



Final

Record of Decision

Areas of Concern J and R and Solid Waste Management Unit 7

Vieques, Puerto Rico
September 2011

1 Declaration

1.1 Site Name and Location

This Record of Decision (ROD) presents the No Further Action (NFA) determination for Areas of Concern (AOCs) J and R and Solid Waste Management Unit (SWMU) 7, located at the Former Naval Ammunition Support Detachment (NASD), Vieques, Puerto Rico. The former NASD was placed on the United States Environmental Protection Agency (EPA) National Priorities List (NPL) as part of the former Atlantic Fleet Weapons Training Area – Vieques on February 11, 2005 (Comprehensive Environmental Response, Compensation, and Liability Information System [CERCLIS] National Superfund database identification number: PRN000204694). The former NASD portion of the NPL site is on the western portion of Vieques, as distinguished from the eastern portion of the former Navy facility, also known as the former Vieques Naval Training Range (VNTR).

1.2 Statement of Basis and Purpose

The decision was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The United States Department of the Navy (Navy) (Naval Facilities Engineering Command [NAVFAC] Atlantic Division), EPA Region 2, Puerto Rico Environmental Quality Board (PREQB), and the Department of Interior [DOI]) entered into a Federal Facilities Agreement (FFA) for the former NASD in 2007, as a result of the NPL listing and pursuant to CERCLA. The FFA establishes the procedural framework and schedule for implementing the CERCLA response actions for Vieques. The Navy is the lead agency and responsible for ensuring that appropriate CERCLA response alternatives are developed and implemented as necessary to protect public health, welfare, and the environment.

The Navy and EPA Region 2 jointly selected the NFA determination for AOCs J and R and SWMU 7, with the concurrence of PREQB. This decision is based on information contained in the Administrative Record file for each site. Information not specifically summarized in this ROD or its references, but contained in the Administrative Record, has been considered and is relevant to the NFA determination for AOCs J and R and SWMU 7. Thus, this ROD is based upon and relies on those portions of the Administrative Record file for AOCs J and R and SWMU 7 in making the decision. This ROD is presented in a format that is conducive for the general public to read and understand the information upon which the decision for

each site was made, while providing links to the technical details presented in the Administrative Record.

AOCs J and R and SWMU 7 are 3 of 17 sites within the former NASD having been or currently being evaluated in accordance with CERCLA under the Navy's Environmental Restoration Program (ERP). The Site Management Plan (SMP) for Vieques further details the investigation history and the schedule for CERCLA investigations/remediation activities at the former NASD and is updated annually. This ROD solely addresses the final determination for AOCs J and R and SWMU 7 and does not include or affect any other sites at the former NASD. The final determinations for the other sites within the former NASD have been presented in past decision documents or will be presented separately in future RODs.

1.3 Description of Selected Remedy

The selected remedy for AOCs J and R and SWMU 7 is NFA, based on the results of environmental investigations and the removal action completed at these sites. The Navy and EPA, with concurrence from PREQB, have determined that NFA under CERCLA is appropriate to ensure protection of human health and the environment. There are no factors indicating unacceptable risk to human health or ecological receptors attributable to past releases that would warrant CERCLA response actions under current and unrestricted future land use scenarios. This determination is based on the evaluation of the information presented in the various environmental investigation reports for AOCs J and R and SWMU 7, which include risk assessments for human health and ecological receptors, as well as the results of a debris and contaminated-soil removal action completed at each site.

1.4 Statutory Determination

The NFA decision meets the statutory requirements and is protective of human health and the environment, complies with Federal and Commonwealth regulations that are applicable or relevant and appropriate, and allows for unlimited use and unrestricted exposure. A statutory 5-year review is not required for AOCs J and R and SWMU 7 under the NFA determination.

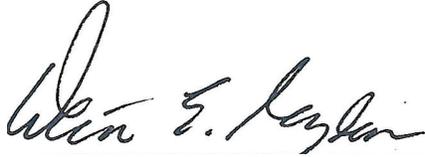
1.5 Navy Authorizing Signature for the Record of Decision for AOCs J and R and SWMU 7, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico

R. David Curfman

R. David Curfman, P.E.
Director, Environmental Programs
Naval Facilities Engineering Command, Atlantic

9/7/11
Date

1.6 EPA Authorizing Signature for the Record of Decision for AOCs J and R and SWMU 7, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico

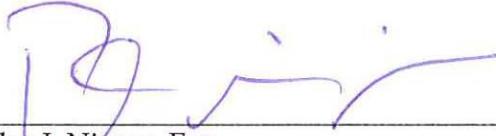


Sept. 21, 2011

Walter E. Mugdan, Director
Emergency and Remedial Response Division
Environmental Protection Agency, Region 2

Date

1.7 PREQB Concurrence Signature



9/6/11

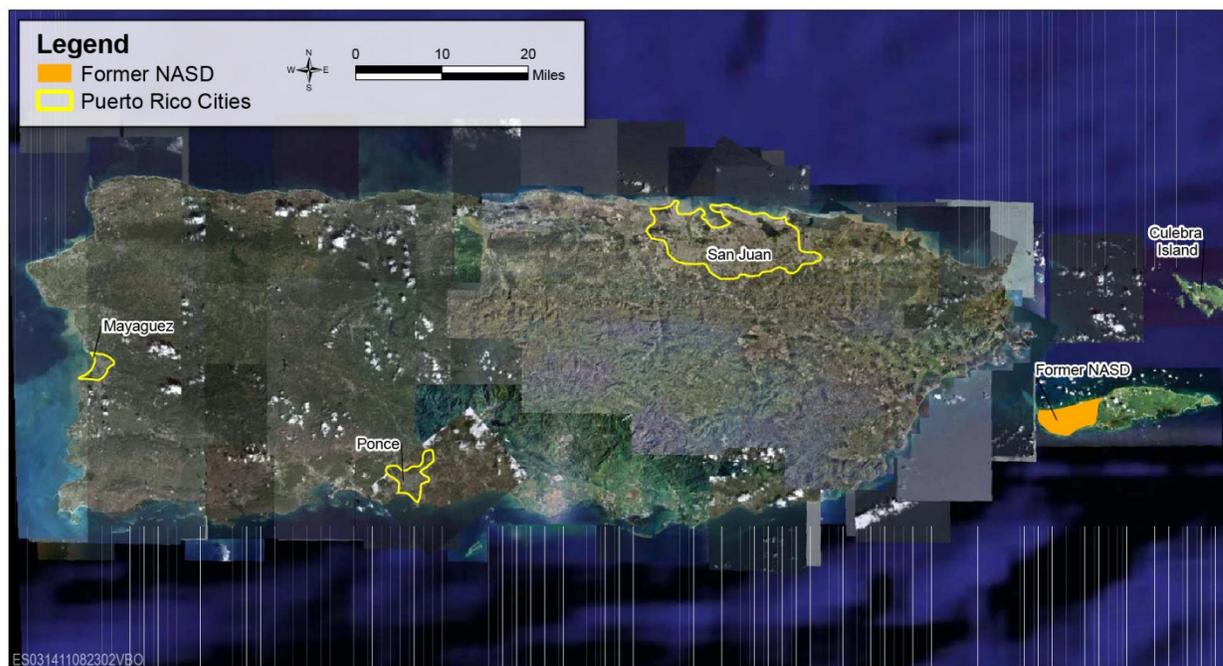
Pedro J. Nieves, Esq.
Executive Director
Puerto Rico Environmental Quality Board

Date

2 Decision Summary

Vieques Island is approximately 7 miles southeast of the eastern tip of the main island of Puerto Rico (Figure 1). Vieques is the largest island in the Commonwealth of Puerto Rico, encompassing 33,088 acres. The Navy purchased large portions of Vieques in the early 1940s to conduct activities related to military training. Site operations within the former NASD consisted mainly of ammunition loading and storage, vehicle and facility maintenance, and some training. The Navy ceased facility-wide operations on the former NASD in April 2001, in accordance with the January 30, 2000, Presidential Directive to the Secretary of Defense associated with the transfer of lands of the Navy-owned western portion of Vieques. The land transfer was completed on May 1, 2001, and the Navy has had no military presence at the main operational area since. Currently, the Navy's involvement at the former NASD comprises the environmental restoration program activities.

FIGURE 1
Regional Location Map



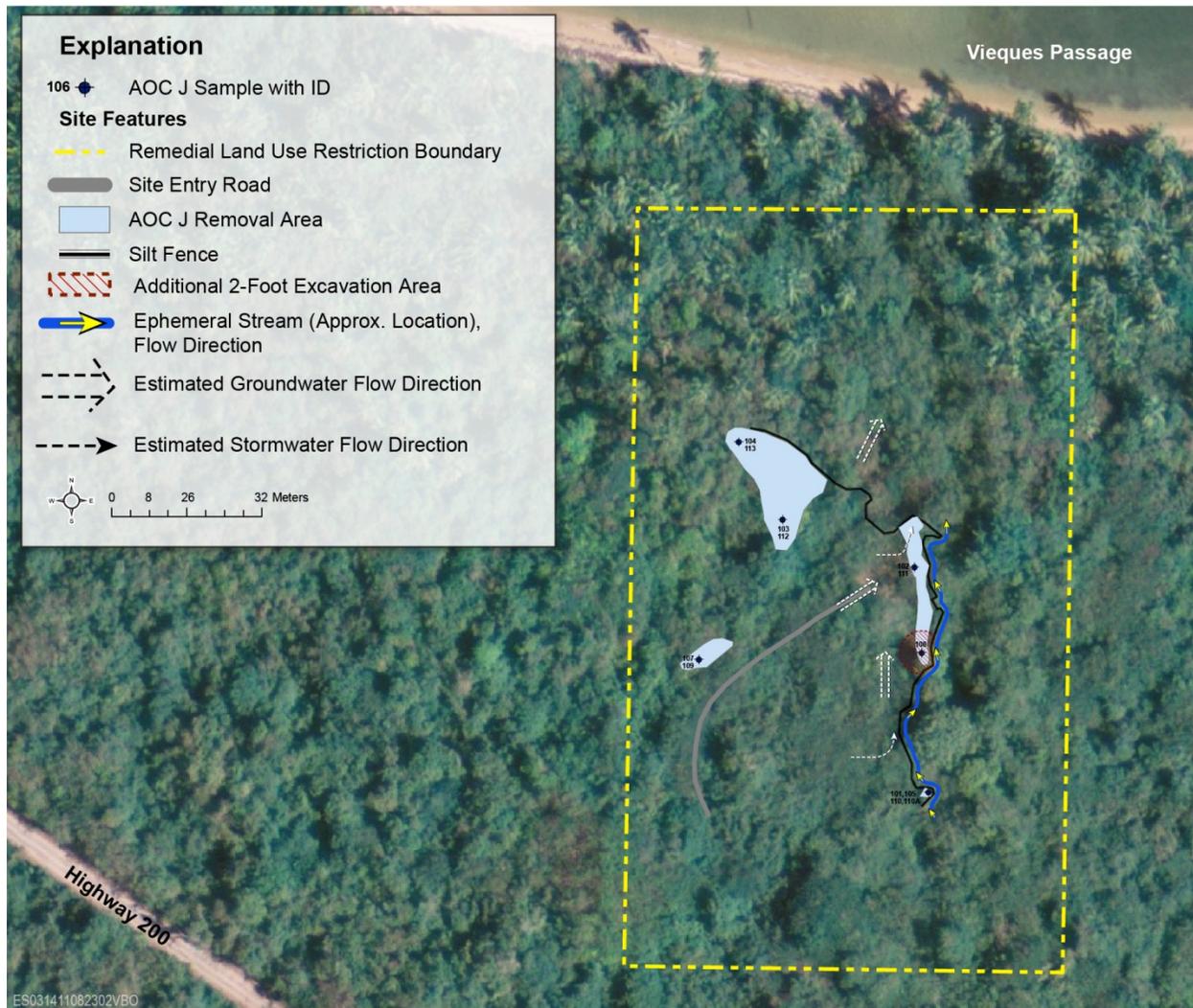
2.1 Area of Concern J

2.1.1 Site Description and History

AOC J, the Former Operations/Staging Area Disposal Site, comprises approximately 1.2 acres adjacent to Highway 200 on the former NASD (Figure 2). The site was used as a solid waste disposal site for construction staging activities in 1965 to 1973. Debris material included scrap metal from construction equipment, glass fragments, wood, one empty drum, and shell casings were identified at the site. AOC J is located on property owned by the DOI that has been designated as a wildlife refuge.

In preparation for transfer of portions of the former NASD to the DOI, a subjective boundary was surveyed and defined as the “Remedial Land Use Restriction” boundary within AOC J. As set forth in the Environmental Summary Document, DOI agreed that use and access to the area defined by the Remedial Land Use Restriction boundary shall be limited until CERCLA-related activities were completed and final land use(s) determined.

FIGURE 2
AOC J Site Map



2.1.2 Site Characteristics

AOC J is relatively flat, in a wooded area, and slopes from approximately 10 feet above mean sea level (msl) to sea level. An ephemeral stream located adjacent to the site drains north to the Vieques Passage (Figure 2). Surface water occurs within the ephemeral stream during periods of heavy and prolonged rainfall or ocean surge action.

Groundwater at AOC J is first encountered within alluvial deposits of clay and sandy clay at depths that ranged from 5 to 11 feet below ground surface (ft bgs). Groundwater flows north toward the Vieques Passage, with some localized groundwater flow to the east and

northeast toward the ephemeral stream. Groundwater beneath AOC J is generally brackish to saline due to sea water intrusion based on site-specific salinity measurements collected from monitoring wells.

2.1.3 Previous Investigations and Removal Actions

Environmental investigations at AOC J were initiated with an Environmental Baseline Survey (EBS), conducted in 2000 to identify potential contaminants based on historical uses at the former staging area disposal site. Subsequent investigations, including a Remedial Investigation (RI) that incorporated a Human Health Risk Assessment (HHRA) and an Ecological Risk Assessment (ERA), were conducted at the site. A removal action was conducted following the RI to eliminate potential ongoing and future sources of releases (debris and contaminated soil); confirmatory sampling and post-removal-action risk assessments were conducted to ensure the post-removal site conditions are protective of human health and the environment. Table 1 summarizes previous studies and investigations and the removal action conducted at AOC J.

TABLE 1
Previous Investigations and Removal Action at AOC J

Previous Investigations/ Removal Action*	Date	Investigation Activities
Environmental Baseline Survey	2000	Records review and personnel interviews were conducted to disclose relevant information regarding the environmental condition of the site prior to property transfer of the former NASD. Two subsurface soil samples ¹ were collected adjacent to a debris pile and analyzed for VOCs, semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and inorganic constituents. No constituents of concern (COCs) were identified; however, additional investigations were recommended to further characterize the site.
Background Investigation	2000	A background study was conducted in the western portion of Vieques to develop a set of background values for inorganic constituents in the soil to help distinguish inorganic concentrations that occur naturally in environmental media from those that may be present as a result of a site-related release. The background data were collected specifically from the western portion of Vieques to represent soil types similar to those where environmental sites are located in the Former NASD. The background inorganic constituent concentrations were used for comparison with soil inorganic constituent concentrations collected during the environmental investigations at AOC J.
Expanded Preliminary Assessment/Site Inspection	2002	Five soil (surface and subsurface), surface water, and sediment samples and four groundwater samples were collected during the Expanded Preliminary Assessment/Site Inspection (PA/SI) and analyzed for volatile organic compounds (VOCs), SVOCs, pesticides, PCBs, explosives, and inorganic constituents. The analytical results ² identified the presence of ten inorganic constituents at concentrations above EPA screening values. Further investigation was recommended to determine the nature and extent of contamination.

TABLE 1
Previous Investigations and Removal Action at AOC J

Previous Investigations/ Removal Action*	Date	Investigation Activities
Remedial Investigation	2003-2007	Soil, groundwater, sediment, and surface water samples were collected during the remedial investigation (RI) and analyzed for VOCs, SVOCs, pesticides, PCBs, explosives, and inorganics. Analytical results³ from the PA/SI and the RI suggested that there were no unacceptable risks to human health and the environment; however, due to uncertainty in the conclusions (samples were collected primarily adjacent to debris piles rather than directly through the debris piles) and because of the presence of potential contaminant sources (debris), a removal action was recommended.
Engineering Evaluation/Cost Analysis for Area of Concern J and R, and Solid Waste Management Unit 7	2005	Due to the uncertainty in the conclusions of the RI and presence of potential future sources of releases (debris), an Engineering Evaluation/Cost Analysis (EE/CA) was completed to develop and evaluate three removal action alternatives⁴ for the debris piles⁵ at AOC J. Off-site disposal followed by site restoration was the selected removal action for AOC J.
Pre-Removal Waste Characterization Sampling	2006	Nine pre-removal waste characterization soil samples from within the debris areas were collected to perform a pre-removal HHRA and ERA. The pre-removal waste characterization samples were analyzed for VOCs, SVOCs, pesticides, PCBs, explosives, and inorganics.
Pre-Removal Waste Characterization Human Health and Ecological Risk Assessments for AOC J	2008	A pre-removal HHRA and ERA were conducted to determine the areas of soil requiring excavation (together with the debris) as well as the appropriate disposal options for the soil. The soil dataset⁶ for the HHRA and the soil dataset⁷ for the ERA comprised surface and subsurface soil samples collected from within the debris areas during the PA/SI, the RI, and pre-removal waste characterization sampling. No potentially unacceptable human health risks⁸ were identified for any receptors exposed to site soil. Potentially unacceptable ecological risks⁹ were identified for receptors exposed to lead, selenium, and zinc in soil within portions of the debris areas and selenium and zinc for food web exposures.
Determination of the Disposition of Excavated Soils at AOC J Technical Memorandum	2008	Results of the pre-removal HHRA and ERA were used to determine areas of soil requiring removal (for unrestricted use), as well as the appropriate soil disposal options for AOC J. Four disposition options¹⁰ were considered, based on results of the pre-removal HHRA and ERA. Option 4, a combination of the other three options, was selected. A soil disposition map¹¹ identified the disposal determination by location (i.e., to remain onsite, or use as daily cover at the Vieques Municipal Landfill) for site soils to be excavated with the debris.
Final Completion Report	2010	Between March and July 2009, approximately 366 tons of soil and debris were removed. The removal action eliminated potential future sources of contamination and areas of soil potentially posing unacceptable risks to ecological receptors. Following completion of the removal action, confirmation soil samples were collected and used to complete a post-removal HHRA and ERA.

TABLE 1
Previous Investigations and Removal Action at AOC J

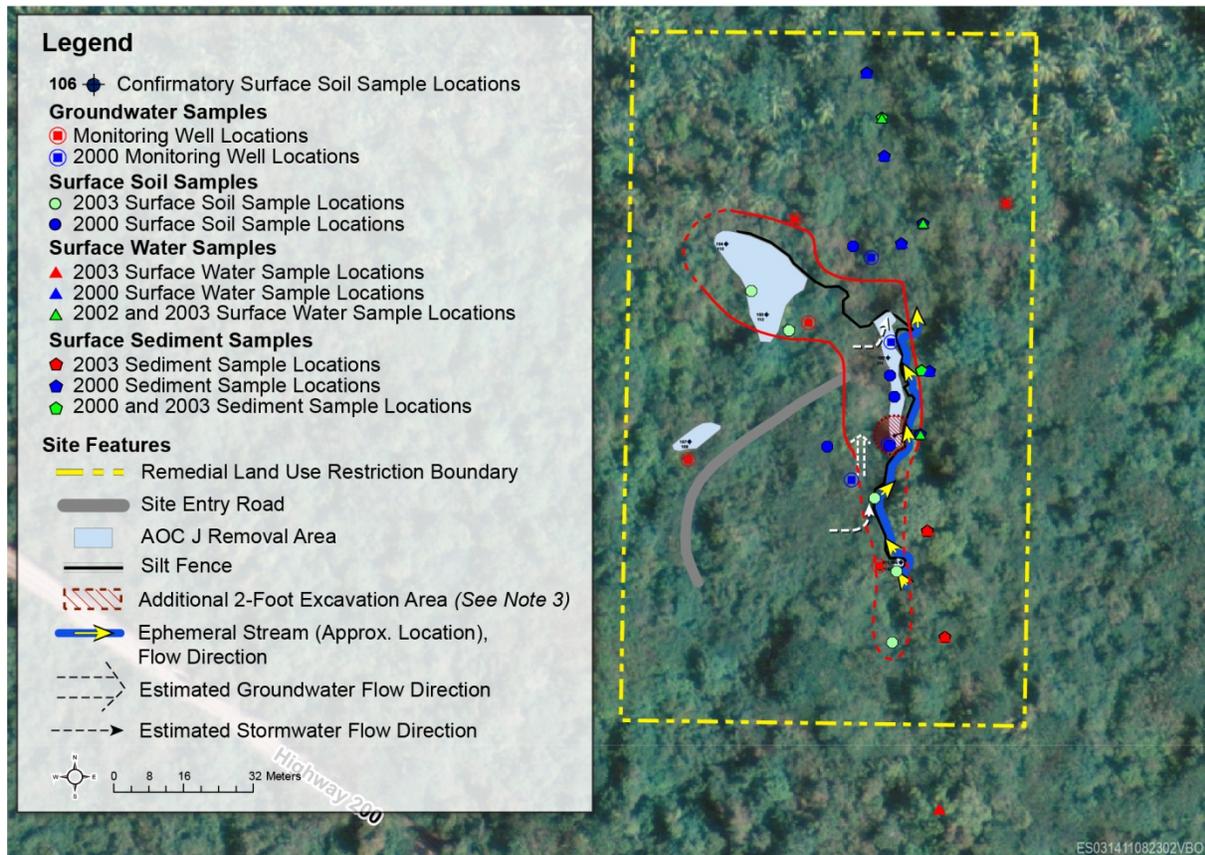
Previous Investigations/ Removal Action*	Date	Investigation Activities
Post-Removal Action Risk Assessment Report, Area of Concern (AOC) J and Solid Waste Management Unit (SWMU) 7	2011	Analytical results from confirmation soil sampling activities conducted following the removal action were used to complete a post-removal HHRA and ERA. The results of the post-removal risk assessments indicate the current site conditions are protective of human health and the environment for unrestricted use and exposure. Following the removal action, a site visit with members of the Restoration Advisory Board (RAB) and general public was conducted to present the post-removal site conditions.
Proposed Plan	2011	The Preferred Alternative for AOC J was presented in the Proposed Plan (PP). The public was invited to review the PP and provide comments prior to making the final decision.

* Documentation associated with the listed activities is available in the Administrative Record and provides detailed information used to support the no further action determination for AOC J. The relevant referenced information is also accessible by the hyperlinks in this document.

2.1.4 Distribution of Contamination

Evaluation of the nature and extent of contamination in environmental media and the assessment of human health and ecological risks for AOC J were conducted in 2000 as part of the Expanded PA/SI, in 2007 as part of the RI, and in 2011 as part of the Post-Removal Action Risk Assessment following the removal action. The nature and extent of contamination at AOC J is based on the analysis of groundwater, surface water, and sediment data collected during the Expanded PA/SI and RI, and soil data collected during the removal action confirmatory sampling (Figure 3). Chemical concentrations were compared to risk-based screening values for human health and ecological receptors. Constituents detected above screening criteria and background concentrations (for inorganics) are summarized in Table 2.

FIGURE 3
AOC J Sample Locations



Four VOCs (acetone, bromodichloromethane, chloroform, and trichloroethene [TCE]) were detected above risk-based screening criteria in groundwater. Acetone, bromodichloromethane, and chloroform were identified as common laboratory contaminants and not site-related. TCE was also detected in one sample just above the Federal Maximum Contaminant Level (MCL) and Puerto Rico Water Quality Standard (PRWQS), but was not detected in the subsequent sampling event. No VOCs were detected in soil, surface water or sediment above risk-based screening criteria. One SVOC (benzo(a)pyrene) was detected above a risk-based screening criterion, but in only one surface soil sample. No SVOCs were detected in groundwater, surface water, or sediment above risk-based screening criteria.

TABLE 2.
Soil, Groundwater, Surface Water, and Sediment Exceedances for AOC J

Environmental Media	COPC	Maximum Concentration Detected Above Screening Criteria and Background	Screening Criteria			
			West Vieques Background Value (Qa)	May 2010 RSL for Residential Soil	May 2010 RSL for Industrial Soil	Ecological Criteria
Soil	Semivolatile Organic Compounds (mg/kg)					
	Benzo(a)pyrene	0.0234J	--	0.015	0.21	--
	Total Inorganics (mg/kg)					
	Aluminum	13,000J	29,000	7,700	99,000	--
	Arsenic	0.66	2.2	0.39	1.6	18
	Chromium	7.3J	74	0.29	5.6	64
	Cobalt	8.1J	33	2.3	30	13
	Copper	24.1J	68	310	4,100	70
	Iron	25,400J	39,000	5,500	72,000	--
	Manganese	831	1,200	180	2,300	220
Vanadium	50.7J	130	39	520	130	
Environmental Media	COPC	Maximum Concentration Detected Above Screening Criteria and Background	Screening Criteria			
			NDW07MW08 Background	2002 PRG for Tap Water, Adjusted	Maximum Contaminant Level	2010 Puerto Rico Water Quality Standards, Class SG
Groundwater	Dissolved Inorganics (µg/L)					
	Arsenic	37.4	2.04 UJ	0.045	10	10
	Barium	580	344	255	2,000	--
	Cadmium	5.18	0.485J	1.82	5	5
	Chromium	13.3	0.696J	11	100	100
	Iron	6,180	801	1,090	--	--
	Manganese	26,000	24,400	87.6	--	--
	Lead	20.7	2J	15	15	15
	Selenium	41.3	9.55	18.2	50	50
	Thallium	43.1	2.54J	0.241	2	0.24
	Total Inorganics (µg/L)					
	Aluminum	72,000	116J	3,650	--	--
	Arsenic	54.6	10.2UJ	0.0448	10	10
	Barium	770	348	255	2,000	--
	Cadmium	3.9	1.78U	1.82	5	5
	Chromium	43	2.9J	11	100	100
	Iron	68,000	83.5U	1,090	--	--
	Manganese	27,000	24,300	87.6	--	--
	Lead	38.2	8.8U	15	15	15
	Selenium	86.7	10.5U	18.2	50	50
	Vanadium	330	2.24U	25.5	--	--
	Organic Compounds (µg/L)					
	Acetone	114	--	60.8	--	--
Bromodichloromethane	1	--	0.181	--	--	
Chloroform	8.5	--	0.617	--	--	
Trichloroethylene (TCE)	10.1	--	0.028	5	--	
bis(2-Ethylhexyl) phthalate	6.5	--	4.8	--	--	
Perchlorate	48	--	0.365	--	--	

TABLE 2.
Soil, Groundwater, Surface Water, and Sediment Exceedances for AOC J

Environmental Media	COPC	Maximum Concentration Detected Above Screening Criteria and Background	Screening Criteria			
			NDAJSW08 Background	2002 PRG for Tap Water, Adjusted	Marine Ecological Screening Criteria	
Surface Water	Total Inorganics (µg/L)					
	Beryllium	2.25	1.89U	7.3	0.53	
	Barium	385	321	255	--	
Environmental Media	COPC	Maximum Concentration Detected Above Screening Criteria and Background	Screening Criteria			
			NDAJSD08 Background	2002 PRG for Residential Soil	2002 PRG for Industrial Soil	Marine Ecological Screening Criteria
Sediment	Total Inorganics (mg/kg)					
	Barium	77	6.76J	540	6,700	20
	Organic Compounds (mg/kg)					
	p,p'-DDT	0.0043	NA	1.7	7	0.0033

The explosive perchlorate was detected above a risk-based screening criterion in one groundwater sample. However, the initial analytical detection method was prone to false positive detections. Perchlorate was not detected during the subsequent sampling event. No explosives were detected in soil, surface water, or sediment. The pesticide dichlorodiphenyltrichloroethane (DDT) was detected slightly above the ecological risk-based screening criterion in one sediment sample. However, pesticides were also detected in upstream background samples at similar concentrations and, therefore, were not likely site-related. No pesticides were detected in soil, groundwater, or surface water above risk-based screening criteria. No PCBs were detected above risk-based screening criteria in environmental media at the site.

Inorganic constituents detected above background concentrations and screening criteria in environmental media include aluminum, arsenic, barium, beryllium, cadmium, chromium, cobalt, iron, lead, manganese, selenium, and vanadium. Inorganic constituent concentrations in soil were generally only slightly above background levels and, therefore, likely associated with background. Arsenic, cadmium, lead, selenium, and thallium were detected above MCLs and PRWQS in groundwater. However, inorganic concentrations detected in groundwater are attributable to background and/or the result of high turbidity (over 10 nephelometric turbidity unit [NTU]) and suspended solids during sampling, geochemical conditions, and sea water intrusion. In addition, thallium concentrations reported were from an analytical method that tended to provide falsely elevated results and are not representative of actual site conditions.

2.1.5 Current and Potential Future Land and Resource Uses

The former NASD occupied approximately 8,000 acres, most of which are undeveloped. Military operations ceased on the former NASD in April 2001 and the land containing AOC J was transferred to the DOI. The site is located on a designated wildlife refuge where the future land use will remain the same. Groundwater beneath AOC J is classified by the Commonwealth of Puerto Rico as SG, where groundwater may be intended for use as a source of drinking water supply, agricultural use, and/or flows into waters that support ecological communities of exceptional ecological value. However, groundwater is not used

as a potable water source at or in the vicinity of AOC J, is brackish to saline because of sea water intrusion, and there are no plans for future potable use of groundwater in this area. No archeological or cultural resources are located within AOC J.

2.1.6 Summary of Site Risks

The potential for contaminant migration from wind erosion, surface runoff, and groundwater transport is minimal. The potential future sources of contamination (debris) and soils potentially posing unacceptable risk were removed from the site and the vegetative cover and relatively flat topography reduce the potential for migration.

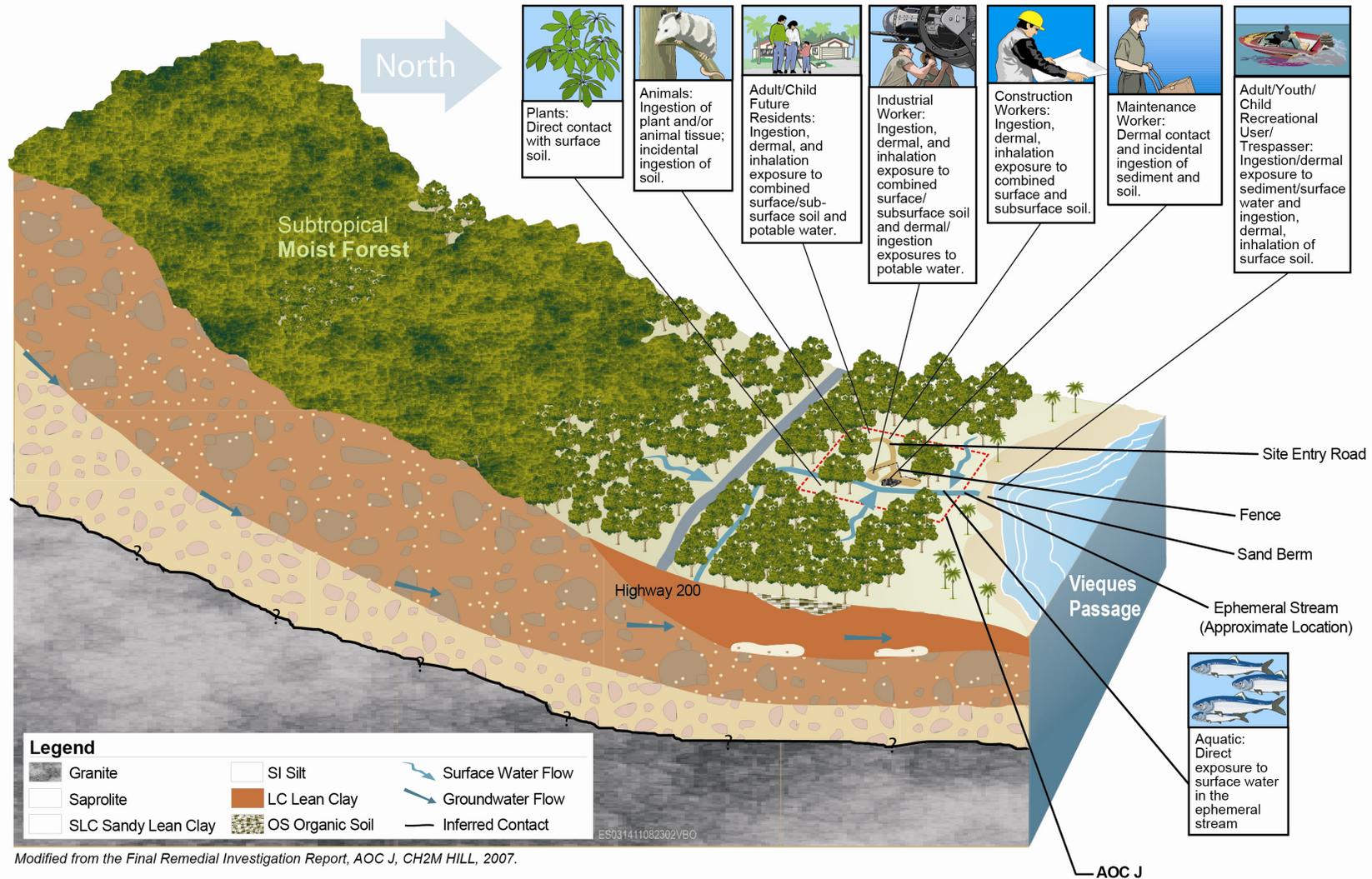
A conceptual site model (CSM) of AOC J is provided as Figure 4. Potential human health and ecological risks were quantitatively evaluated based on the receptor scenarios and potentially impacted media identified in the CSM.

Human Health Risk Assessment

Based on the human health CSM, human health risks were quantitatively evaluated for **potential human receptors**¹² exposed to surface soil, subsurface soil, groundwater, sediment, and surface water using reasonable maximum exposure (RME) assumptions. The RME assumes the highest level of human exposure that could reasonably be expected to occur. The potential non-cancer hazards, expressed as the hazard index (HI), and cancer risk estimates were calculated using RME exposure assumptions. For non-cancer effects, an HI represents the ratio between the reference dose and the RME dose for a person in contact with site constituents of potential concern (COPCs). An HI exceeding 1 indicates that adverse health effects may occur. For known or suspected carcinogens, acceptable exposure levels generally are concentration levels that represent an excess upper bound lifetime cancer risk to an individual between 10^{-4} (a 1 in 10,000 chance of developing cancer from site exposures) and 10^{-6} (a 1 in 1,000,000 chance of developing cancer from site exposures) using information on the relationship between dose and response.

Groundwater, sediment, and surface water data collected during the RI and previous investigations, and soil data collected during the post-removal confirmation sampling data, were used to quantitatively evaluate potential human health risks based on exposure to existing site media. All potential exposure pathways, media, and receptor scenarios evaluated in the HHRA result in a conclusion that there are **no unacceptable human health risks**¹³ attributed to CERCLA-related releases from historic Navy activities at AOC J (Table 3). Although potentially unacceptable cancer risks and non-cancer hazards were identified for the ingestion of groundwater by future residents (adult and child) and future industrial workers as a result of the presence of perchlorate, TCE, aluminum, arsenic, iron, manganese, and vanadium, the potential risks/hazards associated with these constituents are attributable to background or from false detections, and not historic Navy activities at AOC J. As noted previously, perchlorate and TCE were detected at low levels during only one sampling event and were not detected during the subsequent sampling event. In addition, perchlorate was likely a false detection based on the initial analytical method used, which was not used during the subsequent sampling event. Further, inorganic constituent concentrations in groundwater are attributable to background and/or are the result of high turbidity and suspended solids during sampling, geochemical conditions, and sea water intrusion.

FIGURE 4
AOC J Conceptual Site Model



Ecological Risk Assessment

An ERA was conducted for AOC J, consisting of Steps 1 through 3A, in accordance with Navy and EPA policy and guidance. In Step 1 (Problem Formulation), the goals, scope, and focus of the ERA were identified that included descriptions of the environmental setting (i.e., habitats, vegetation, wildlife, protected species), types and concentrations of chemicals in surface soil, surface water, and sediment, and potentially complete exposure pathways. This information was used to develop the **ecological CSM¹⁴** and **ecological assessment and measurement endpoints¹⁵**. Potentially complete pathways were identified for lower trophic level receptors (plants and soil invertebrates) and upper-trophic level receptors (birds and mammals) exposed to surface soil. Potentially complete pathways were also identified for aquatic receptors (benthic invertebrates and fish) on a periodic basis, due to the ephemeral nature of the stream.

TABLE 3
Receptors With Risk and Hazard Estimates Above Regulatory Levels at AOC J

Receptor	Media	Pathway	Constituent of Concern	Exposure Point Concentration (µg/L)	RME Cancer Risk	Cancer Slope Factor (mg/kg-day ⁻¹)	RME Non Cancer Hazard	Non-Cancer Toxicity Factor - Reference Dose (mg/kg-day)
Future Adult Resident		Ingestion	Perchlorate	24	-	-	22	0.00003
			Aluminum	7,000	-	-	2	1
			Arsenic	55	8x10 ⁻⁴	1.5	5	0.0003
			Iron	68000	-	-	6	0.3
			Manganese	19000	-	-	26	0.02
			Vanadium	220	-	-	6	0.001
Future Resident Child	Groundwater	Ingestion	TCE	7.3	2x10 ⁻⁵	0.4	2	0.0003
			Perchlorate	24	-	-	51	0.00003
			Aluminum	72000	-	-	5	1
			Arsenic	55	4.5x10 ⁻⁴	1.5	12	0.0003
			Iron	68000	-	-	14	0.3
			Manganese	19000	-	-	61	0.02
			Vanadium	220	-	-	14	0.001
Future Industrial Worker		Ingestion	Perchlorate	24	-	-	8	0.00003
			Arsenic	55	3x10 ⁻⁴	1.5	2	0.0003
			Iron	68000	-	-	2	0.3
			Manganese	19000	-	-	9	0.02
			Vanadium	220	-	-	2	0.001

In Step 2, hazard quotients (HQs) were calculated to characterize the potential for constituents to pose unacceptable ecological risk using conservative exposure assumptions. HQs represent a ratio of the exposure level to an ecological effect level and are an estimate of potential risk. Maximum soil, surface water, and sediment constituent concentrations were used in Step 2 to estimate potential exposures to upper and lower trophic level ecological receptors selected to represent the assessment endpoints at AOC J. Upper trophic level effects were determined using a food web model that estimated the concentration of each **bioaccumulating chemical**¹⁶ in each relevant dietary component and comparing the total dietary intake of the chemical to wildlife **toxicity reference values**¹⁷ (TRVs). TRVs were based on chronic No Observed Adverse Effect Levels (NOAELs) and chronic Lowest Observed Adverse Effect Levels (LOAELs) obtained from scientific literature. Only constituents with the potential to bioaccumulate were evaluated for exposures via food web modeling. For lower trophic level receptors, the exposure concentrations for soil were screened against **ecological soil screening levels**¹⁸ (eco-SSLs) developed by USEPA, or alternate regulatory-approved screening values as provided in the **Master Ecological Risk Assessment Protocol for Vieques**¹⁹ if eco-SSLs were not available. Surface water screening values used were the most conservative of the Puerto Rico Water Quality Standards Regulation and the US National Recommended Water Quality Criteria (NRWQC). Sediment screening values were selected from Long et. al. (1995) and other regulatory-approved screening values as provided in the **Master Ecological Risk Assessment Protocol for Vieques**²⁰ if values from Long et. al. (1995) were not available. Chemicals with HQs greater than 1 were identified as **ecological COPCs**²¹ for further evaluation in Step 3 of the ERA.

In **Step 3A**²², the conservative exposure assumptions employed for Step 2 were refined and risk estimates were recalculated using more realistic assumptions including mean media concentrations, bioaccumulation factors, and exposure parameters. Other considered factors included comparison to background concentrations, other accepted ecological screening values in the scientific literature, frequency of detection, frequency and magnitude of screening value exceedances, and limited spatial distribution of the COPCs.

The Step 3A refinement resulted in no constituents of concern (COCs) being identified for either upper or lower trophic level receptors. However, due to the uncertainty associated with the debris being a potential future source of contamination, a removal action and confirmatory sampling were conducted to re-assess potential ecological risks from soil exposure. Based on the results of post-removal confirmatory sampling, the ERA resulted in no COCs identified at AOC J. Thus, risks to ecological receptors are acceptable at AOC J, and no further evaluation or remediation is warranted with respect to ecological receptors.

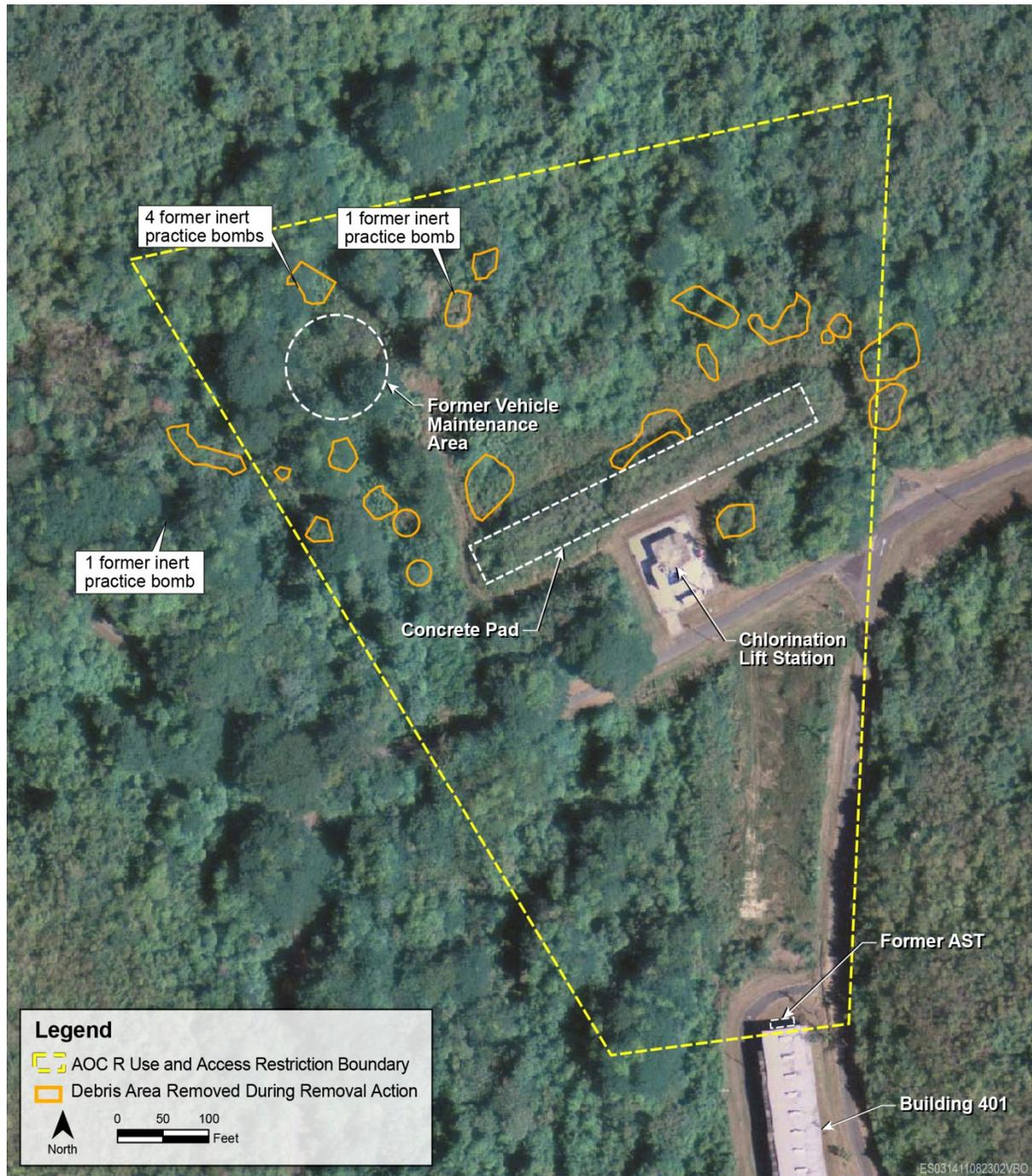
2.2 Area of Concern R

2.2.1 Site Description and History

AOC R comprises approximately 12 acres located adjacent to Highway 200 on the former NASD. The site, illustrated in Figure 5, was used as a construction staging area and public works operational area from approximately 1965 to 1971. In the late 1960s, a carpentry shop and an enlisted personnel club were located on a large, rectangular concrete pad within the site. The concrete pad was present before the Navy owned the area and its use during that time is unknown. Light vehicle maintenance activities, such as oil changes, were conducted just northwest of the concrete pad. An aboveground storage tank (AST) was once located at

the site. Completely inert practice bombs were identified at three locations, and several debris piles were also located around the site. A potable water lift/ chlorination building constructed and operated by the Puerto Rico Aqueduct and Sewer Authority (PRASA) also exists at the site. PRASA's potable water lift/chlorination building is not associated with Navy activities and was not investigated as part of AOC R.

FIGURE 5
AOC R Site Location Map



In preparation for transfer of portions of the former NASD to the Municipality of Vieques (MOV), a subjective boundary was surveyed and defined as a “Remedial Land Use Restriction” within AOC R. As set forth in the Quitclaim Deed, the MOV agreed that use and access to the area defined by the Remedial Land Use Restriction shall be limited to non-residential until CERCLA related activities were completed and final land use(s) determined.

2.2.2 Site Characteristics

AOC R is relatively flat and slopes slightly to the north and northwest toward the coastline of the Vieques Passage. The site is vegetated with thorn shrubs and coastal forest and serves as a **habitat for wildlife**²³ such as lizards and birds. The sides of the concrete pad provide shade, foraging areas and cover for the common, garden, and spotted anoles, which are abundant. A typically dry ephemeral stream is located immediately adjacent to the western portion of the site that drains to the Vieques Passage.

Groundwater at AOC R is first encountered within unconsolidated sands of the alluvium at elevations between 6.3 to 1.7 feet above mean sea level) (amsl). Groundwater flows north to northwestward toward the coastline with an average hydraulic gradient of 0.005 feet per foot (ft/ft) and at an estimated groundwater flow velocity of approximately 15 feet per year (ft/year).

2.2.3 Previous Investigations and Removal Action

Environmental investigations at AOC R were initiated with an EBS, conducted in 2000 to identify potential contaminants based on historical uses at the former public works and motor vehicle areas. Subsequent investigations, including an RI that incorporated an HHRA and an ERA, were conducted at the site. A removal action was conducted during the RI to eliminate potential ongoing and future sources of releases (inert practice bombs, debris piles, and contaminated soil); confirmatory sampling and the HHRA and ERA were conducted to ensure the post-removal site conditions are protective of human health and the environment. Table 4 summarizes previous investigations and the removal action conducted at AOC R.

TABLE 4
Previous Investigations and Removal Action at AOC R

Previous Investigation/ Removal Action*	Date	Investigation Activities
EBS	2000	Records review and personnel interviews were conducted to disclose relevant information regarding the environmental condition of the site prior to property transfer of the former NASD. Based on the identification of a construction staging area and information that the area was used as temporary public works and motor vehicle areas from approximately 1965 to 1971, AOC R was recommended for an environmental investigation.
Background Investigation	2000	A background study was conducted in the western portion of Vieques to develop a set of background values for inorganic constituents in the soil to help distinguish inorganic concentrations that occur naturally in environmental media from those that may be present as a result of a site-related release. The background data were collected specifically from the western portion of Vieques to represent soil types similar to those where environmental sites are located in the Former NASD. The background inorganic constituent concentrations were used for comparison with soil inorganic constituent concentrations collected during the environmental investigations at AOC R.

TABLE 4
Previous Investigations and Removal Action at AOC R

Previous Investigation/ Removal Action*	Date	Investigation Activities
Expanded Preliminary Assessment (PA)/Site Investigation (SI)	2002	Thirty-four surface soil samples were collected during the Preliminary Assessment/Site Investigation (PA/SI) and analyzed for inorganic constituents, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and explosives. The analytical results ²⁴ identified the presence of seven inorganics and five SVOCs at concentrations above EPA screening values. Further investigation was recommended to determine the nature and extent of contamination.
Engineering Evaluation/Cost Analysis for Area of Concern J and R, and Solid Waste Management Unit 7	2005	In 2005, four debris areas ²⁵ were identified at AOC R during a site visit. As a result, an Engineering Evaluation/Cost Analysis (EE/CA) was completed to develop and evaluate three removal action alternatives ²⁶ for the debris areas. Off-site disposal followed by site restoration was the selected removal action for AOC R.
Pre-Removal Waste Characterization Sampling	2006	In 2006, nine pre-removal waste characterization soil samples from within the debris areas were collected to perform a pre-removal HHRA and ERA. The pre-removal waste characterization soil samples were analyzed for VOCs, SVOCs, pesticides, PCBs, explosives, and inorganics.
Pre-Removal Waste Characterization Human Health and Ecological Risk Assessments for AOC R	2008	<p>A pre-removal HHRA and ERA were conducted to determine the areas of soil requiring excavation (together with the debris) as well as the appropriate disposal options for the soil. The soil dataset²⁷ for the HHRA and the soil dataset²⁸ for the ERA comprised surface and subsurface soil samples collected from within the debris areas during the PA/SI, the RI, and pre-removal waste characterization sampling.</p> <p>Potentially unacceptable human health risks²⁹ were identified for future adult and child residents from ingestion, dermal contact, and inhalation due to exposure to soil within portions of the debris areas and to future maintenance workers from ingestion, dermal contact, and inhalation due to exposure to surface soil within portions of the debris areas.</p> <p>Potentially unacceptable ecological risks³⁰ were identified for receptors exposed to pesticides and SVOCs due to exposure to soil within portions of the debris areas.</p>
Determination of the Disposition of Excavated Soils at AOC R Technical Memorandum	2008	<p>Results of the pre-removal HHRA and ERA were used to determine areas of soil requiring removal (for unrestricted use), as well as the appropriate soil disposal options for AOC R. Four disposition options³¹ were considered, based on results of the pre-removal HHRA and ERA. Option 4, a combination of the other three options, was selected.</p> <p>A soil disposition map³² identified the disposal determination by location (i.e., to remain onsite, use as daily cover at the Vieques Municipal Landfill) for site soils to be excavated with the debris.</p>
Final Completion Report	2010	<p>Between February and April 2009, approximately 3,952 tons of excavated soil and debris were removed. The debris consisted of railroad ties, metal pipes, wooden power poles, tires, corrugated roofing sheet material, other miscellaneous metal debris, and inert munitions-related items. The removal action eliminated potential future sources of contamination and areas of soil potentially posing unacceptable risks to human and/or ecological receptors.</p> <p>Following completion of the removal action, confirmation soil samples were collected and used, in part, to complete a post-removal HHRA and ERA that was included in the RI. Following the removal action, a site visit with members of the Restoration Advisory Board (RAB) and general public was conducted to present the post-removal site conditions.</p>

TABLE 4
Previous Investigations and Removal Action at AOC R

Previous Investigation/ Removal Action*	Date	Investigation Activities
Remedial Investigation	2010	Soil, groundwater, sediment, and surface water samples were collected during the RI and analyzed for VOCs, SVOCs, pesticides, PCBs, explosives, and inorganics. In addition, those samples collected adjacent to the former AST were analyzed for total petroleum hydrocarbons (TPH) gasoline-range organics (GRO), TPH diesel-range organics (DRO) and TPH oil-range organics (ORO). Results ³³ from the PA/SI, RI, removal action confirmation sampling were used to evaluate the nature and extent of contamination and conduct a HHRA and ERA for existing conditions at AOC R. Based on the results of the RI, no additional investigation or action was recommended.
Proposed Plan	2011	The Preferred Alternative for AOC R was presented in the Proposed Plan (PP). The public was invited to review the PP and provide comments prior to making the final decision.

* Documentation associated with the listed activities is available in the Administrative Record and provides detailed information used to support the no further action determination for AOC R. The relevant referenced information is also accessible by the hyperlinks in this document.

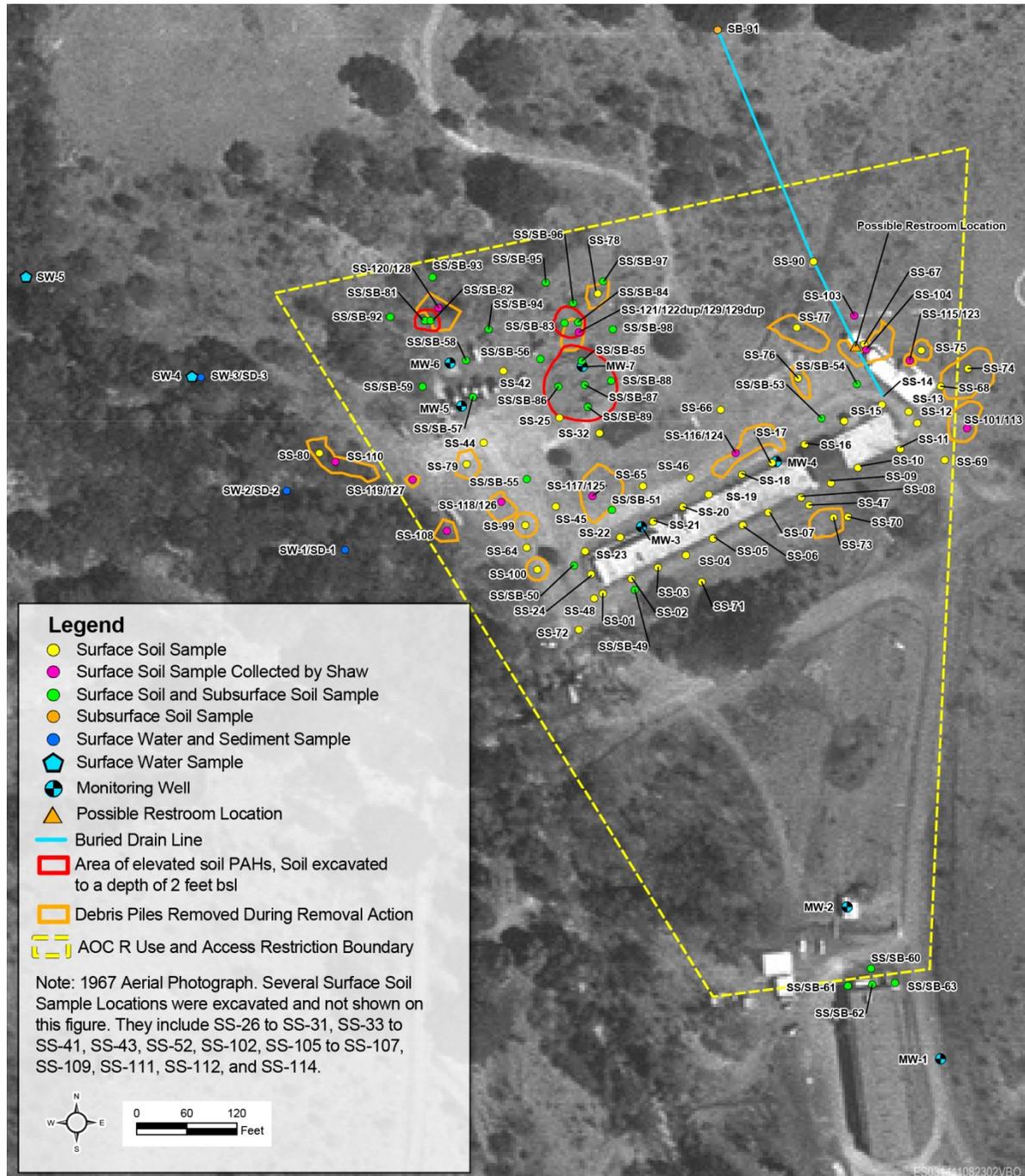
2.2.4 Distribution of Contamination

Evaluation of the nature and extent of contamination in environmental media at AOC R, and the assessment of human health and ecological risks, were conducted in 2010 as part of the RI, following completion of the removal action. The nature and extent of contamination at AOC R is based on the analysis of soil, groundwater, sediment, and surface water data collected during the PA/SI and RI (excluding data from soil removed during the removal action) and the removal action confirmatory sampling (Figure 6). Chemical concentrations were compared to risk-based screening criteria for human health and ecological receptors and Federal and Commonwealth of Puerto Rico water quality standards. Constituents detected above screening criteria and background concentrations (for inorganics) are summarized in Table 5.

The VOCs methylene chloride (in soil) and chloroform (in surface water) exceeded screening criteria at AOC R; however, these constituents were determined not to be due to site-related releases. Methylene chloride is identified as a likely common laboratory contaminant and chloroform is a common byproduct of potable water chlorination and is likely the result of discharge from the potable water lift/chlorination station adjacent to the site. No VOCs were detected in groundwater or sediment above risk-based screening criteria.

Several SVOCs exceeded screening criteria in soil at AOC R; however, most were polycyclic aromatic hydrocarbons (PAHs) at concentrations much lower than pre-removal concentrations. Benzo(a)pyrene was the most frequently observed PAH in soil above a screening criterion. Atrazine was detected in soil, but its concentrations were likely associated with normal herbicide use to control weeds, not the result of a spill or from improper storage, disposal, or use. Carbazole, 4-nitroaniline, and 2,4-DNT were observed in soil above site-specific Soil Screening Levels (SSLs) based on leaching to groundwater; however, none was observed in groundwater.

FIGURE 6
AOC R Sample Locations



No PAHs were observed in groundwater, sediment, or surface water. Only bis(2-ethylhexyl)phthalate and 4-nitrophenol were observed above screening criteria in groundwater; however, bis(2-ethylhexyl)phthalate is identified as a likely common laboratory contaminant and not a likely site-related constituent, and 4-nitrophenol was used as a fungicide and its occurrence is attributable to normal pesticide application and not the result of a spill or from improper storage, disposal or use.

Other pesticides were observed above screening criteria in soil and sediment at AOC R; however, concentrations are consistent with concentrations detected across multiple sites on Vieques and attributed to normal pesticide application. Therefore, pesticides detected at AOC R were most likely a result of normal pesticide application, not a CERCLA-related release.

TABLE 5
Soil, Groundwater, Surface Water, and Sediment Exceedances for AOC R

Environmental Media	COPC	Maximum Concentration Detected Above Screening Criteria and Background	Screening Criteria			
			West Vieques Background Value (Qa)	May 2010 RSL for Residential Soil	May 2010 RSL for Industrial Soil	Ecological Criteria
Soil	Semivolatile Organic Compounds (mg/kg)					
	benzo(a)anthracene	1.83	--	0.15	2.1	--
	benzo(a)pyrene	0.75	--	0.015	0.21	--
	benzo(b)fluoranthene	1.46	--	0.15	2.1	--
	dibenz(a,h)anthracene	0.163 J	--	0.015	0.21	--
	indeno(1,2,3-cd)pyrene	0.51	--	0.15	2.1	--
	Total Inorganics (mg/kg)					
	Aluminum	34,400	29,000	7,700	99,000	--
	Arsenic	9.8	2.2	0.39	1.6	18
	Chromium	106J	74	0.29	5.6	64
	Cobalt	27.8	33	2.3	30	13
	Iron	40,000	39,000	5,500	72,000	--
	Manganese	4,500	1,200	180	2,300	220
Vanadium	143J	130	39	520	130	
Environmental Media	COPC	Maximum Concentration Detected Above Screening Criteria and Background	Screening Criteria			
			MW01 Background	May 2010 RSL for Tap Water, Adjusted	Maximum Contaminant Level	Puerto Rico Water Quality Standards, Class SG
Groundwater	Dissolved Inorganics (µg/L)					
	Arsenic	1.9J	--	0.045	10	10
	Cobalt	3.2	--	1.1	--	--
	Iron	3,930	--	2,600	--	--
	Manganese	1,980	--	88	--	--
	Vanadium	62	--	18	--	--
	Total Inorganics (µg/L)					
	Aluminum	5,860	--	3,700	--	--
	Arsenic	2.6J	--	0.045	10	10
	Chromium	23	--	0.043	100	100
	Cobalt	3.3	--	1.1	--	--
	Iron	14,300	--	2,600	--	--
	Manganese	2,090	--	88	--	--
	Vanadium	61	--	18	--	--
	Organic Compounds (µg/L)					
4-Nitrophenol	0.39J	--	0.12	--	--	
bis(2-Ethylhexyl) Phthalate	62J	--	4.8	6.0	12	

TABLE 5
Soil, Groundwater, Surface Water, and Sediment Exceedances for AOC R

Environmental Media	COPC	Maximum Concentration Detected Above Screening Criteria and Background	Screening Criteria			
			NDAJSW08 Background	May 2010 RSL for Tap Water, Adjusted	Fresh Water Ecological Criteria	
Surface Water	Dissolved Inorganics (µg/L)					
	Arsenic	4.7J	--	0.045	150	
	Barium	289	--	730	4	
	Cobalt	3.8J	--	1.1	23	
	Manganese	2,230	--	88	120	
	Total Inorganics (µg/L)					
	Arsenic	3.3J	--	0.045	150	
	Barium	314	--	730	4	
	Cobalt	4.8J	--	1.1	23	
	Iron	1,190	--	2,600	1,000	
	Manganese	2,390	--	88	120	
Organic Compound (µg/L)						
Chloroform	3.0J	--	0.19	28		
Environmental Media	COPC	Maximum Concentration Detected Above Screening Criteria and Background	Screening Criteria			
			West Vieques Background Value (Qa)	May 2010 RSL Residential Soil	May 2010 RSL for Industrial Soil	Fresh Water Ecological Criteria
Sediment	Total Inorganics (mg/kg)					
	Barium	95J	--	1,500	19,00	20
	Chromium	2.4	--	0.29	5.6	43
	Cobalt	7.0	--	2.3	30	50
	Iron	7,430	--	5,500	72,000	20,000
	Manganese	731J	--	180	2,300	460

No PCBs were observed above screening criteria in the environmental media at AOC R. Perchlorate was the only explosive constituent observed in soil and groundwater at the site, but all concentrations were below regulatory screening criteria. No explosives were detected in surface water or sediment.

Inorganic constituents detected above background concentrations and screening criteria in environmental media include aluminum, antimony, arsenic, barium, chromium, cobalt, copper, iron, lead, manganese, nickel, selenium, vanadium, and zinc. Copper exceeded screening criteria primarily in soil samples in the area of the concrete pad, but was below screening criteria in all other environmental media. All other inorganic constituent concentrations were generally only slightly above background levels and, therefore, likely associated with background. For example, although aluminum, iron, and manganese can be associated with the metal debris formerly present at the site, these inorganics are also commonly associated with the chemical weathering of volcanic rocks and can be highly variable because of the occurrence of aluminum rich clays and iron and manganese oxides.

2.2.5 Current and Potential Future Land and Resource Uses

The former NASD occupied approximately 8,000 acres, most of which are undeveloped. Military operations ceased on the former NASD in April 2001 and the land containing AOC R was transferred to the MOV. Public access to the site is currently restricted. There has been no evidence of public access to the site except for access to the potable water lift/chlorination building. Groundwater beneath AOC R is classified by the Commonwealth of Puerto Rico as SG, where groundwater may be intended for use as a source of drinking water supply, agricultural use, and/or flows into waters that support ecological communities of exceptional ecological value. However, groundwater is not used as a potable water source at or in the vicinity of AOC R, and there are no plans for future potable use of groundwater in this area. No archeological sites or districts are located at AOC R.

2.2.6 Summary of Site Risks

The potential for contaminant migration from wind erosion, surface runoff, and groundwater is minimal. PAHs and inorganics are not readily mobile and tend to bind to the soil. In addition, the potential future sources of contamination (debris) and soils potentially posing unacceptable risk were removed from the site and the vegetative cover and relatively flat topography reduce the potential for migration.

A CSM of AOC R is provided as Figure 7. Potential human health and ecological risks were quantitatively evaluated based on the receptor scenarios and potentially impacted media identified in the CSM. The discussion below focuses on those potential human health and ecological risks calculated to be above regulatory thresholds.

Human Health Risk Assessment

Based on the CSM, human health risks were quantitatively evaluated for **potential human receptors**³⁴ exposed to surface soil, total soil (surface and subsurface), groundwater, sediment, and surface water using RME concentrations. The RME assumes the highest level of human exposure that could reasonably be expected to occur. The potential non-cancer hazards, expressed as the HI, and cancer risk estimates were calculated using RME exposure assumptions. For non-cancer effects, an HI represents the ratio between the reference dose and the RME dose for a person in contact with site COPCs. An HI exceeding 1 indicates that adverse health effects may occur. For known or suspected carcinogens, acceptable exposure levels generally are concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between 10^{-4} (a 1 in 10,000 chance of developing cancer from site exposures) and 10^{-6} (a 1 in 1,000,000 chance of developing cancer from site exposures) using information on the relationship between dose and response.

Following the removal action conducted in 2009, post-excavation confirmation sampling data, as well as data from other areas of the site collected during the RI and previous investigations, were used to quantitatively evaluate potential human health risks based on exposure to existing site media. All potential exposure pathways, media, and receptor scenarios evaluated in the HHRA result in the conclusion that there are **no unacceptable human health risks**³⁵ attributed to CERCLA-related releases from historic Navy activities at AOC R (Table 6). Although the non-cancer HI is greater than 1 for potable use of groundwater by the hypothetical future child resident as a result of the presence of aluminum, iron, and manganese, the potential risks/hazards associated with these inorganic constituents are attributable to background and not historic Navy activities.

FIGURE 7
AOC R Conceptual Site Model

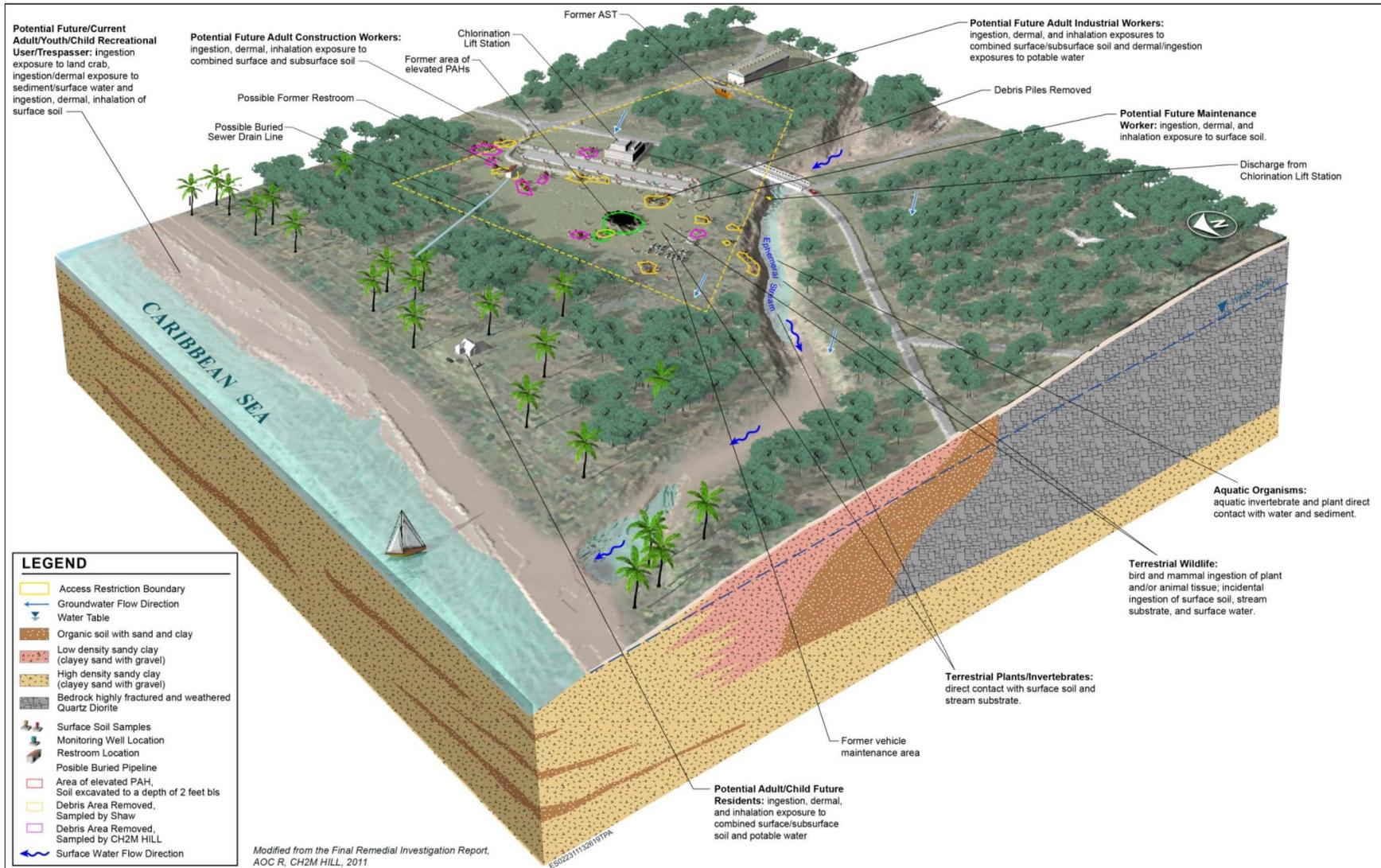


TABLE 6
Receptors With Risk and Hazard Estimates Above Regulatory Levels at AOC R

Receptor	Media	Pathway	Constituent of Concern	Exposure Point Concentration (µg/L)	RME Non Cancer Hazard	Non-Cancer Toxicity Factor - Reference Dose (mg/kg-day)
Future Child Resident	Groundwater	Total Ingestion and Dermal Contact	Aluminum	5,900	0.4*	1 (ingestion and dermal)**
			Iron	14,000	1.3	0.7 (ingestion and dermal) **
			Manganese	2,100	1.1	0.14 (dermal) and 0.0056 (ingestion) ***

* Cumulative hazard to the target organ-specific nervous system (total HI of 1.5)

** Source: EPA Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites

*** Source: Integrated Risk Information System (IRIS)

Ecological Risk Assessment

An ERA was conducted for AOC R, consisting of Steps 1 through 3A, in accordance with Navy and EPA policy and guidance. In Step 1, the goals, scope, and focus of the ERA were identified which included descriptions of the environmental setting (i.e., habitats, vegetation, wildlife, protected species), types and concentrations of chemicals in surface soil, surface water, and surface sediment, and potentially complete exposure pathways. This information was used to develop the **ecological CSM**³⁶ and **ecological assessment and measurement endpoints**³⁷. Potentially complete pathways were identified for lower trophic level receptors (plants and soil invertebrates) and upper-trophic level receptors (birds and mammals) exposed to surface soil. Potentially complete pathways were also identified for aquatic receptors (benthic invertebrates); however, because of the ephemeral nature of the adjacent stream these aquatic exposure pathways are limited.

In Step 2, HQs were calculated to characterize the potential for constituents to pose unacceptable ecological risk using conservative exposure assumptions. HQs represent a ratio of the exposure level to an ecological effect level, and are an estimate of potential risk. Maximum soil, surface water, and sediment constituent concentrations were used in Step 2 to estimate potential exposures to upper and lower trophic level ecological receptors selected to represent the assessment endpoints at AOC R. Upper trophic level effects were determined using a food web model that estimated the concentration of each **bioaccumulating chemical**³⁸ in each relevant dietary component, and comparing the total dietary intake of the chemical to wildlife **TRV**³⁹. TRVs were based on chronic NOAELs and chronic LOAELs obtained from scientific literature. Only constituents with the potential to bioaccumulate were evaluated for exposures via food web modeling. For lower trophic level receptors, the exposure concentrations for soil were screened against **eco-SSLs**⁴⁰ developed by EPA or alternate regulatory-approved screening values as provided in the **Master Ecological Risk Assessment Protocol for Vieques**⁴¹ if eco-SSLs were not available. Surface water screening values used were the most conservative of the Puerto Rico Water Quality Standards Regulation and the US NRWQC. Freshwater sediment screening values were selected from freshwater sediment consensus values (MacDonald et. al., 2000) and other regulatory-approved screening values as provided in the **Master Ecological Risk Assessment Protocol for Vieques**⁴² if values from MacDonald et. al. (2000) were not available. Chemicals with HQs greater than 1 were identified as **ecological COPCs**⁴³ for

further evaluation in Step 3 of the ERA. No COPCs were identified for upper trophic level receptors. Identified COPCs for lower trophic level receptors included VOCs, SVOCs, inorganic constituents, and TPHs in surface soil, and inorganic constituents in surface water.

In **Step 3A⁴⁴**, the conservative exposure assumptions employed for Step 2 were refined and risk estimates were recalculated using more realistic assumptions including mean media concentrations, bioaccumulation factors, and exposure parameters. Other considered factors included comparison to background concentrations, other accepted ecological screening values in the scientific literature, frequency of detection, frequency and magnitude of screening value exceedance, and limited spatial distribution of the COPCs.

The Step 3A refinement resulted in no COCs being identified for either upper or lower trophic level receptors. Thus, risks to ecological receptors are acceptable at AOC R, and no further evaluation or remediation is warranted with respect to ecological receptors.

2.3 Solid Waste Management Unit 7

2.3.1 Site Description and History

SWMU 7, the Former Quebrada Disposal Site, comprises approximately 10 acres located adjacent to Highway 200 on the former NASD. The site, illustrated in Figure 8, was used as a disposal area for debris such as tires, sheet metal, empty containers (e.g., drums, cans, and bottles), used batteries, and construction rubble from the early 1960s and late 1970s. No activity at SWMU 7 has been reported since the late 1970s as the site became overgrown and not readily accessible.

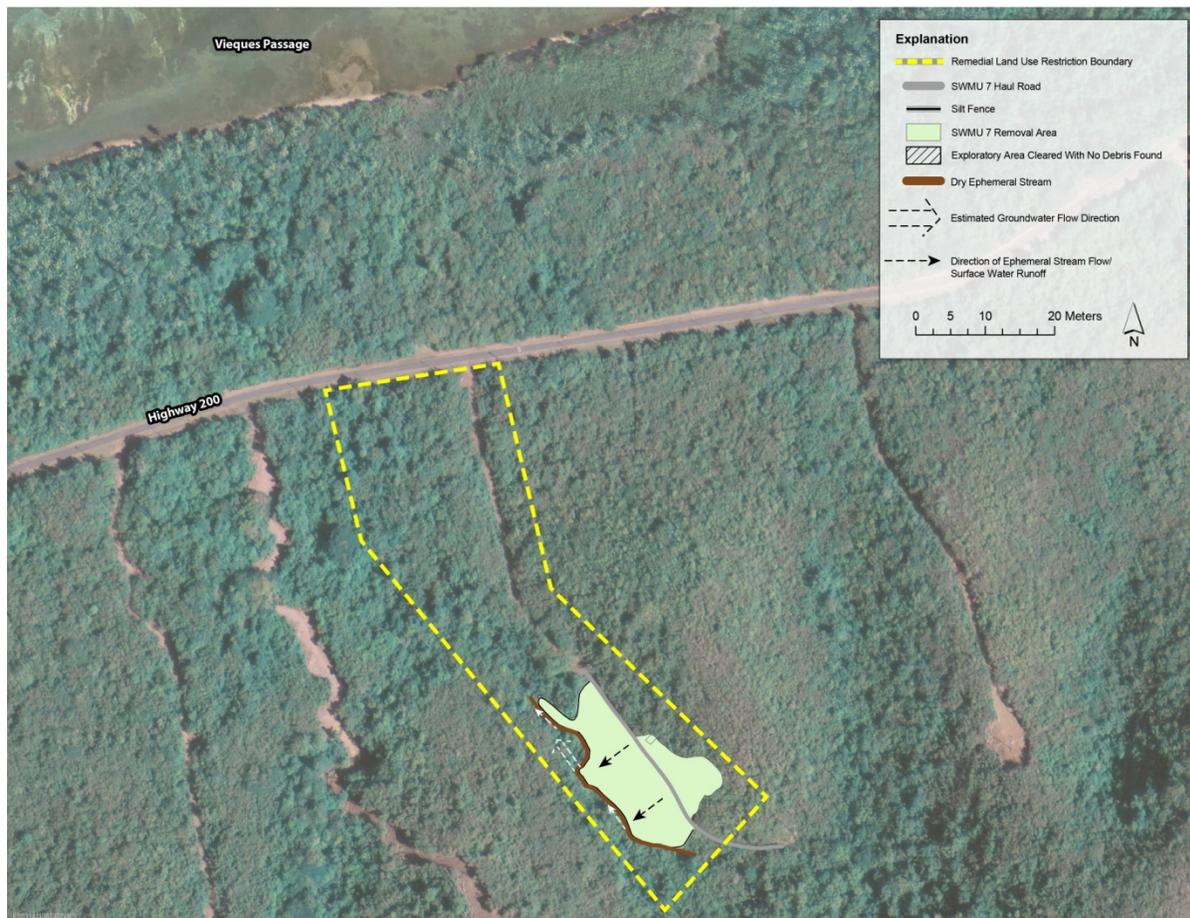
In preparation for transfer of portions of the former NASD to the MOV, a subjective boundary was surveyed and defined as the “Remedial Land Use Restriction” boundary within SWMU 7. As set forth in the Quitclaim Deed, the MOV agreed that use and access to the area defined by the Remedial Land Use Restriction shall be limited to non-residential until CERCLA related activities were completed and final land use(s) determined.

2.3.2 Site Characteristics

SWMU 7 is heavily vegetated and characterized by a gently sloping hill toward the north, but with very steep embankments along an ephemeral stream. The ground elevation ranges from approximately 105 to 25 feet above msl. The ephemeral stream runs north toward the Vieques Passage and surface water is only present during a rainstorm.

Groundwater at SWMU 7 is first encountered within alluvial deposits of silty sand and within weathered granodiorite (saprolite) at depths between 33 to 72 feet below ground surface (bgs). Groundwater flows northwestward toward the coastline.

FIGURE 8
SWMU 7 Site Map



2.3.3 Previous Investigations and Removal Action

Environmental investigations at SWMU 7 were initiated with a Confirmation Study, conducted in 1986, to determine if specific hazardous materials contaminated the environment. Subsequent investigations, including a Remedial Investigation (RI) that incorporated a Human Health Risk Assessment (HHRA) and an Ecological Risk Assessment (ERA), were conducted at the site. A removal action was conducted following the RI to eliminate potential ongoing and future sources of releases (debris piles and contaminated soil); confirmatory sampling and post-removal-action risk assessments were conducted to ensure the post-removal site conditions are protective of human health and the environment. Table 7 summarizes previous investigations and the removal action conducted at SWMU 7.

TABLE 7
Previous Investigations and Removal Action at SWMU 7

Previous Investigation// Removal Action*	Date	Investigation Activities
Confirmation Study	1986	Three groundwater and sediment samples and six soil samples were collected from SWMU 7 (referred to as Site 1 in the confirmation study report) and analyzed for pH, oil and grease, volatile organic compounds (VOCs), xylenes, methyl ethyl ketone (MEK), methyl isobutyl ketone (MIBK), ethylene dibromide (EDB), total and hexavalent chromium, and lead. The analytical results ⁴⁵ found that cadmium, chromium, and nickel exceeded regulatory screening criteria in groundwater.
Environmental Baseline Survey	2000	Records review and personnel interviews were conducted to disclose relevant information regarding the environmental condition of the site prior to property transfer of the former NASD. SWMU 7 was identified as a potentially contaminated site that was recommended for an environmental investigation.
Phase I Preliminary Assessment/Site Inspection	2000	Six surface soil and three sediment and groundwater samples were collected during the Phase I Preliminary Assessment (PA)/Site Inspection (SI) and analyzed for VOCs, semivolatiles organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), explosives, and inorganic constituents. The analytical results ⁴⁶ identified the presence of benzo(a)pyrene and inorganics at concentrations above EPA screening values in soil, and inorganics at concentrations above EPA screening values in groundwater. Inorganic constituents exceeding screening criteria in sediment were determined to be attributable to background. Further investigation was recommended to determine the nature and extent of contamination and assess potential risks to human health and the environment.
Background Investigation	2000	A background study was conducted in the western portion of Vieques to develop a set of background values for inorganic constituents in the soil to help distinguish inorganic concentrations that occur naturally in environmental media from those that may be present as a result of a site-related release. The background data were collected specifically from the western portion of Vieques to represent soil types similar to those where environmental sites are located in the Former NASD. The background inorganic constituent concentrations were used for comparison with soil inorganic constituent concentrations collected during the environmental investigations at SWMU 7.
Remedial Investigation	2003-2007	Soil and groundwater samples were collected during the Remedial Investigation (RI) and analyzed for VOCs, SVOCs, pesticides, PCBs, explosives, and inorganics. Analytical results ⁴⁷ from the PA/SI and the RI suggested that there were no unacceptable risks to human health and the environment; however, due to uncertainty in the conclusions (samples were collected primarily adjacent to the debris piles rather than directly through the debris piles) and because of the presence of potential contaminant sources (debris), a removal action was recommended.
Engineering Evaluation/ Cost Analysis for Area of Concern J and R, and Solid Waste Management Unit 7	2005	Due to the uncertainty in the conclusions of the RI and presence of potential future sources of releases (debris), an Engineering Evaluation/Cost Analysis (EE/CA) was completed to develop and evaluate three removal action alternatives ⁴⁸ for the debris areas ⁴⁹ at SWMU 7. Off-site disposal followed by site restoration was the selected removal action for SWMU 7.
Pre-Removal Waste Characterization Sampling	2006	In 2006, 15 pre-removal waste characterization soil samples from within the debris areas were collected to perform a pre-removal HHRA and ERA. The pre-removal waste characterization soil samples were analyzed for VOCs, SVOCs, pesticides, PCBs, explosives, and inorganic constituents.

TABLE 7
Previous Investigations and Removal Action at SWMU 7

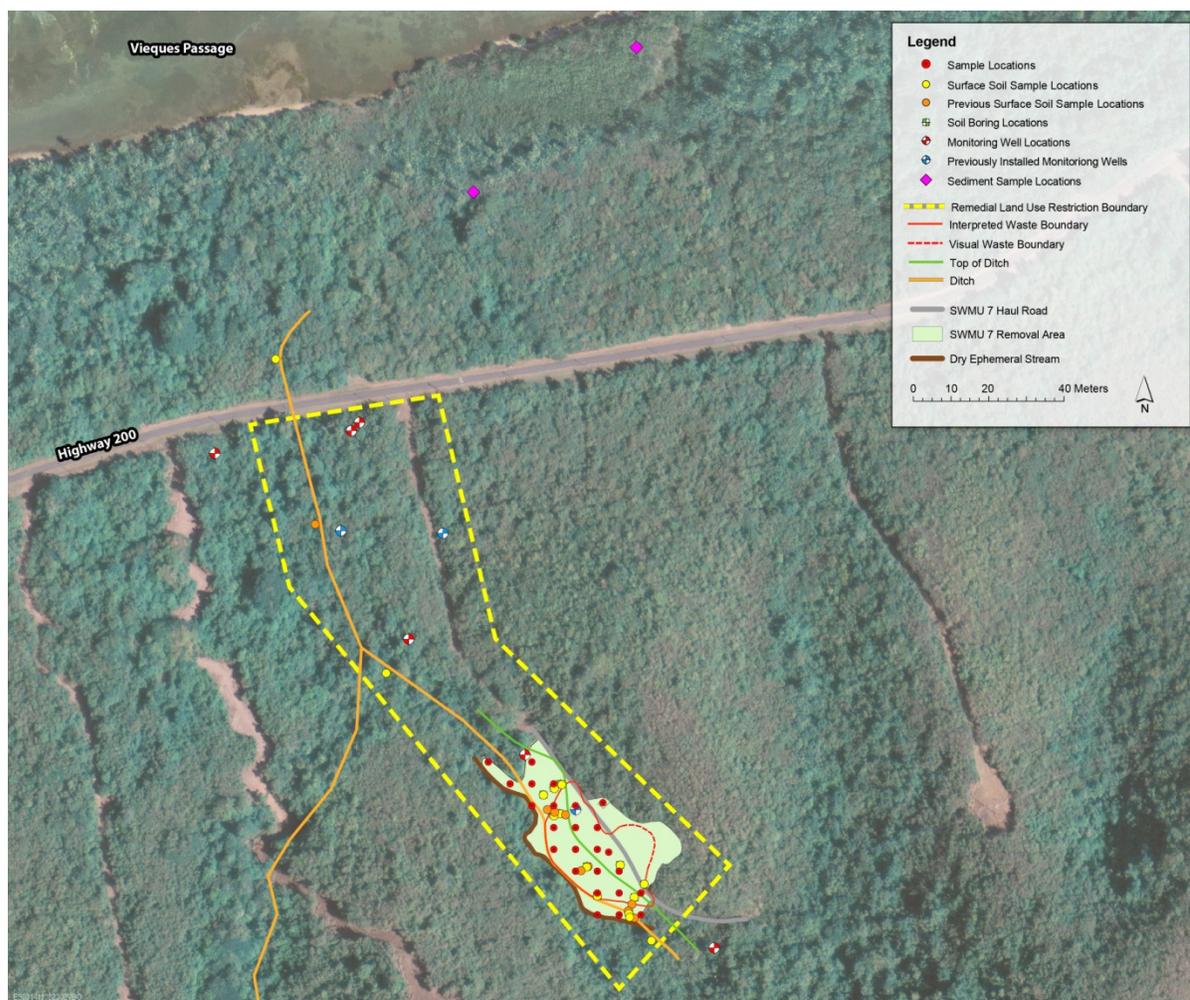
Previous Investigation// Removal Action*	Date	Investigation Activities
Pre-Removal Waste Characterization Human Health and Ecological Risk Assessment for SWMU 7	2008	A pre-removal HHRA and ERA were conducted to determine the areas of soil requiring excavation (together with the debris) as well as the appropriate disposal options for the soil. The soil dataset ⁵ for the HHRA and the soil dataset ⁵¹ for the ERA comprised surface and subsurface soil samples collected from within the debris areas during the PA/SI, the RI, and pre-removal waste characterization sampling. No potentially unacceptable human health risks ⁵² were identified for any receptors exposed to site soil. Potentially unacceptable ecological risks ⁵³ were identified for receptors exposed to copper, manganese, and zinc in soil within portions of the debris areas.
Determination of the Disposition of Excavated Soils at SWMU 7 Technical Memorandum	2008	Results of the pre-removal HHRA and ERA were used to determine areas of soil requiring removal (for unrestricted use), as well as the appropriate soil disposal options for SWMU 7. Four disposition options ⁵⁴ were considered, based on conclusions of the pre-removal HHRA and ERA. Option 4, a combination of the other three options, was selected. A soil disposition map ⁵⁵ identified the disposal determination by location (i.e., to remain onsite, use as daily cover at the Vieques Municipal Landfill) for site soils to be excavated with the debris.
Final Completion Report	2010	Between February and September 2009, approximately 5,366 tons of soil and debris were removed. Following completion of the removal action, confirmation soil samples were collected and used to complete a post-removal HHRA and ERA.
Post-Removal Action Risk Assessment Report Area of Concern (AOC) J and Solid Waste Management Unit (SWMU) 7	2011	Analytical results from confirmation soil sampling activities conducted following the removal action were used to complete a post-removal HHRA and ERA. The results of the post-removal risk assessments indicate the current site conditions are protective of human health and the environment for unrestricted use and exposure. Following the removal action, a site visit with members of the RAB and general public was conducted to present the post-removal site conditions.
Proposed Plan	2011	The Preferred Alternative for SWMU 7 was presented in the Proposed Plan (PP). The public was invited to review the PP and provide comments prior to making the final decision.

* Documentation associated with the listed activities is available in the Administrative Record and provides detailed information used to support the no further action determination for SWMU 7. The relevant referenced information is also accessible by the hyperlinks in this document.

2.3.4 Distribution of Contamination

Evaluation of the nature and extent of contamination in environmental media and the assessment of human health and ecological risks for SWMU 7 were conducted in 2000 as part of the Expanded PA/SI, in 2007 as part of the RI, and in 2011 as part of the Post-Removal Action Risk Assessment following the removal action. The nature and extent of contamination at SWMU 7 is based on the analysis of groundwater data collected during the Expanded PA/SI and RI, and soil data collected during the removal action confirmatory sampling (Figure 9). Chemical concentrations were compared to risk based screening values for human health and ecological receptors. Constituents detected above screening criteria and background concentrations (for inorganics) are summarized in Table 8.

FIGURE 9
SWMU 7 Sample Locations



No VOCs, pesticides, or explosives exceeded screening criteria in soil or groundwater. Four SVOCs (benzo[a]pyrene, benzo[a]anthracene, benzo[b]fluoranthene, and dibenzo[a,h]anthracene) exceeded screening criteria only in soil. The explosive perchlorate was detected above a risk-based screening criterion in one groundwater sample. However, the initial analytical detection method was prone to false positive detections. Perchlorate was not detected during the subsequent sampling event. Seven inorganic constituents (aluminum, arsenic, chromium, cobalt, iron, manganese, and vanadium) in soil and six inorganic constituents (aluminum, antimony, arsenic, manganese, vanadium, and zinc) in groundwater exceeded background concentrations and screening criteria. Inorganic constituent concentrations in soil were generally only slightly above background levels and, therefore, likely associated with background. Inorganic constituent concentrations in groundwater are the result of high turbidity and suspended solid during sampling and/or slightly exceeded background levels and are attributable to background. Only total arsenic concentrations exceeded the MCL and PRWQS at two monitoring wells; however, dissolved concentrations were below the standards or not detected. Therefore, the total arsenic concentrations are associated with turbidity induced by sampling and are not likely representative of normal groundwater conditions.

TABLE 8
Soil and Groundwater Exceedances for SWMU 7

Environmental Media	COPC	Maximum Concentration Detected Above Screening Criteria and Background	Screening Criteria			
			West Vieques Background Value (KTd)	May 2010 RSL for Residential Soil	May 2010 RSL for Industrial Soil	Ecological Criteria
Soil	Semivolatile Organic Compounds (mg/kg)					
	Benzo(a)anthracene	0.164J	--	0.15	2.1	--
	Benzo(a)pyrene	0.102	--	0.015	0.21	--
	Benzo(b)fluoranthene	0.319	--	0.15	2.1	--
	Dibenz(a,h)anthracene	0.0174J	--	0.015	0.21	--
	Total Inorganics (mg/kg)					
	Aluminum	33,900	18,000	7,700	99,000	--
	Arsenic	3.6	1.2	0.39	1.6	18
	Chromium	93.3J	52	0.29	5.6	64
	Cobalt	29.3J	13	2.3	30	13
	Iron	53,700	28,000	5,500	72,000	--
	Manganese	1,690	1,200	180	2,300	220
Vanadium	174	80	39	520	130	
Environmental Media	COPC	Maximum Concentration Detected Above Screening Criteria and Background	Screening Criteria			
			NDW07MW08 Background	2002 PRG for Tap Water, Adjusted	Maximum Contaminant Level	2010 Puerto Rico Water Quality Standards, Class SG
Groundwater	Dissolved Inorganics (µg/L)					
	Aluminum	53.1	61.3	365	--	--
	Arsenic	8.4	2.04UJ	0.045	10	10
	Manganese	1,670	21.7	87.6	--	--
	Lead	1.7	1.76UJ	15	15	15
	Vanadium	59.8	8.67	25.5	--	--
	Zinc	20.7	0.492	1,090	--	--
	Total Inorganics (µg/L)					
	Aluminum	4,090	102	3,650	--	--
	Antimony	1.5	2.5U	1.46	6	5.6
	Arsenic	37.1	2.04UJ	0.0448	10	10
	Chromium	29.4	13.6	11	100	100
	Manganese	1,740	23.4	87.6	--	--
	Lead	25.1	1.76UJ	15	15	15
	Vanadium	58	8.64	25.5	--	--
	Zinc	2,950	2.67	1,090	--	--
	Organic Compounds (µg/L)					
Perchlorate	2.4	--	0.365	--	--	

2.3.5 Current and Potential Future Land and Resource Uses

The former NASD occupied approximately 8,000 acres, most of which is undeveloped. Military operations ceased on the former NASD in April 2001 and the land containing SWMU 7 was transferred to the MOV. The site is overgrown and not readily accessible and public access to the site is currently restricted. There has been no evidence of public access to the site. Groundwater beneath SWMU 7 is classified by the Commonwealth of Puerto Rico as SG, where groundwater may be intended for use as a source of drinking water supply, agricultural use, and/or flows into waters that support ecological communities of exceptional ecological value. However, groundwater is not used as a potable water source at or in the vicinity of SWMU 7, and there are no plans for future potable use of groundwater in this area. No archeological sites or districts are located at SWMU 7.

2.3.6 Summary of Site Risks

The potential for contaminant migration from wind erosion, surface runoff, and groundwater is minimal. The potential future sources of contamination (debris) and soils potentially posing unacceptable risk were removed from the site and the vegetative cover reduces the potential for migration. A CSM of SWMU 7 is provided as Figure 10. Potential human health and ecological risks were quantitatively evaluated based on the receptor scenarios and potentially impacted media identified in the CSM.

Human Health Risk Assessment

Based on the CSM, human health risks were quantitatively evaluated for **potential human receptors**⁵⁶ exposed to surface soil, total soil (surface and subsurface), and groundwater using RME assumptions. The RME assumes the highest level of human exposure that could reasonably be expected to occur. The potential non-cancer hazards, expressed as the HI, and cancer risk estimates were calculated using RME exposure assumptions. For non-cancer effects, an HI represents the ratio between the reference dose and the RME dose for a person in contact with site COPCs. An HI exceeding 1 indicates that adverse health effects may occur. For known or suspected carcinogens, acceptable exposure levels generally are concentration levels that represent an excess upper bound lifetime cancer risk to an individual between 10^{-4} (a 1 in 10,000 chance of developing cancer from site exposures) and 10^{-6} (a 1 in 1,000,000 chance of developing cancer from site exposures) using information on the relationship between dose and response.

Groundwater data collected during the RI and previous investigations, and soil data collected during the post-excavation confirmation sampling data, were used to quantitatively evaluate potential human health risks based on exposure to existing site media. All potential exposure pathways, media, and receptor scenarios evaluated in the HHRA result in a conclusion that there are **no unacceptable human health risks**⁵⁷ attributed to CERCLA-related releases from historic Navy activities at SWMU 7 (Table 9). Although potentially unacceptable cancer risks and non-cancer hazards were identified for ingestion of groundwater by future residents (adult and child) and future industrial workers as a result of the presence of perchlorate, arsenic, iron, and vanadium, the potential risks/hazards associated with these constituents are attributable to background or from false detections, and not historic Navy activities at SWMU 7. As noted previously, perchlorate was likely a false detection based on the initial analytical method used, which was not used during the subsequent sampling event. Inorganic constituent concentrations in soil are attributable to background and inorganic constituent concentrations in groundwater are attributable to background and/or are the result of high turbidity and suspended solids during sampling, and not from a CERCLA-related release.

FIGURE 10
SWMU 7 Conceptual Site Model

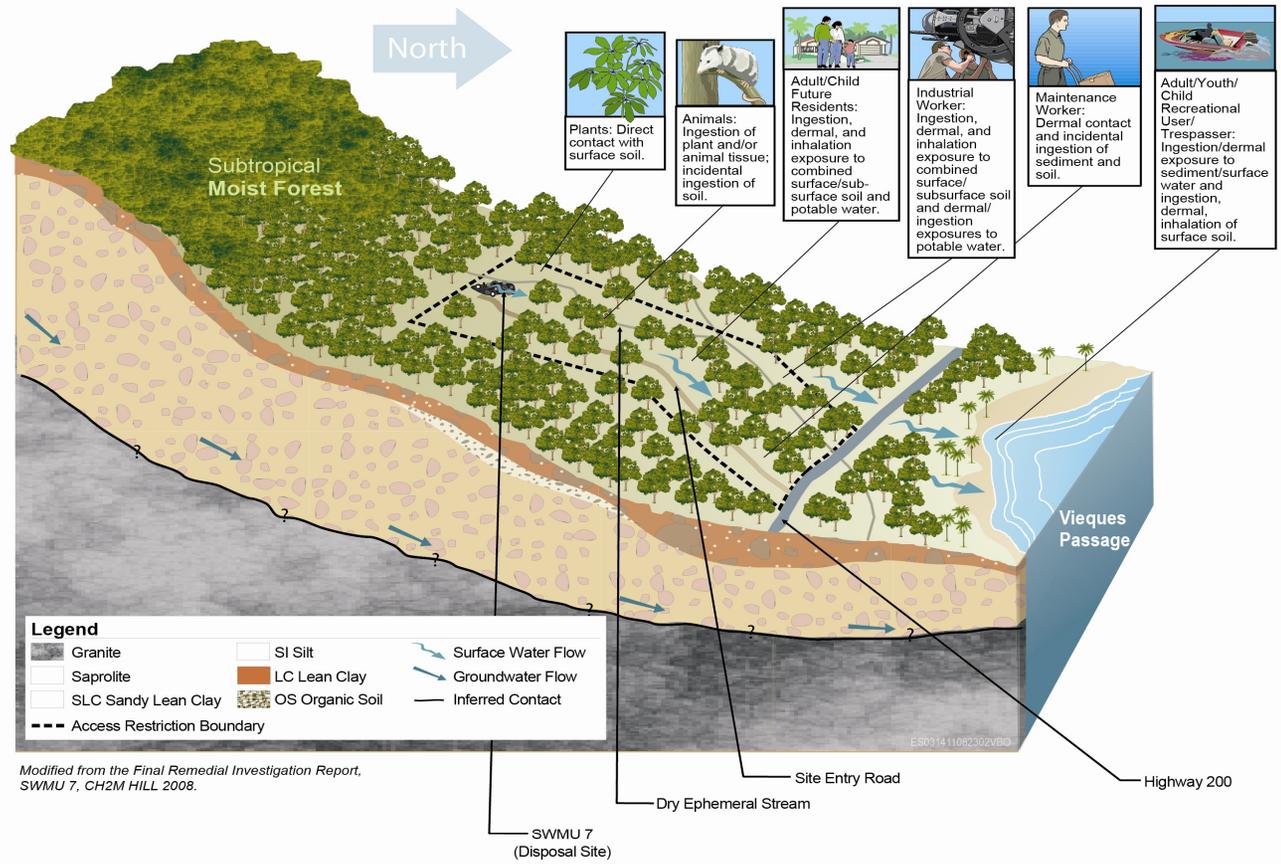


TABLE 9
Summary of Receptors With Risk and Hazard Estimates Above Regulatory Levels at SWMU 7

Receptor	Media	Pathway	Constituent of Concern	Exposure Point Concentration	RME Cancer Risk	Cancer Slope Factor (mg/kg-day ⁻¹)	RME Non Cancer Hazard	Non-Cancer Toxicity Factor - Reference Dose (mg/kg-day)
Future Adult Resident	Groundwater	Ingestion	Perchlorate	2.4	-	-	2	0.00003
			Arsenic	37	5x10 ⁻⁴	1.5	3	0.0003
			Vanadium	44	-	-	1	0.001
Future Child Resident	Groundwater	Ingestion	Perchlorate	2.4	-	-	5	0.00003
			Arsenic	37	3x10 ⁻⁴	1.5	8	0.0003
			Iron	7,300	-	-	2	0.3
			Vanadium	44	-	-	3	0.001
Future Industrial Worker	Groundwater	Ingestion	Arsenic	37	2x10 ⁻⁴	1.5	1	0.0003

Ecological Risk Assessment

An ERA was conducted for SWMU 7, consisting of Steps 1 through 3A, in accordance with Navy and EPA policy and guidance. In Step 1 (Problem Formulation), the goals, scope, and focus of the ERA were identified that included descriptions of the environmental setting (i.e., habitats, vegetation, wildlife, protected species), types and concentrations of chemicals in surface soil, and potentially complete exposure pathways. This information was used to develop the **ecological CSM**⁵⁸ and **ecological assessment and measurement endpoints**⁵⁹. Potentially complete pathways were identified for lower trophic level receptors (plants and soil invertebrates) and upper-trophic level receptors (birds and mammals) exposed to surface soil. There are no permanent aquatic or wetland habitats at SWMU 7, since the ephemeral stream only flows during rainstorms.

In Step 2, HQs were calculated to characterize the potential for constituents to pose unacceptable ecological risk using conservative exposure assumptions. HQs represent a ratio of the exposure level to an ecological effect level, and are an estimate of potential risk. Maximum soil constituent concentrations were used in Step 2 to estimate potential exposures to upper and lower trophic level ecological receptors selected to represent the assessment endpoints at SWMU 7. Upper trophic level effects were determined using a food web model that estimated the concentration of each **bioaccumulating chemical**⁶⁰ in each relevant dietary component, and comparing the total dietary intake of the chemical to wildlife **TRVs**⁶¹. TRVs were based on chronic NOAELs and chronic LOAELs obtained from scientific literature. For lower trophic level receptors, the exposure concentrations for soil were screened against **eco-SSLs**⁶² developed by EPA or alternate regulatory-approved screening values as provided in the **Master Ecological Risk Assessment Protocol for Vieques**⁶⁴ if eco-SSLs were not available. Chemicals with HQs greater than 1 were identified as **ecological COPCs**⁶⁵ for further evaluation in Step 3 of the ERA.

In **Step 3A**⁶⁶, the conservative exposure assumptions employed for Step 2 were refined and risk estimates were recalculated using more realistic assumptions including mean media concentrations, bioaccumulation factors, and exposure parameters. Other considered factors included comparison to background concentrations, other accepted ecological screening values in the scientific literature, frequency of detection, frequency and magnitude of screening value exceedances, and limited spatial distribution of the COPCs.

The Step 3A refinement resulted in no COCs being identified for either upper or lower trophic level receptors. However, because of the uncertainty associated with the debris being a potential future source of contamination, a removal action and confirmatory sampling were conducted to re-assess potential ecological risks from soil exposure. Considering the analytical results of post-removal confirmatory sampling, the ERA resulted in no COCs identified at SWMU 7. Thus, risks to ecological receptors are acceptable at SWMU 7, and no further evaluation or remediation is warranted with respect to ecological receptors.

2.4 No Further Action Determination

Based on results of the RI HHRA and ERA, there are no unacceptable risks to human health or the environment over that of background for unrestricted use of and exposure to site media at AOCs J and R and SWMU 7. The Navy, in partnership with the EPA, with concurrence by PREQB, determined no further action is warranted. The past removal action eliminated the source of potential future releases and contaminant levels in soil that may have posed unacceptable risks to human health and the environment. The NFA determination meets the statutory requirements of CERCLA and the regulatory requirements of the NCP for protection of human health and the environment. No further remedial response action and no restrictions on land use or exposure are necessary at AOCs J and R and SWMU 7.

2.5 Community Participation

The Navy, in partnership with the EPA and PREQB, established a community relations program for the Vieques environmental restoration program in 2001. The program promotes communication regarding site investigations and remediation activities between the stakeholder agencies (Navy, EPA, PREQB, and the MOV) and the public. The community relations program formed a RAB in 2004 to encourage community involvement. RAB meetings are held approximately every 3 months and are open to the public for participation.

In accordance with Section 117(a) of CERCLA, the Navy provided a public comment period between June 20, 2011 and August 3, 2011, for the AOCs J and R and SWMU 7 Proposed Plan. A public meeting to present the Proposed Plan was held on July 7, 2011 at Jorge's Ice House in Barrio Martineau, Vieques, Puerto Rico. The meeting provided an additional opportunity for the public to submit comments on the Proposed Plan.

The Proposed Plan and previous investigation reports for AOCs J and R and SWMU 7 were available during the public comment period and are currently available in the NASD Administrative Record. The Administrative Record is accessible to the public via:

Biblioteca Electrónica
Benítez Guzmán Street, Corner with Baldorioty de Castro Street
Isabel Segunda

Vieques, PR 00765
Phone: (787) 741-2114

Hours of Operation:
Monday – Friday, 8:00 a.m. – 4:00 p.m.

Or online at:

<http://public.lantops-ir.org/sites/public/vieques/default.aspx>

3 Responsiveness Summary

The Responsiveness Summary is a concise summary of substantive comments received from the public during the public comment period and the associated responses. The Responsiveness Summary was prepared in accordance with guidance in *Community Relations in Superfund: A Handbook* (EPA, 1992) after the public comment period ended.

3.1 Overview

The Proposed Plan presented to the public identified that no further action is necessary for environmental media at AOC J, AOC R, and SWMU 7 in order to protect human health and the environment.

3.2 Community Involvement Process

The public comment period for the proposed no further action determination for AOC J, AOC R, and SWMU 7 began on June 20, 2011, and ended on August 3, 2011. A public meeting was held on July 7, 2011, at Jorge's Ice House, located at Carr. 200, Km 3, hm 2, in Vieques, Puerto Rico, to present information pertinent to the proposed no further action determination and to accept comments and questions regarding this determination. The public meeting transcript is attached as Appendix A.

3.3 Summary of Comments Received During Public Comment Period and Navy/EPA Responses

No community members expressed opposition to the proposed no further action determination for AOC J, AOC R, and SWMU 7. No questions were received by the Navy, EPA, or PREQB during the public comment period. However, one verbal comment was submitted during the public meeting (Appendix A) and one written comment was submitted to PREQB during the public comment period. A copy of this letter is presented in Appendix B. The main point(s) raised by the comments are paraphrased below along with the Navy's and EPA's responses.

Verbal Comment Submitted during July 7, 2011, Public Meeting

The determinations for these sites are based on data that represent current conditions. Without data collected from the beginning of the Navy's use of the land, it is unknown what historical contaminant levels and associated risks may have been.

Response

While it is true that the data collected represent current conditions, the CERCLA process is designed to evaluate how historical use and activity at a site may have impacted the land and the associated risks posed by any impact. The process is implemented once the historical activities have ceased and, therefore, likely best represent the cumulative impact of the years of site use (and potential contaminant release).

The three sites included in this record of decision were used for historical waste disposal, which took place over multiple years at all three sites. Although it is not possible to measure past contaminant levels, it is important to note that the CERCLA site characterization process is designed to ensure that not only the potential sources of contamination (i.e., debris areas for AOC J, AOC R, and SWMU 7) are sufficiently characterized, but also the

potential contaminant transport pathways, such as the underlying soil and groundwater and adjacent ephemeral streams. Evaluating these potential contaminant transport pathways, together with an understanding of how particular contaminants behave in the environment, provides insight into historical site conditions, contaminant releases, and contaminant levels.

Written Comment Submitted during Public Comment Period

The Navy should not transfer the lands containing AOC J, AOC R, and SWMU 7 until the CERCLA process has been completed for all west Vieques sites because it is unknown what issues may arise during cleanup of the remaining sites. Additionally, the lands containing the three sites should remain the property of the Fish and Wildlife Service and be designated as ecological zones.

Response

The Navy does not own the land containing AOC J, AOC R, and SWMU 7. In accordance with the Memorandum of Agreement (MOA) between the Navy and the Department of Interior, dated January 27, 2001, the land containing AOC J was transferred to the administrative jurisdiction of the Department of Interior in 2001, pursuant to Section 1508 of Title XV of Public Law 106-398. Similarly, in accordance with the Quitclaim Deed between the Navy and the Municipality of Vieques (MOV), dated April 30, 2001, the land containing AOC R and SWMU 7 was transferred to the MOV in 2001, pursuant to the same law. For each of the three sites, the MOA and Quitclaim Deed (as applicable) restricted use and access to the land until, among other options, the Navy completed remedial action that allowed for unrestricted or planned site use. Because the Navy has now met this condition for all three sites, specific future land use and access are at the discretion of the Fish and Wildlife Service (for AOC J) and the MOV (for AOC R and SWMU 7). However, it should be noted that in accordance with the MOA, the lands transferred to the Department of Interior shall be administered generally as a wildlife refuge under the National Wildlife Refuge Administration Act of 1966.



Acronyms

amsl	above mean sea level
AOC	area of concern
AST	aboveground storage tank
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
COC	constituent of concern
COPC	constituent of potential concern
CSM	conceptual site model
DDT	dichlorodiphenyltrichloroethane
DOI	Department of the Interior
DRO	diesel range organics
EBS	Environmental Baseline Survey
eco-SSL	ecological soil screening level
EE/CA	Engineering Evaluation/Cost Analysis
EPA	United States Environmental Protection Agency
ERA	Ecological Risk Assessment
FFA	Federal Facilities Agreement
ft bgs	feet below ground surface
ft/ft	feet per foot
ft/year	feet per year
GRO	gasoline range organics
HHRA	Human Health Risk Assessment
HI	hazard index
HQ	hazard quotient
LOAEL	lowest observed adverse effect level
MCL	Maximum Contaminant Level
MEK	methyl ethyl ketone
msl	mean sea level
µg/L	micrograms per liter
mg/kg	milligrams per kilogram

MIBK	methyl isobutyl ketone
MOV	Municipality of Vieques
NASD	Naval Ammunition Support Detachment
NAVFAC	Naval Facilities Engineering Command
Navy	United States Department of the Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	no further action
NOAEL	no observed adverse effect level
NPL	National Priorities List
NRWQC	National Recommended Water Quality Criteria
ORO	oil range organics
PA/SI	Preliminary Assessment/Site Inspection
PCB	polychlorinated biphenyl
PP	Proposed Plan
PREQB	Puerto Rico Environmental Quality Board
PRWQS	Puerto Rico Water Quality Standard
RAB	Restoration Advisory Board
RI	Remedial Investigation
RME	reasonable maximum exposure
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SI	Site Inspection
SMP	Site Management Plan
SSL	soil screening level
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TCE	trichloroethene
TPH	total petroleum hydrocarbon
TRV	toxicity reference value
VOC	volatile organic compound



References

Item	Reference Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record
Ref. 1	subsurface soil samples	Table 1	Program Management Company. 2000. <i>Environmental Baseline Survey for NASD, Vieques Island</i> . October. Table 5-4.
Ref. 2	analytical results	Table 1	CH2M HILL. 2002. <i>Expanded Preliminary Assessment/Site Investigation, Phase II Seven Sites, Former U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . November. Tables 6-1 through 6-5.
Ref. 3	analytical results	Table 1	CH2M HILL. 2007. <i>Final Remedial Investigation Report, Area of Concern (AOC) J, Former Naval Ammunition Storage Detachment, Vieques, Puerto Rico</i> . May. Tables 4-5 through 4-12 and Figures 4-1 through 4-6.
Ref. 4	removal action alternatives	Table 1	CH2M HILL. 2005. <i>Engineering Evaluation/Cost Analysis For Area of Concern J and R, and Solid Waste Management Units 6 and 7, Former Naval Ammunitions Support Detachment, Vieques Island, Puerto Rico</i> . December 2005. Section 3 Pages 3-1 to 3-2.
Ref. 5	debris areas	Table 1	CH2M HILL, 2005. <i>Engineering Evaluation/Cost Analysis For Area of Concern J and R, and Solid Waste Management Units 6 and 7, Former Naval Ammunitions Support Detachment, Vieques Island, Puerto Rico</i> . December 2005. Figure 3-1.
Ref. 6	soil dataset	Table 1	CH2M HILL. 2008. <i>Pre-Removal Waste Characterization Human Health Risk Assessment for AOC J, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . October. Section 2-1 and Figure 1.
Ref. 7	soil dataset	Table 1	CH2M HILL. 2008. <i>Pre-Removal Waste Characterization Ecological Risk Assessment for AOCs J and R, SWMUs 6 and 7, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . October. Section 2.1, Table 2-1, and Figure 2-1.
Ref. 8	no potentially unacceptable human health risks	Table 1	CH2M HILL. 2008. <i>Pre-Removal Waste Characterization Human Health Risk Assessment for AOC J, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . October. Section 5.3 and Tables 9.1.RME through 9.4.RME.

Item	Reference Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record
Ref. 9	potentially unacceptable ecological risks	Table 1	CH2M HILL. 2008. <i>Pre-Removal Waste Characterization Ecological Risk Assessment for AOCs J and R, SWMUs 6 and 7, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . October. Section 5.1 and Table 5-4.
Ref. 10	disposition options	Table 1	CH2M HILL. 2008. <i>Draft Technical Memorandum, Determination of the Disposition of Excavated Soils at AOC J, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico</i> . December. Page 1.
Ref. 11	soil disposition map	Table 1	CH2M HILL. 2008. <i>Draft Technical Memorandum, Determination of the Disposition of Excavated Soils at AOC J, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico</i> . December. Figure 1.
Ref. 12	potential human receptors	Section 2.1.6	CH2M HILL. 2007. <i>Final Remedial Investigation Report, Area of Concern (AOC) J, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . May. Figure 5-1.
Ref. 13	no unacceptable human health risks	Section 2.1.6	CH2M HILL. 2007. <i>Final Remedial Investigation Report, Area of Concern (AOC) J, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . May. Section 6.1.3. CH2M HILL, 2011. <i>Post-Removal-Action Risk Assessment Report Area of Concern (AOC) J and Solid Waste Management Unit (SWMU) 7, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . February. Section 3.5.
Ref. 14	ecological CSM	Section 2.1.6	CH2M HILL. 2007. <i>Final Remedial Investigation Report, Area of Concern (AOC) J, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . May. Figure 5-1.
Ref. 15	ecological assessment and measurement endpoints	Section 2.1.6	CH2M HILL. 2007. <i>Final Remedial Investigation Report, Area of Concern (AOC) J, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . May. Appendix L, Table L-18.
Ref. 16	bioaccumulating chemical	Section 2.1.6	CH2M HILL, 2011. <i>Post-Removal-Action Risk Assessment Report Area of Concern (AOC) J and Solid Waste Management Unit (SWMU) 7, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . February. Table B-6.
Ref. 17	toxicity reference values	Section 2.1.6	CH2M HILL, 2011. <i>Post-Removal-Action Risk Assessment Report Area of Concern (AOC) J and Solid Waste Management Unit (SWMU) 7, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . February. Table B-16 and B-17.
Ref. 18	ecological soil screening levels	Section 2.1.6	CH2M HILL, 2011. <i>Post-Removal-Action Risk Assessment Report Area of Concern (AOC) J and Solid Waste Management Unit (SWMU) 7, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . February. Table B-15.

Item	Reference Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record
Ref. 19	Master Ecological Risk Assessment Protocol for Vieques	Section 2.1.6	CH2M HILL, 2010. <i>Master Standard Operating Procedures, Protocols, and Plans. Environmental Restoration Program. Vieques, Puerto Rico.</i> Final. April. Table 18. CH2M HILL. 2010. <i>Master Ecological Risk Assessment Protocol for Vieques Environmental Restoration Program – Update 1 (Addendum).</i> Draft. August. Table 18.
Ref. 20	Master Ecological Risk Assessment Protocol for Vieques	Section 2.1.6	CH2M HILL, 2010. <i>Master Standard Operating Procedures, Protocols, and Plans. Environmental Restoration Program. Vieques, Puerto Rico.</i> Final. April. Table 15.
Ref. 21	ecological COPCs	Section 2.1.6	CH2M HILL, 2011. <i>Post-Removal-Action Risk Assessment Report Area of Concern (AOC) J and Solid Waste Management Unit (SWMU) 7, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico.</i> February. Table B-20.
Ref. 22	Step 3A	Section 2.1.6	CH2M HILL, 2011. <i>Post-Removal-Action Risk Assessment Report Area of Concern (AOC) J and Solid Waste Management Unit (SWMU) 7, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico.</i> February. Section B.5.3.1, Table B-19
Ref. 23	habitat for wildlife	Section 2.2.2	CH2M HILL. 2011. <i>Final Remedial Investigation Report, Area of Concern R, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico.</i> December. Section 3.2
Ref. 24	analytical results	Table 3	CH2M HILL. 2002. <i>Expanded Preliminary Assessment/ Site Investigation, Phase II Seven Sites, Former U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico.</i> November. Figure 9-2 and Table 9-1
Ref. 25	debris areas	Table 3	CH2M HILL. 2005. <i>Engineering Evaluation/Cost Analysis For Area of Concern J and R, and Solid Waste Management Units 6 and 7, Former Naval Ammunitions Support Detachment, Vieques Island, Puerto Rico.</i> December 2005. Figure 1-4.
Ref. 26	removal action alternatives	Table 3	CH2M HILL. 2005. <i>Engineering Evaluation/Cost Analysis For Area of Concern J and R, and Solid Waste Management Units 6 and 7, Former Naval Ammunitions Support Detachment, Vieques Island, Puerto Rico.</i> December 2005. Section 3, Table 3-1 and Table 3-2.
Ref. 27	soil dataset	Table 3	CH2M HILL. 2008. <i>Pre-Removal Waste Characterization Human Health Risk Assessment for AOC R, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico.</i> October. Section 2.1 and Figure 1.
Ref. 28	soil dataset	Table 3	CH2M HILL. 2008. <i>Pre-Removal Waste Characterization Ecological Risk Assessment for AOCs J and R, SWMUs 6 and 7, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico.</i> October. Section 2.1, Table 2-1, and Figure 2-2.

Item	Reference Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record
Ref. 29	Potentially unacceptable human health risks	Table 3	CH2M HILL. 2008. <i>Pre-Removal Waste Characterization Human Health Risk Assessment for AOC R, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . October. Section 5.4 and Attachment 1; Tables 7.1 through 7.4
Ref. 30	Potentially unacceptable ecological risks	Table 3	CH2M HILL. 2008. <i>Pre-Removal Waste Characterization Ecological Risk Assessment for AOCs J and R, SWMUs 6 and 7, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . October. Section 5.2 and Tables 5-4 and 5-5.
Ref. 31	disposition options	Table 3	CH2M HILL. 2008. <i>Draft Technical Memorandum, Determination of the Disposition of Excavated Soils at AOC R, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico</i> . December. Page 1.
Ref. 32	soil disposition map	Table 3	CH2M HILL. 2008. <i>Draft Technical Memorandum, Determination of the Disposition of Excavated Soils at AOC R, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico</i> . December. Figure 1.
Ref. 33	results	Table 3	CH2M HILL. 2011. <i>Final Remedial Investigation Report, Area of Concern R, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . December. Tables 4-1 through 4-6 and Figures 4-1 through 4-19.
Ref. 34	potential human receptors	Section 2.2.6	CH2M HILL. 2011. <i>Final Remedial Investigation Report, Area of Concern R, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . December. Figure 6-1
Ref. 35	no unacceptable human health risks	Section 2.2.6	CH2M HILL. 2011. <i>Final Remedial Investigation Report, Area of Concern R, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . December. Section 8.2.5
Ref. 36	ecological CSM	Section 2.2.6	CH2M HILL. 2011. <i>Final Remedial Investigation Report, Area of Concern R, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . December. Figure 7-1
Ref. 37	ecological assessment and measurement endpoints	Section 2.2.6	CH2M HILL. 2011. <i>Final Remedial Investigation Report, Area of Concern R, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . December. Appendix R, Table R-5
Ref. 38	bioaccumulating chemical	Section 2.2.6	CH2M HILL. 2011. <i>Final Remedial Investigation Report, Area of Concern R, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . December. Appendix R, Table R-6
Ref. 39	Toxicity reference values	Section 2.2.6	CH2M HILL. 2011. <i>Final Remedial Investigation Report, Area of Concern R, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . December. Appendix R, Tables R-18 and R-19

Item	Reference Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record
Ref. 40	ecological soil screening levels	Section 2.2.6	CH2M HILL. 2011. <i>Final Remedial Investigation Report, Area of Concern R, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . December. Appendix R, Table R-13
Ref. 41	Master Ecological Risk Assessment Protocol for Vieques	Section 2.2.6	CH2M HILL, 2010. <i>Master Standard Operating Procedures, Protocols, and Plans. Environmental Restoration Program. Vieques, Puerto Rico</i> . Final. April. Table 18. CH2M HILL. 2010. <i>Master Ecological Risk Assessment Protocol for Vieques Environmental Restoration Program – Update 1 (Addendum)</i> . Draft. August. Table 18.
Ref. 42	Master Ecological Risk Assessment Protocol for Vieques	Section 2.2.6	CH2M HILL, 2010. <i>Master Standard Operating Procedures, Protocols, and Plans. Environmental Restoration Program. Vieques, Puerto Rico</i> . Final. April. Table 15.
Ref. 43	ecological COPCs	Section 2.2.6	CH2M HILL. 2011. <i>Final Remedial Investigation Report, Area of Concern R, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . December. Appendix R, Tables R-26 and R-27
Ref. 44	Step 3A	Section 2.2.6	CH2M HILL. 2011. <i>Final Remedial Investigation Report, Area of Concern R, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . December. Appendix R, Tables R-21, R-24, R-25, R-26, and R-27
Ref. 45	analytical results	Table 5	Environmental Science and Engineering, Inc. 1986. <i>Confirmation study to determine possible dispersion and migration of specific chemicals, U.S. Naval Station, Roosevelt Roads, Puerto Rico, and U.S. Naval Ammunition Facility, Vieques: Evaluation and data from first and second rounds of verification sample collection and analysis</i> . May. Table 2-1
Ref. 46	analytical results	Table 5	CH2M HILL. 2002. <i>Expanded Preliminary Assessment/ Site Investigation, Phase II Seven Sites, Former U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . November. Tables 6-1 through 6-3
Ref. 47	analytical results	Table 5	CH2M HILL, 2008. <i>Final Remedial Investigation Report Solid Waste Management Unit (SWMU) 7, Former U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . March. Tables 4-3 through 4-10 and Figures 4-1 through 4-8.
Ref. 48	removal action alternatives	Table 5	CH2M HILL, 2005. <i>Engineering Evaluation/Cost Analysis For Area of Concern J and R, and Solid Waste Management Units 6 and 7, Former Naval Ammunitions Support Detachment, Vieques Island, Puerto Rico</i> . December 2005. Section 3.
Ref. 49	debris areas	Table 5	CH2M HILL, 2005. <i>Engineering Evaluation/Cost Analysis For Area of Concern J and R, and Solid Waste Management Units 6 and 7, Former Naval Ammunitions Support Detachment, Vieques Island, Puerto Rico</i> . December 2005. Figure 1-6.

Item	Reference Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record
Ref. 50	soil data set	Table 5	CH2M HILL, 2008. <i>Pre-Removal Waste Characterization Human Health Risk Assessment for SWMU 7, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . October. Section 2.1 and Figure 1.
Ref. 51	soil data set	Table 5	CH2M HILL, 2008. <i>Pre-Removal Waste Characterization Ecological Risk Assessment for AOCs J and R, SWMUs 6 and 7, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . October. Section 2.1, Table 2-1, and Figure 2-4.
Ref. 52	no potentially unacceptable human health risks	Table 5	CH2M HILL, 2008. <i>Pre-Removal Waste Characterization Human Health Risk Assessment for SWMU 7, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . October. Section 2.1.
Ref. 53	potentially unacceptable ecological risks	Table 5	CH2M HILL, 2008. <i>Pre-Removal Waste Characterization Ecological Risk Assessment for AOCs J and R, SWMUs 6 and 7, U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . October. Section 5.4 and Tables 5-4 and 5-11.
Ref. 54	disposition options	Table 5	CH2M HILL, 2008. <i>Draft Technical Memorandum, Determination of the Disposition of Excavated Soils at SWMU 7, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico</i> . December. Page 1.
Ref. 55	soil disposition map	Table 5	CH2M HILL, 2008. <i>Draft Technical Memorandum, Determination of the Disposition of Excavated Soils at SWMU 7, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico</i> . December. Figure 1.
Ref. 56	potential human receptors	Section 2.3.6	CH2M HILL, 2008. <i>Final Remedial Investigation Report Solid Waste Management Unit (SWMU) 7, Former U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . March. Figure 5-1
Ref. 57	no unacceptable human health risks	Section 2.3.6	CH2M HILL, 2008. <i>Final Remedial Investigation Report Solid Waste Management Unit (SWMU) 7, Former U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . March. Section 6.1.4. CH2M HILL, 2011. <i>Post-Removal-Action Risk Assessment Report Area of Concern (AOC) J and Solid Waste Management Unit (SWMU) 7, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . February. Section 5.5.
Ref. 58	ecological CSM	Section 2.3.6	CH2M HILL, 2008. <i>Final Remedial Investigation Report Solid Waste Management Unit (SWMU) 7, Former U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico</i> . March. Figure 5-1
Ref. 59	ecological assessment and measurement endpoints	Section 2.3.6	CH2M HILL, 2008. <i>Final Remedial Investigation Report Solid Waste Management Unit (SWMU) 7, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . March. Table L-13.

Item	Reference Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record
Ref. 60	bioaccumulating chemical	Section 2.3.6	CH2M HILL, 2011. <i>Post-Removal-Action Risk Assessment Report Area of Concern (AOC) J and Solid Waste Management Unit (SWMU) 7, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . February. Table D-6.
Ref. 61	toxicity reference values	Section 2.3.6	CH2M HILL, 2011. <i>Post-Removal-Action Risk Assessment Report Area of Concern (AOC) J and Solid Waste Management Unit (SWMU) 7, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . February. Table D-16 and D-17.
Ref. 62	ecological soil screening levels	Section 2.3.6	CH2M HILL, 2011. <i>Post-Removal-Action Risk Assessment Report Area of Concern (AOC) J and Solid Waste Management Unit (SWMU) 7, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . February. Table D-15.
Ref. 63	Master Ecological Risk Assessment Protocol for Vieques	Section 2.3.6	CH2M HILL, 2010. <i>Master Standard Operating Procedures, Protocols, and Plans. Environmental Restoration Program. Vieques, Puerto Rico</i> . Final. April. Table 18. CH2M HILL. 2010. <i>Master Ecological Risk Assessment Protocol for Vieques Environmental Restoration Program – Update 1 (Addendum)</i> . Draft. August. Table 18.
Ref. 64	Master Ecological Risk Assessment Protocol for Vieques	Section 2.3.6	CH2M HILL, 2010. <i>Master Standard Operating Procedures, Protocols, and Plans. Environmental Restoration Program. Vieques, Puerto Rico</i> . Final. April. Table 15.
Ref. 65	ecological COPCs	Section 2.3.6	CH2M HILL, 2011. <i>Post-Removal-Action Risk Assessment Report Area of Concern (AOC) J and Solid Waste Management Unit (SWMU) 7, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . February. Table D-20.
Ref. 66	Step 3A	Section 2.3.6	CH2M HILL, 2011. <i>Post-Removal-Action Risk Assessment Report Area of Concern (AOC) J and Solid Waste Management Unit (SWMU) 7, Former Naval Ammunition Storage Detachment, Vieques Island, Puerto Rico</i> . February. Section D.5.3.1, Table D-19

Detailed site information reference in this ROD in bold blue text is contained in the Administrative Record.

For access to information contained in the Administrative Record for NASD Vieques, please contact:

Public Affairs Office, NAVFAC Atlantic
6506 Hampton Blvd
Norfolk, Virginia 23508-1278
Phone: (757) 322-8005

Department of the Navy
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

**PUBLIC MEETING CONCERNING
AREA OF CONCERN J, R,
AND SOLID WASTE MANAGEMENT UNIT 7**

Date: July 7, 2011
Place: La Hielera de Jorge
Carretera 200 km. 3.2
Barrio Martineau
Vieques, Puerto Rico
Moderator: Susan Struve

PROCEEDINGS

Mr. GARCIA MARTINEZ: Julián García Martínez, Vieques resident and employee of the Puerto Rico Conservation Commission and current manager of the west part for said organization.

My major concern is...the safety that is said that we currently have means that there is no risk of contamination and that we forget the details of the past. This is the point from which war time activities started in Vieques

He explained: It is very difficult to determine data like this if I do not have technical evaluation, chemical analysis from the onset, in so much that this can provide a percent toxicity variable. And it is not the same to say that today, for example, in 2009 or 2011 the levels of toxins are low. But then, at a beginning? What were the concentrations? What levels did they have? And what was the population that was there at that time that used those bodies of water or those lands?

I understand that it is difficult to determine what the risk was from the onset of the Navy's war activities until present. Just the same...there is a time variable from which there was a concentration. If I do not have technical evidence of what the concentrations were, of what the percentages were in the bodies of water, of the chemicals or contaminants transported, for example, by air. In terms of these, it is very difficult to determine how much damage could have occurred not at the present. In other words, in the past not at the present, until today. This is my concern. .

(This concludes the proceedings)

DEPARTAMENTO DE LA MARINA
AGENCIA DE PROTECCION AMBIENTAL DE LOS ESTADOS UNIDOS
SERVICIO DE PESCA Y VIDA SILVESTRE DE LOS ESTADOS UNIDOS

**VISTA PUBLICA SOBRE
AREAS DE PREOCUPACION J, R
Y UNIDAD DE MANEJO DE DESPERDICIOS SOLIDOS 7**

Fecha: 7 de julio de 2011

Lugar: La Hielera de Jorge
Carretera 200 km. 3.2
Barrio Martineau
Vieques, Puerto Rico

Moderadora: Susan Struve

PROCEDIMIENTOS

SR. GARCIA MARTINEZ: Julián García Martínez, residente de Vieques, empleado del Fideicomiso de Conservación de Puerto Rico y actualmente, pues, manejo la propiedad del oeste de dicha organización.

Mi preocupación mayormente está en cómo... si realmente la seguridad con que se dice que, al presente, no hay riesgo de contaminante, pero olvidamos unos detalles sobre el pasado. Esto es desde que comenzaron las actividades bélicas en Vieques.

Me explico: es bien difícil determinar un dato como éste si yo no tengo en mis manos evidencia de evaluación técnica, análisis químico desde ese comienzo, en términos de que esto puede ser una variable en por ciento de toxicidad. Y no es lo mismo decir que, hoy día, en el))por ejemplo)) 2009, 2011, que los niveles son bajos en tóxicos. Pero entonces, ¿en un comienzo? ¿Cómo eran esas concentraciones? ¿Qué niveles tenían? ¿Y la población que estaba entonces, en ese tiempo, que utilizaba esos cuerpos de agua subterráneos, que utilizaba esos terrenos?

Entiendo que es difícil determinar cuán riesgoso fue desde el comienzo de las actividades bélicas de la Marina hasta el presente. Como que esto... Hay una variable de tiempo en términos de cuál fue la concentración. Si yo no tengo una evidencia técnica de cuáles eran esas concentraciones, de

cuáles fueron esos porcentos de esos cuerpos de agua, de la... los químicos o los contaminantes que fueron transportados, por ejemplo, por el aire. En términos de eso, es bien difícil determinar cuán dañino pudo haber sido, no al presente. O sea, no al presente, sino en el pasado, hasta el día de hoy.

Esa es mi preocupación.

(Se da por concluidos los procedimientos.)

CERTIFICADO DEL TAQUIGRAFO

Yo, Luis García, E.R. Reporter, miembro de FASYO Reporters, CERTIFICO:

Que la que antecede constituye la transcripción fiel y exacta de la grabación realizada durante la vista pública celebrada en el sitio y la fecha que se indican en la página uno de esta transcripción.

Certifico además que no tengo interés en el resultado de este asunto y que no tengo parentesco en ningún grado de consanguinidad con las partes involucradas en el mismo.

En San Juan de Puerto Rico, a 15 de julio de 2011.

LUIS GARCIA

E.R. Reporter

July 8, 2011

Wilmarie Rivera
Federal Facilities Coordinator
Environmental Quality Board

Regards,

I am writing to you in reference to the public comments on the Proposed Plan for Areas AOC J, R and SWMU 7. I am a resident of Vieques, but I currently live in San Juan, where I work and go school.

Regarding these areas that the Navy will be transferring, it is my opinion that these lands must remain property of Fish and Wildlife Service. The CERCLA process has not been fully completed yet, and there is still cleanup that needs to be done on West Vieques. At this time, it is unknown what kind of complications may arise as the clean up continues in the remaining areas.

I want that AOC J, R and SWMU 7, be designated ecological zones.

Sincerely,
Abreu Rosamy Ruiz
Rosamy22@gmail.com

8 de julio de 2011

Wilmarie Rivera
Coordinadora de Instalaciones Federales
Junta de Calidad Ambiental de Puerto Rico

Saludos cordiales,

Me dirijo a usted refiriéndome a los los comentarios públicos del Plan Propuesto de las áreas AOC J, R y SWMU 7. Soy residente de Vieques, aunque actualmente resido en San Juan, por motivos de estudios y trabajo.

Aportando mi opinión a la situación de los terrenos entregado por la Marina, entiendo que por el momento deben permanecer como propiedad del Servicio de Pesca y Vida Silvestre. Aún no han finalizado con los requisitos que indica la ley CERCLA y mucho menos han finalizado con toda la limpieza del área oeste de Vieques. A este momento no saben con qué complicaciones se pueden encontrar, según avancen con la limpieza de las restantes áreas.

Que las áreas AOC J, R y SWMU 7, permanezcan como zona ecológica.

Cordialmente,

Rosamy Abreu Ruiz
Rosamy22@gmail.com