout the U.S. public water supply in 2013 to 2015. Six of the unregulated chemicals detailed in UCMR3 are the following: perfluorinated compounds (PFCs): perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA), and perfluorobutanesulfonic acid (PFBS).

PFCs were a component of AFFF used for firefighting responses and/or for training exercises. AFFF is composed of complex mixtures of fluorocarbon surfactants designed to spread over hydrocarbon fires, extinguish the flames and prevent re-ignition. These compounds consist of a carbon backbone with fluorine atoms attached. Due to the fluorine atoms, these chemicals are extremely persistent in the environment and resistant to typical environmental degradation processes. Two of the PFCs that have come under increased regulatory scrutiny are PFOA and PFOS. Studies have shown both PFOS and PFOA have the potential to bioaccumulate and biomagnify in wildlife. They are readily adsorbed after oral exposure and accumulate primarily in the serum, kidney, and liver. Human health toxicity values are available only for these two PFCs, but these values are considered "Tier 3" toxicity values, which means they are the most uncertain, and consensus has not been reached about the validity of these values.

Records were identified that indicate an AFFF extinguishing system was located next to a concrete pad about fifty yards from a main fire testing area, near the north end of the present Children's Theater. No specific reference to PFCs in the AFFF system was identified, however, given the dates and nature of fire test and fire suppression research conducted, PFC-based AFFFs were presumably used at some time prior to 1986 at Bay Head Road Annex.

Groundwater at the site was not tested for PFCs, and they were not evaluated in the site risk assessments. Currently the site and vicinity is connected to the City of Annapolis municipal water supply system. According to the FOST, county and state regulations prohibit the installation of a water supply well in an area served by a public water system. In October 2013 and April 2014 water samples collected at the Annapolis water treatment plant, point of effluent, were non-detect for PFOA and PFOS (USEPA, 2014). In 2009, EPA developed Provisional Health Advisory values for drinking water for PFOA (0.4 micrograms per liter [ $\mu$ g/L]) and PFOS (0.2  $\mu$ g/L). The provisional health advisories are not legally enforceable. Other than the potential presence of PFCs in the groundwater, no other information has been made available that calls into question the protectiveness of the remedial action.

#### 7.4 TECHNICAL ASSESSMENT SUMMARY

According to the information presented herein, the final remedy is functioning as intended by the ROD. There have been no changes in the physical condition of the site or site use (current or expected future land use) that would affect the protectiveness of the remedy. There is no other information that calls into question the effectiveness of the remedy. As long as the institutional control of a deed restriction to prohibit residential use is enforced, risk levels to humans should remain within acceptable levels.

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### 8.0 ISSUES

The only issue identified during this review is the potential for the presence of one or more PFCs in the groundwater at the site. Groundwater at the site has not been tested for these emerging contaminants.

# 9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

The potential presence of PFOA and PFOS in groundwater should be evaluated prior to the next FYR. The Navy will work with MDE to determine the most appropriate path forward for the future evaluation.

### **10.0 PROTECTIVENESS STATEMENT**

The remedy of institutional controls (deed restriction prohibiting residential use) for the former Bay Head Road Annex is protective of human health and the environment. The remedy is functioning as intended. The current and expected future land use as a public park is consistent with the institutional controls established for the site. The exposure assumptions and toxicity data used at the time of the final remedy selection are still valid. No other information has been identified that could call into question the protectiveness of the final remedy.

### 11.0 NEXT REVIEW

The next Five-Year Review for the former Bay Head Road Annex will be completed within five years of the signature date of this report. It is expected to be completed and provided to the MDE by May 2015.

### **12.0 REFERENCES**

EA Engineering, Science, and Technology, Inc., 1991. Site Inspection Study, David Taylor Research Center, Bay Head Road Annex, Annapolis, Maryland. October.

EA Engineering, Science, and Technology, Inc. 2000. *Remedial Investigation, Naval Surface Warfare Center, Carderock Division-Annapolis Detachment, Bay Head Road Annex, IR Program Site 1, Annapolis, Maryland.* Final prepared for Department of the Navy Engineering Field Activity Chesapeake. January.

EPA, 1997. *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments*. Interim Final. EPA 540-R-99-006. Edison, NJ.

EPA, 2001. Comprehensive Five-Year Review Guidance, Office of Emergency and Remedial Response, EPA-R-01-007. June.

EPA, 2013. Emerging Contaminants INTERNET Web Site. From <a href="http://www.epa.gov/fedfac/documents/emerging\_contaminants.htm">http://www.epa.gov/fedfac/documents/emerging\_contaminants.htm</a>. Accessed on September 2, 2014.

EPA, 2014. *The Third Unregulated Contaminant Monitoring Rule (UCMR 3): Data Summary*. <u>http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/data.cfm</u> October.

Department of the Navy 2001a. Navy/Marine Corps Policy for Conducting Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Statutory Five-year Reviews. November.

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Department of the Navy, 2001c. Finding of Suitability to Transfer (FOST), Naval Surface Warfare Center-Carderock Division, Annapolis Detachment, Annapolis, Maryland. March.

Department of the Navy, 2005. *Final Five- Year Review Report for Bay Head Road Annex, IR Program Site 1 – Former Naval Surface Warfare Center – Carderock Division, Annapolis Detachment, Annapolis, Maryland.* Naval Facilities Engineering Command Washington. May.

Rev. 0 12/18/14

# APPENDIX A

# SITE INSPECTION CHECKLIST

# **Five-Year Review Site Inspection Checklist**

		I. SITE	E INFO	ORMATIC	N		
Site name: For Bay Head Road	mer NSWC Anna Annex	polis Detachme	ent –	Date of in	spection: Septe	mber 23, 2(	)14
Location and F	tegion: Annapolis	, MD		EPA ID:	MD 3170000167	7	
Agency, office, review: Navy	or company leadi	ng the five-year		Weather/	temperature: S	unny, hot, 8	85° F
Remedy Includ □ La □ Ac ☑ In □ Gr □ Su	les: (Check all that ndfill cover/contain cess controls stitutional controls oundwater pump ar rface water collection	apply) ment ad treatment on and treatment	□ M □ G □ V	Aonitored n Groundwate Vertical barr	atural attenuation r containment rier walls	1	
Attachments:	Inspection tear	n roster attached	1	□ Site	e map attached		
Attachments:	Inspection tear	n roster attached	l EWS (	□ Site Check all t	e map attached hat apply)		
Attachments:	Inspection tear	n roster attached II. INTERVIE <u>N/A</u> Name at office rt attached	l ZWS (	□ Site Check all t y phone	e map attached hat apply) Title Phone no		Date
Attachments:  1. O&M site n Interviewed Problems, su 2. O&M staff	Inspection tear	n roster attached II. INTERVIE <u>N/A</u> Name at office t attached	i EWS ( 	□ Site Check all t y phone  	e map attached hat apply) Title Phone no		Date

3. <b>Local reg</b> office, po deeds, or	gulatory authorities and response as lice department, office of public head other city and county offices, etc.) F	gencies (i.e., State and th or environmental he ill in all that apply.	Tribal offices, et alth, zoning offic	mergency response e, recorder of
Agency Contact	Maryland Department of the Enviro Linda Gustafson	nment <u>RPM</u>	10/02/	410-537-
4236	Name	Title	Date	Phone no.
Problems	; suggestions; I Report attached Sec	e Appendix C – No pro	oblems noted	
Agency Contact				
Problems	Name ; suggestions; □ Report attached	Title	Date	Phone no.
Agency _ Contact _				
Problems	Name ; suggestions; □ Report attached	Title	Date	Phone no.
Agency _ Contact _				
Problems	Name ; suggestions; □ Report attached	Title	Date	Phone no.
4. Other in	terviews (optional) ⊠ Report attache	ed.		
David Steckler – F	Remedial Project Manager, NAVFAC	Washington		
Ginny White – Ex	ecutive Director, Children's Theatre	of Annapolis		
Mark Garrity – Pa	rks Administrator, Anne Arundel Cou	unty Department of Rec	creation and Parl	KS

	III. ON-SITE DOCUME	NTS & RECORDS VERI	FIED (Check all	that apply	)	
1.	O&M Documents					
	□ O&M manual	□ Readily available	$\Box$ Up to date	$\bowtie$ N/A		
	□ As-built drawings	□ Readily available	$\Box$ Up to date	$\bowtie$ N/A		
	□ Maintenance logs Remarks	□ Readily available	□ Up to date	⊠ N/A		
2.	Site-Specific Health and Safety	Plan 🗆 Readily a	available 🗆 Up t	o date	⊠ N/A	
	□ Contingency plan/emergency re Remarks	esponse plan	vailable 🗆 Up t	o date	⊠ N/A	
3.	O&M and OSHA Training Reco Remarks	ords 🛛 Readily availa	able 🗆 Up t	o date	⊠ N/A	
4.	Permits and Service Agreement	S				
	□ Air discharge permit	Readily availa	able 🛛 Up t	o date	⊠ N/A	
	□ Effluent discharge	Readily available	able 🛛 Up t	o date	⊠ N/A	
	□ Waste disposal, POTW	□ Readily avail	able 🛛 Up t	o date	⊠ N/A	
	□ Other permits Remarks	□ Readily availa	able 🗆 Up t	o date	⊠ N/A	
5.	Gas Generation Records Remarks	□ Readily availa	able 🗆 Up t	o date	⊠ N/A	
6.	Settlement Monument Records Remarks	□ Readily availa	able 🗆 Up t	o date	⊠ N/A	
7.	Groundwater Monitoring Recor Remarks	rds 🛛 Readily availa	able 🗆 Up t	o date	⊠ N/A	
8.	Leachate Extraction Records Remarks	□ Readily availa	able 🗆 Up t	o date	⊠ N/A	
9.	Discharge Compliance Records					
	□ Air	Readily available	able 🛛 Up t	o date	⊠ N/A	
	□ Water (effluent) Remarks	□ Readily availa	able 🗆 Up t	o date	⊠ N/A	

10.	Daily Access/Sec Remarks	curity Logs	□ Readily ava	ilable $\Box$ Up to date $\boxtimes$ N/A
		IV. 0&	M COSTS	ble $\boxtimes$ N/A
1.	O&M Organiza <ul> <li>State in-house</li> <li>PRP in-house</li> <li>Federal Facilit</li> <li>Other</li> </ul>	<b>tion</b> y in-house	<ul> <li>Contractor for State</li> <li>Contractor for PRP</li> <li>Contractor for Federa</li> </ul>	al Facility
2.	O&M Cost Reco	ords ble	o date in place D Bre cost by year for review pe	eakdown attached eriod if available
	From	То		□ Breakdown attached
	Date	Date	Total cost	-
	FromDate	_ 10 Date	Total cost	_ Dreakdown attached
	From	_To	T	□ Breakdown attached
	From	To	l otal cost	□ Breakdown attached
	Date	Date	Total cost	-
	FromDate	_ Io Date	Total cost	_ Breakdown attached
3.	Unanticipated o Describe costs ar	r Unusually High ad reasons:	h O&M Costs During R	eview Period
	V. ACC	ESS AND INST	ITUTIONAL CONTRO	<b>DLS</b>
A. Fe	ncing			
1.	Fencing damage <u>Remarks</u> Mult <u>exit.</u>	ed	tion shown on site map opening on along fence	□ Gates secured □ N/A perimeter. Appears to be used for entry and
B. Ot	her Access Restric	tions		
1.	Signs and other Remarks	security measur	es 🗆 Location she	own on site map 🖾 N/A

C. Ins	stitutional Controls (ICs)			
1.	Implementation and enforcement			
	Site conditions imply ICs not properly implemented	□ Yes	🗵 No	$\square$ N/A
	Site conditions imply ICs not being fully enforced	□ Yes	⊠ No	$\Box$ N/A
	Type of monitoring ( <i>e.g.</i> , self-reporting, drive by) Frequency			
	Responsible party/agency			
	Name Title	Dat	te Phone	e no.
	Reporting is up-to-date	□ Yes	🗆 No	⊠ N/A
	Reports are verified by the lead agency	□ Yes	□ No	$\bowtie$ N/A
	Specific requirements in deed or decision documents have been met	⊠ Yes	🗆 No	□ N/A
	Violations have been reported	□ Yes	🗵 No	□ N/A
	Other problems or suggestions: $\Box$ Report attached			
2.	Adequacy       ICs are adequate       ICs are inade         Remarks	quate		□ N/A
D. Ge	neral			
1.	Vandalism/trespassing□Location shown on site map⊠NoRemarksProperty user aware of past vandalism incidents	vandalism	n evident	
2.	Land use changes on site  imes Applicable  imes N/A Remarks Site now used for recreational purposes including sports field are complete.	ds. Walkin -	ng path a	nd playground
3.	Land use changes off site			
	VI. GENERAL SITE CONDITIONS			
A. Ro	ads $\square$ Applicable $\square$ N/A			
1.	Roads damaged □ Location shown on site map ⊠ RoadsRemarks	ds adequa	nte	□ N/A

. 0			
	Remarks		
	VII. LA	NDFILL COVERS	N/A
. La	andfill Surface		
	Settlement (Low spots) Areal extent Remarks	Location shown on site map Depth	□ Settlement not evident
	Cracks	□ Location shown on site map	□ Cracking not evident
	Lengths W	idths Depths	C
	Remarks		
	Erosion	$\Box$ Location shown on site map	□ Erosion not evident
	Areal extent	Depth	
	Remarks		
	Holes	□ Location shown on site map	□ Holes not evident
	Holes Areal extent	Location shown on site map Depth	□ Holes not evident
	Holes Areal extent Remarks	Location shown on site map Depth	□ Holes not evident
	Holes         Areal extent	Location shown on site map     Depth Grass □ Cover properly establ     and locations on a diagram)	□ Holes not evident
	Holes Areal extent Remarks Vegetative Cover Trees/Shrubs (indicate size Remarks Alternative Cover (armored)	Grass Cover properly estable and locations on a diagram)	Holes not evident
	Holes         Areal extent         Remarks	Location shown on site map     Depth  Grass □ Cover properly establ and locations on a diagram) I rock, concrete, etc.) □ N/A	Holes not evident
	Holes         Areal extent         Remarks	Grass Cover properly estable and locations on a diagram)	Holes not evident
	Holes         Areal extent         Remarks	Cover properly estable and locations on a diagram)  I rock, concrete, etc.) N/A  Location shown on site map Haight	Holes not evident      ished      No signs of stress      Bulges not evident
	Holes         Areal extent         Remarks         Use         Vegetative Cover         Trees/Shrubs (indicate size         Remarks         Alternative Cover (armored         Remarks         Bulges         Areal extent         Remarks	Location shown on site map     Depth  Grass □ Cover properly estable and locations on a diagram)  I rock, concrete, etc.) □ N/A  Location shown on site map Height	Holes not evident      Holes not evident      Bulges not evident
	Holes         Areal extent         Remarks	Location shown on site map     Depth  Grass □ Cover properly estable and locations on a diagram)  I rock, concrete, etc.) □ N/A  Location shown on site map Height	Holes not evident
	Holes         Areal extent         Remarks	Location shown on site map     Depth  Grass □ Cover properly estable and locations on a diagram)  I rock, concrete, etc.) □ N/A  Location shown on site map Height Wat areas/water demage not as	Holes not evident
	Holes         Areal extent         Remarks         Urgetative Cover         Trees/Shrubs (indicate size         Remarks         Alternative Cover (armored         Remarks         Bulges         Areal extent         Remarks         Wet Areas/Water Damage	Location shown on site map     Depth  Grass □ Cover properly estable and locations on a diagram)  I rock, concrete, etc.) □ N/A  I cocation shown on site map Height Uccation shown on site map Location shown on site map	Holes not evident      Holes not evident      Bulges not evident      vident      Areal extent
	Holes         Areal extent         Remarks         Urgetative Cover         Trees/Shrubs (indicate size         Remarks         Alternative Cover (armored         Remarks         Bulges         Areal extent         Remarks         Wet Areas/Water Damage         Wet areas         Danding	Location shown on site map     Depth  Grass □ Cover properly estable and locations on a diagram)  I rock, concrete, etc.) □ N/A  I cocation shown on site map Height Uccation shown on site map Location shown on site map	Holes not evident      Holes not evident      Bulges not evident      Areal extent      Areal extent
	Holes         Areal extent         Remarks	Location shown on site map     Depth  Grass □ Cover properly estable and locations on a diagram)  I rock, concrete, etc.) □ N/A  Location shown on site map Height Wet areas/water damage not ev Location shown on site map	Holes not evident      Holes not evident      Ished      No signs of stress      Bulges not evident      Areal extent      Areal extent      Areal extent
	Holes         Areal extent         Remarks	Location shown on site map     Depth  Grass □ Cover properly estable and locations on a diagram)  I rock, concrete, etc.) □ N/A  Location shown on site map     Height  Wet areas/water damage not ev     Location shown on site map     Location shown on site map	Holes not evident      Holes not evident      Ished      No signs of stress      Bulges not evident      Areal extent

9.	Slope Instability   □     Areal extent     Remarks	des □ Location shown on site map □ No evidence of slope instability 
B. B	Genches	ble IN/A ounds of earth placed across a steep landfill side slope to interrupt the slope clocity of surface runoff and intercept and convey the runoff to a lined
1.	Flows Bypass Bench Remarks	□ Location shown on site map □ N/A or okay
2.	Bench Breached Remarks	$\Box$ Location shown on site map $\Box$ N/A or okay
3.	Bench Overtopped Remarks	$\Box$ Location shown on site map $\Box$ N/A or okay
C. L	Applie (Channel lined with erosio slope of the cover and will cover without creating eros	ble $\boxtimes$ N/A control mats, riprap, grout bags, or gabions that descend down the steep sic llow the runoff water collected by the benches to move off of the landfill on gullies.)
1.	Settlement Areal extent Remarks	Location shown on site map
2.	Material Degradation Material type Remarks	Location shown on site map               No evidence of degradation             Areal extent
3.	Erosion Areal extent Remarks	Location shown on site map Depth
4.	Undercutting Areal extent Remarks	Location shown on site map Depth
5.	Obstructions Type □ Location shown on site Size Remarks	ap Areal extent

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6.	Excessive Vegetative Growth Type	
	<ul> <li>No evidence of excessive growth</li> <li>Vegetation in channels does not obstruct flow</li> <li>Location shown on site map</li> <li>Areal extent</li> <li>Remarks</li> </ul>	-
D. C	over Penetrations	
1.	Gas Vents       Active       Passive         Properly secured/locked       Functioning       Routinely sampled       Good condition         Evidence of leakage at penetration       Needs Maintenance       Good condition         N/A       Remarks	-
2.	Gas Monitoring Probes         Properly secured/locked       Functioning         Evidence of leakage at penetration       Needs Maintenance         N/A	_
3.	Monitoring Wells (within surface area of landfill)         Properly secured/locked       Functioning         Evidence of leakage at penetration       Needs Maintenance         Remarks	-
4.	Leachate Extraction Wells         Properly secured/locked       Functioning       Routinely sampled       Good condition         Evidence of leakage at penetration       Needs Maintenance       N/A         Remarks	
5.	Settlement Monuments          □ Located         □ Routinely surveyed         □ N/A         Remarks	-
E. G	as Collection and Treatment	<u> </u>
1.	Gas Treatment Facilities         Flaring       Thermal destruction         Good condition       Needs Maintenance         Remarks	_
2.	Gas Collection Wells, Manifolds and Piping         Good condition       Needs Maintenance         Remarks	-
3.	Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings)         Good condition       Needs Maintenance       N/A         Remarks	-

F.	Cover Drainage Layer		⊠ N/A
1.	Outlet Pipes Inspected Remarks	Functioning	□ N/A
2.	Outlet Rock Inspected Remarks		□ N/A
G.	Detention/Sedimentation Por	nds 🗌 Applicable	⊠ N/A
1.	Siltation Areal extent	Depth	N/A
2.	Erosion Areal ex Erosion not evident Remarks	ctent Der	
3.	Outlet Works Remarks	□ Functioning □ N	J/A
4.	Dam Remarks		N/A
H.	Retaining Walls	$\Box \text{ Applicable } \boxtimes \text{ N/A}$	
1.	<b>Deformations</b> Horizontal displacement_ Rotational displacement_ Remarks	Location shown on site     Vertical	map
2.	Degradation Remarks	□ Location shown on site	map
<b>I.</b> ]	Perimeter Ditches/Off-Site Di	scharge 🛛 Appli	icable 🖂 N/A
1.	Siltation	tion shown on site map  S Depth	Siltation not evident
2.	Vegetative Growth Uegetation does not im Areal extent Remarks	Location shown on site pede flow     Type	map 🗆 N/A

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3.	Erosion Areal extent Remarks	□ Location shown on site map □ Erosion not evident Depth	
4.	Discharge Structure Remarks	□ Functioning □ N/A	
	VIII. VEI	RTICAL BARRIER WALLS	
1.	Settlement Areal extent Remarks	<ul> <li>Location shown on site map</li> <li>Depth</li> </ul>	
2.	Performance Monitoria	ngType of monitoring tored □ Evidence of breaching	
	IX. GROUNDWAT	<b>TER/SURFACE WATER REMEDIES</b>	
A. G	roundwater Extraction W	ells, Pumps, and Pipelines	
1.	Pumps, Wellhead Plum Good condition A Remarks	Ibing, and Electrical Il required wells properly operating	A
2.	Extraction System Pipe	Ines, Valves, Valve Boxes, and Other Appurtenances	
3.	Spare Parts and Equip ☐ Readily available Remarks	ment □ Good condition □ Requires upgrade □ Needs to be provided	d
B. Sı	urface Water Collection St	ructures, Pumps, and Pipelines	
1.	Collection Structures, I Good condition Remarks	Pumps, and Electrical	
2.	Surface Water Collecti Good condition Remarks	on System Pipelines, Valves, Valve Boxes, and Other Appurtenance	es

3.	Spare Parts and Equipme Readily available Remarks	ent Good condition	□ Requires upgrad	e
С. 7	Treatment System	□ Applicable 🖂	N/A	
1.	Treatment Train (Check o Metals removal Air stripping Filters Additive ( <i>e.g.</i> , chelation	components that appl Oil/water Carbon at agent, flocculent)	y) separation osorbers	□ Bioremediation
	<ul> <li>Others</li> <li>Good condition</li> <li>Sampling ports properly</li> <li>Sampling/maintenance logical condition</li> <li>Equipment properly iden</li> <li>Quantity of groundwater</li> <li>Quantity of surface wate</li> <li>Remarks</li></ul>	□ Needs Ma marked and function og displayed and up t tified treated annually r treated annually	intenance al o date	
2.	Electrical Enclosures and N/A Good of Remarks	Panels (properly rate condition	ed and functional) Needs Maintenance	
3.	Tanks, Vaults, Storage Vo □ N/A □ Good condition Remarks	essels	condary containment	□ Needs Maintenance
4.	Discharge Structure and A N/A Good of Remarks	Appurtenances condition	Needs Maintenance	
5.	Treatment Building(s)         N/A       Good of         Chemicals and equipmer         Remarks	condition (esp. roof a at properly stored	nd doorways)	Needs repair
6.	Monitoring Wells (pump a Properly secured/locked All required wells locate Remarks	nd treatment remedy □ Functioning d □ Needs Maint	) Routinely sample enance N/A	ed
D. N	Monitoring Data	pplicable 🗵	N/A	
1.	Monitoring Data	time	□ Is of acceptable qua	lity
2.	Monitoring data suggests:	fectively contained	Contaminant concer	trations are declining

D. N	Ionitored Natural Attenuation
1.	Monitoring Wells (natural attenuation remedy)         Properly secured/locked       Functioning       Routinely sampled       Good condition         All required wells located       Needs Maintenance       N/A         Remarks
	X. OTHER REMEDIES
	If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.
	XI. OVERALL OBSERVATIONS
A.	Implementation of the Remedy
	Describe issues and observations relating to whether the remedy is effective and functioning as designed Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).
	The institutional controls in the form of deed restrictions in place and seem to be functioning effectively. There is no evidence to suggest the restrictions on residential land use are being broken. The site inspection verified that institutional controls are still in place.
В.	Adequacy of O&M
	Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.
	<u>N/A</u>

C.	Early Indicators of Potential Remedy Problems					
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, which suggest that the protectiveness of the remedy may be compromised in the future.					
	<u>N/A</u>					
D						
D.	Opportunities for Optimization					
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.					
	<u>N/A</u>					

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### **APPENDIX B**

# SITE PHOTOGRAPHS









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## **APPENDIX C**

# **INTERVIEWS**

# **INTERVIEW RECORD**

### INTERVIEW DOCUMENTATION FORM

The following is a list of individual interviewed for this five-year review. See the attached contact record(s) for a detailed summary of the interviews.

David Steckler	<u>Navy RPM</u>	NAVFAC Washington	September 29, 2014
Name	Title/Position	Organization	Date
<u>Ginny White</u> Name	Executive Director Title/Position	<u>Children's Theatre of</u> <u>Annapolis</u> Organization	<u>No response</u> Date
<u>Mark Garrity</u> Name	Parks Administrator Title/Position	Anne Arundel Co Dept. of Recreation and Parks Organization	October 2, 2014 Date
<u>Linda Gustafson</u> Name	<u>RPM</u> Title/Position	<u>MDE – Federal Facilities</u> <u>Division</u> Organization	October 2, 2014 Date

	Bav	Head	Road	Annex	Five-	Year	Review	Interview	Information
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Date of Interview Form Completion	29 September 2014
Interviewee Name	David Steckler
Title	Remedial Project Manager
Organization	Department of the Navy
Address	1314Harwood Street SE, Washington Navy Yard, DC 20374
Phone	202.685.3275
Email	David.steckler@navy.mil
Person conducting Interview (if applicable)	N/A
Type of Interview Method	Email form

## **Interview Ouestions**

### **Background Information**

1. What is your overall impression of the project? (General sentiment)

### Response – good.

2. What effects have site operations had on the surrounding community?

#### Response – to my knowledge, none.

3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

#### Response – no.

4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.

### Response – no.

5. Do you feel well informed about the site's activities and progress?

#### Response – not other than the CERCLA requirements.

6. Do you have any comments, suggestions, or recommendations regarding the site's impact on the community?

Response – no.

#### State and Local Considerations

7. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, give purpose and results.

#### Response - no.

8. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses.

#### Response – no.

9. Have there been any changes in regulations or clean up levels since implementing the remedy that may affect the site?

#### Response – **not to my knowledge**

#### Performance and Operations and Maintenance (O&M) Problems

10. Is the remedy functioning as expected? How well is the remedy performing?

#### Response – yes; as appropriate.

11. Is there a continuous on-site Operations and Maintenance (O&M) presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

#### Response - no.

12. Have any problems been encountered which required, or will require, changes to this remedial design or this Record of Decision (ROD)?

#### Response - no.

13. Do you have any comments, suggestions, or recommendations regarding the project's operations and site management?

Response – no.

Date of Interview Form	
Commission	
Completion	into lur
	10/0/19
Interviewee Name	
	Mark (Jarrity
Title	De La ARIAT
	FAFTIS HamiNISTRATON
Organization	
guilletter	Anne Arundel County
Address	
r kuur css	1 Harry S Truman Parkunay
	ANNED: MIN DILLING
	PID JIVI
Phone	11/11 222 - 215
	410-222-786)
Email	
	RPEARROOD a a county org
Person conducting Interview	
('C I' II')	
(if applicable)	
Type of Interview Method	01
	Duostinlein e
	LVM COLLONG

# **Bay Head Five-Year Review Interview Information**

### **Interview Questions**

#### **Background Information**

1. What is your overall impression of the project? (General sentiment)

Response - Very success tul

2. What effects have site operations had on the surrounding community?

Response - Increased use by citizens.

3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

Response - No

4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.

Response - Nes, IN 2013 vandals sprayed grafittion pienec tables under the pavillan 2014 - two youth durce vehicles on grass causing minor damage

5. Do you feel well informed about the site's activities and progress?

Response - Ves

6. Do you have any comments, suggestions, or recommendations regarding the site's impact on the community?

Response- The site has had a positive impact on the community Site is very popular with families.

#### **State and Local Considerations**

7. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, give purpose and results.

Response-Yes. Routine maintenance, safety patrols by Rapstaff. Rap submits astatus report to National Part Service every Syears, Lost report was completed in October 2010 8. Have there been any complaints, violations, or other incidents related to the site requiring a response

by your office? If so, please give details of the events and results of the responses.

Response - No

9. Have there been any changes in regulations or clean up levels since implementing the remedy that may affect the site?

Response - N/

### Performance and Operations and Maintenance (O&M) Problems

10. Is the remedy functioning as expected? How well is the remedy performing?

Response - Yes. Quite well.

11. Is there a continuous on-site Operations and Maintenance (O&M) presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

Response-Nort-continuous. Trash & safety patrols twice aweek by staff. Daily trash pictup by community volunteers

12. Have any problems been encountered which required, or will require, changes to this remedial design or this Record of Decision (ROD)?

Response - No

13. Do you have any comments, suggestions, or recommendations regarding the project's operations and site management?

Response - No


MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Boulevard • Baltimore MD 21230 410-537-3000 • 1-800-633-6101 • www.mde.maryland.gov

Martin O'Malley Governor

Anthony G. Brown Lieutenant Governor Robert M. Summers, Ph.D. Secretary

October 20, 2014

Mr. Sean Chelius, P.G. H&S Environmental, Inc. 160 E. Main Street, Suite 2F Westborough, MA 01581

- RE: Five Year Review Interview Information Questionnaires for:
  - 1) Naval Surface Warfare Center Annex, David Taylor Research Center, and
  - 2) Bay Head Road Annex.

Dear Mr. Chelius:

The Federal Facilities Division of the Maryland Department of the Environment's Land Restoration Program has completed the above Five Year Review interview questionnaires as requested; please find them enclosed.

If you have any questions, please contact me at (410) 537-4238.

Sincerely,

. Dustafson

Linda Gustafson Remedial Project Manager Federal Facilities Division

LG:lg

Enclosures

cc: Mr. David Steckler Mr. Horacio Tablada Mr. James Carroll

# Bay Head Five-Year Review Interview Information

Date of Interview Form Completion	10/2/14
Interviewee Name	Linda Gustafson
Title	Remedial Program Manager
Organization	Maryland Dept of the Environment
Address	1800 Washington Boulevard, Suite 625 Baltimore, Maryland 21230
Phone	410-537-4238
Email	Linda. Gustation @maryland.gov
Person conducting Interview (if applicable)	nla
Type of Interview Method	paper-email

## **Interview Ouestions**

#### **Background Information**

1. What is your overall impression of the project? (General sentiment). None, as there has been will be no activity except reviewing the Five Year Review and Response- completing JEP activities.

2. What effects have site operations had on the surrounding community?

Response - None.

3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

Response - NO

4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.

Response -

5. Do you feel well informed about the site's activities and progress?

There are no activities except as described Response above.

6. Do you have any comments, suggestions, or recommendations regarding the site's impact on the community?



### State and Local Considerations

 Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, give purpose and results.

Response - No.

8. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses.

Response -No.

9. Have there been any changes in regulations or clean up levels since implementing the remedy that may affect the site?

Response - NO.

#### Performance and Operations and Maintenance (O&M) Problems

10. Is the remedy functioning as expected? How well is the remedy performing?

There are no problems that I am aware Response ---

 Is there a continuous on-site Operations and Maintenance (O&M) presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

Response -No.

12. Have any problems been encountered which required, or will require, changes to this remedial design or this Record of Decision (ROD)?

Response -

13. Do you have any comments, suggestions, or recommendations regarding the project's operations and site management?

Response -