



Proposed Remedial Action Plan

Solid Waste Management Unit 1

Atlantic Fleet Weapons Training Area - Vieques

Former Vieques Naval Training Range Vieques, Puerto Rico

July 2011

1 Introduction

This **Proposed Plan** identifies the rationale and preferred alternative for Solid Waste Management Unit (SWMU) 1, located at the Former Vieques Naval Training Range (VNTR) in Vieques, Puerto Rico. The Proposed Plan summarizes the site history, the results of previous environmental investigations, and the preferred alternative, and it provides the public with an opportunity to review and comment on the preferred alternative. SWMU 1, also known as the Camp García Landfill, was used from 1954 to 1978 for the disposal of municipal waste from Camp García.

This document is issued by the U.S. Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC) Atlantic Division, and the **U.S. Environmental Protection Agency (EPA)** Region 2, in consultation with the Puerto Rico **Environmental Quality Board (PREQB)**. The Proposed Plan fulfills the public participation requirements in Section 117(a) of the **Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)** and in Section 300.430(f)(2) of the **National Oil and Hazardous Substances Pollution Contingency Plan (NCP)**.

Based on current site conditions, future anticipated land and resource uses, and the results of environmental investigations at the site, the preferred alternative for SWMU 1 is Enhanced Native Soil Cover and Institutional Controls. The Navy and USEPA, in consultation with PREQB, will make the final decision on the remedial approach for SWMU 1 after reviewing and considering all information submitted during the 45-day public comment period. If warranted based on public comments and/or new information, the Preferred Alternative may be modified or an alternate remedy may be considered. Therefore, it is important to the remedy selection process that the public provide input on all alternatives and on the rationale for the Preferred Alternative.

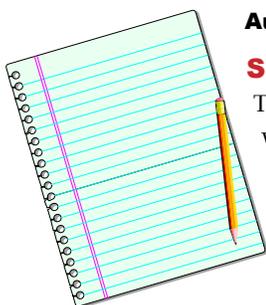
This Proposed Plan summarizes information that can be found in greater detail in the **Streamlined Remedial Investigation/ Feasibility Study (RI/FS) Report (CH2M HILL, 2011)**, and other documents contained in the **Administrative Record** for SWMU 1. A glossary of key terms used in this document is attached; these key terms are identified in bold print the first time they appear.

Mark Your Calendar for the Public Comment Period

Public Comment Period
August 1 - September 15, 2011

Submit Written Comments

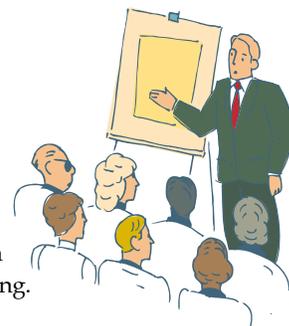
The Navy and USEPA will accept written comments on the Proposed Plan during the public comment period. To submit comments or obtain further information, please refer to the last page of this newsletter.



Attend the Public Meeting
August 17, 2011

Time - 5:00 pm to 7:00 pm
Place - Jorge's Ice House
Carr. 200, Km 3, hm 2
Barrio Martineau, Vieques, PR

The Navy will hold a public meeting to explain the rationale for the proposed no further action alternative. Verbal and written comments will also be accepted at this meeting.



Location of Information Repository

Historical records for SWMU 1, including the Final RI Report, on which this Proposed Plan is based, can be found in the Administrative Record file at the following location:

Biblioteca Electrónica

Benítez Guzmán Street, Corner with
Baldorioty de Castro Street
Isabel Segunda
Vieques, PR 00765
(787) 741-2114

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

2 Site Background

2.1 Facility Description and History

Vieques is located in the Caribbean Sea approximately 7 miles southeast of the eastern tip of the island of Puerto Rico (Figure 1). Vieques is the largest offshore island of the Commonwealth of Puerto Rico. It is approximately 20 miles long and 4.5 miles wide, and has an area of approximately 33,088 acres (51 square miles).

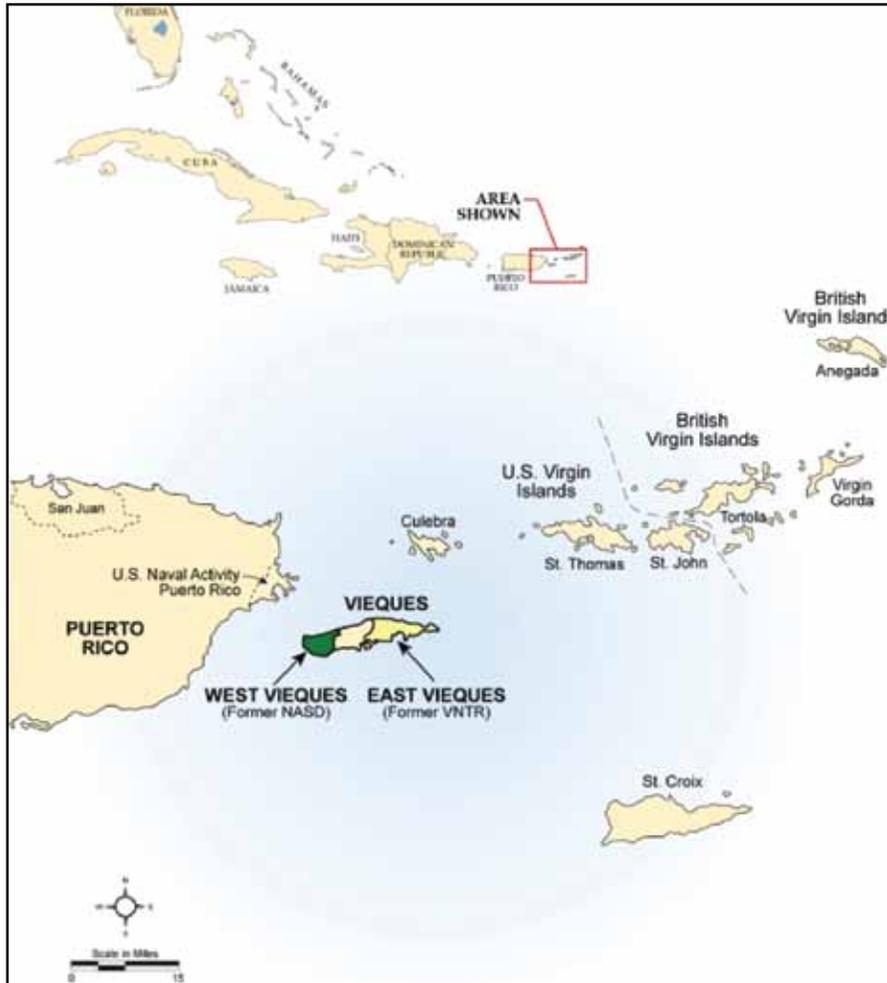


Figure 1 - Regional Location Map

The Navy purchased large portions of Vieques in the early 1940s to conduct activities related to military training. Operations within the Former Naval Ammunition Support Detachment (NASD; western one-third of Vieques) consisted mainly of ammunition loading and storage, vehicle and facility maintenance, and some training. Operations within the Former VNTR (eastern one-third of Vieques) comprised various aspects of naval gunfire training, including air-to-ground ordnance delivery and amphibious landings, as well as housing the main base of operations for these activities at Camp García. The VNTR is over 14,000 acres and comprises the Eastern Maneuver Area (EMA), Surface Impact Area (SIA), Live Impact Area (LIA), and Eastern Conservation Area (ECA) (Figure 2).

A Resource Conservation and Recovery Act (RCRA) Consent Order was signed in January 2000 to address known and potential environmental sites suspected of hazardous constituent releases. SWMU 1 was included in the RCRA Consent Order. The Navy ceased training exercises at the Former VNTR on April 30, 2003, in accordance with the Presidential Directive to the Secretary of Defense dated January 30, 2000, when the land was transferred to the **Department of Interior (DOI)**, to be managed by the **U.S. Fish and Wildlife Service (USFWS)** as a National Wildlife Refuge. On February 11, 2005, the Atlantic Fleet Weapons Training Area - Vieques (also known as AFWTA-Vieques) was added to the **National Priorities List (NPL)**, which required all subsequent environmental restoration activities for Navy Installation Restoration (IR) sites on Vieques to be conducted under CERCLA. On September 7, 2007, the Navy, DOI, EPA, and PREQB finalized a Federal Facility Agreement (FFA) that establishes the procedural framework and schedule for implementing the CERCLA response actions for Vieques. Although the DOI is directed to protect and conserve the transferred land as a wildlife refuge, the Navy retains the responsibility for conducting the environmental investigations and clean-up of the property, as warranted.

2.2 Site Description

SWMU 1 is approximately 41 acres in size and located within a valley east of Camp García, on the EMA of the Former VNTR (Figure 3). SWMU 1 was a landfill used from 1954 to 1978 for the disposal of municipal waste from Camp García. Approximately 1,800 to 3,120 tons of waste was disposed in the landfill, but no hazardous materials reportedly were placed in the disposal area. During operation, materials were disposed in trenches, which were then covered with about 6 inches of soil to control blowing of litter. A final 2-foot (ft) thick soil cover, consisting of compacted native soils, was placed over the trenches. Currently, the landfill is densely vegetated and only small, isolated areas of landfill waste are exposed on the surface.

SWMU 1 is located on U.S. property managed by the DOI that has been designated as a wildlife refuge. As set forth in the land transfer agreement between the DOI and Navy, DOI agreed that use and access in areas that could potentially impact the remedy at environmental sites would be limited until CERCLA related activities are completed. Based on the above, access to SWMU 1 is restricted from the public.

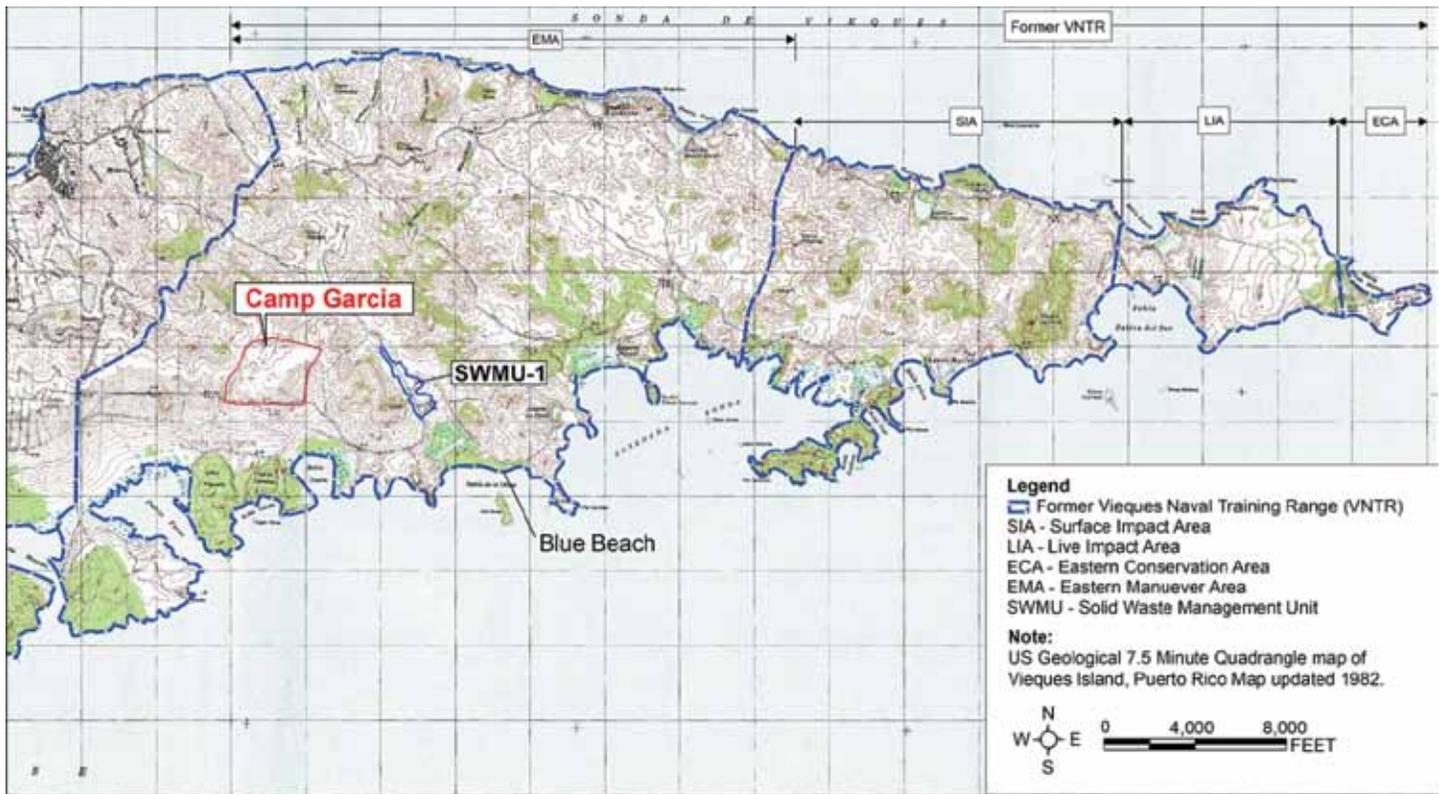


Figure 2 – Former VNTR and SWMU 1 Location Map

An **ephemeral stream** runs along the eastern boundary of SWMU 1. Surface water only occurs within the ephemeral stream during periods of heavy and prolonged rainfall.

2.3 Summary of Previous Investigations

Previous environmental investigations have been conducted at SWMU 1, beginning in 1978. The following subsections briefly summarize the purpose and scope of investigations completed to date.

Environmental Impact Statement (1979)

An Environmental Impact Statement (EIS) was conducted from 1978 to 1979 to evaluate the environmental impacts of the continued use of the Naval facilities on Vieques (Tippetts-Abbett-McCarthy-Stratton and Ecology and Environment, Inc. [TAMS/E&E], 1979). The EIS report presents the history of military use and the types and quantities of munitions used on the VNTR. SWMU 1 is discussed briefly; the EIS notes *“The Navy has submitted an application for a permit and an operating plan for the sanitary landfill at Camp Garcia; however, a permit for this facility has not yet been issued by PREQB.”*

Initial Assessment Study (1984)

An Initial Assessment Study (IAS) was conducted in 1984 to identify and assess sites posing potential threats to human health or to the environment. It was determined that SWMU 1 did not include hazardous materials and that the wastes did not present a threat to groundwater and wildlife at the site (Greenleaf/Telesca and E&E, 1984).

Phase II RCRA Facility Assessment (1988)

A Phase II RCRA Facility Assessment (RFA) was conducted in 1988 to evaluate past, present, or potential future releases of hazardous waste or hazardous constituents from any unit or activity that involved management of solid waste (Kearney, 1988). Although historical information suggested hazardous materials were not disposed of at SWMU 1, the Phase II RFA Report recommended soil sampling at the site.

Revised RCRA Facility Assessment (1995)

A Revised RFA, prepared by the Land Pollution Control Area Hazardous Waste Bureau of the Puerto Rico Environmental Quality Board (PREQB, 1995), identified SWMUs and Areas of Concern (AOCs) that could have potential releases of hazardous wastes or hazardous constituents at the former VNTR. Like the previous report, the revised report recommended soil sampling at SWMU 1.

Current Conditions Evaluation (2001)

The Current Conditions Report (CH2M HILL, 2001) summarizes the Aerial Photographic Analysis study (Environmental Research, Inc. [ERI], 2000) and discusses the conditions at SWMU 1 and other sites, based on an archive records search and interviews with former employees. The aerial photographic analysis of the landfill indicated that the fill area extended over an area of approximately 55 acres. The analysis of aerial photographs from 1959, 1962, 1964, and 1970 identified several apparent trenches

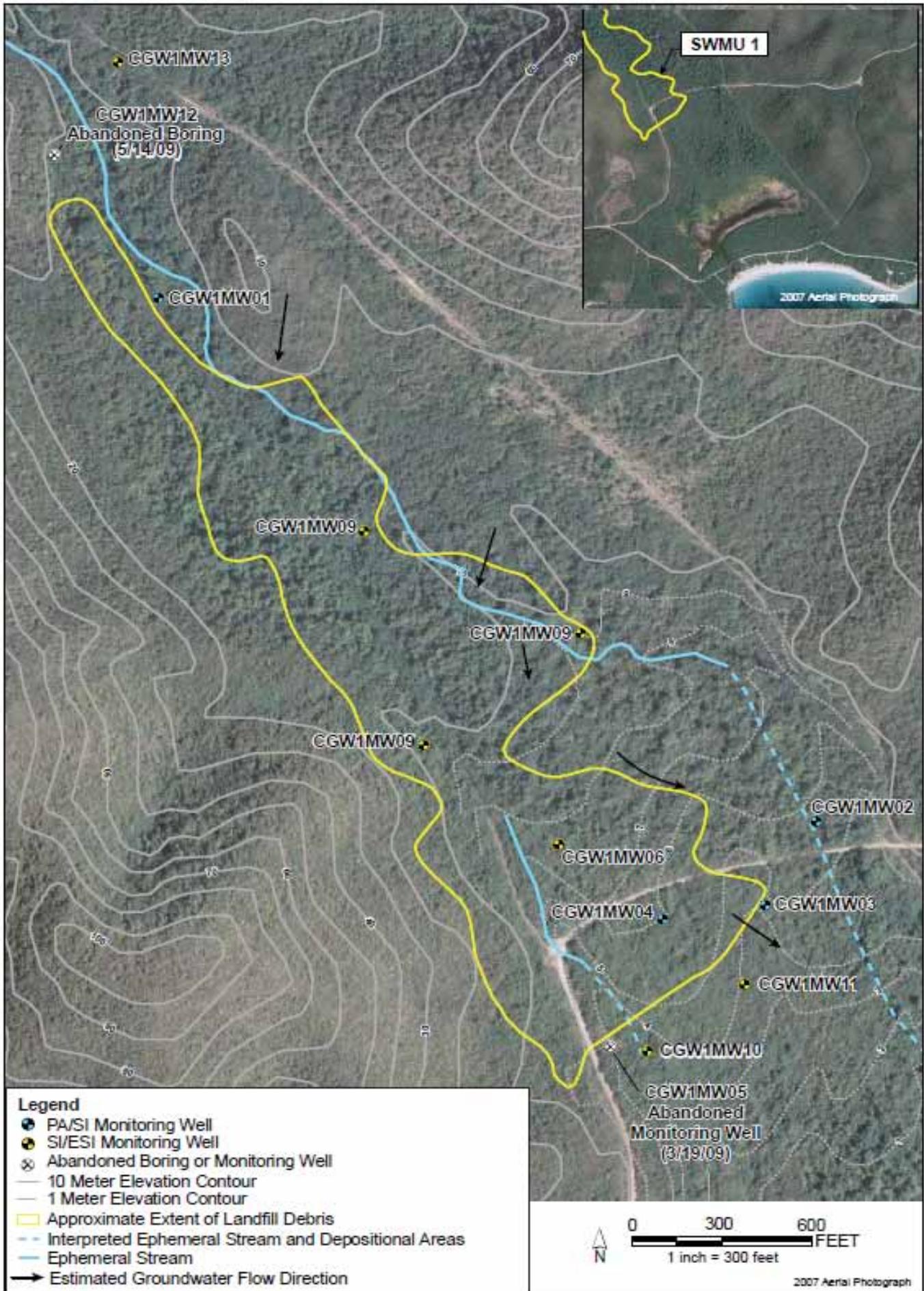


Figure 3 - SWMU 1 Aerial Photograph

and landfill cells, as well as ground scarring and cleared vegetation. It is important to note that features identified by ERI on the aerial photographs are not necessarily accurate because a site visit was not performed to substantiate the features noted in the aerial photographs, and the photographic analysis was done many years after the aerial photographs were taken. However, the information garnered from the aerial photographs does provide a general indication of past practices associated with the landfill.

Environmental Baseline Survey (2003)

An Environmental Baseline Survey (EBS) was conducted in 2003 to disclose relevant information regarding the conditions of the Former VNTR prior to property transfer (Naval Facilities Engineering Command, 2003). SWMU 1 is identified as requiring further investigation.

Phase I RCRA Facility Investigation (2004)

During the Phase I RCRA Facility Investigation (RFI), a **geophysical survey** was conducted to identify where waste material was likely buried within SWMU 1. In addition, fifty surface soil samples were collected throughout the landfill, focusing primarily on the areas where geophysical anomalies were identified, and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, herbicides, polychlorinated biphenyls (PCBs), dioxins/furans, inorganics, and explosives. Five monitoring wells were installed at SWMU 1 to characterize groundwater conditions immediately down-gradient of the landfill (*Figure 3*). Delineation of the northern and southern landfill boundaries was not completed during the Phase I RFI. The results of the Phase I RFI were documented in a Preliminary Assessment/Site Inspection (PA/SI) report (CH2M HILL, 2008) because Vieques was placed on the NPL between the time the Phase I RFI was completed and the report was finalized.

Background Investigation (2007)

A **background** study was conducted in 2007 in the eastern portion of Vieques to develop a set of background values for inorganic constituents in soil to help distinguish inorganic concentrations that may be present as a result of a site-related release from those not attributable to a site-related release (CH2M HILL, 2007). The background data were collected specifically from the eastern portion of Vieques to represent soil types similar to those where environmental sites are located in the Former VNTR. The background inorganic constituent concentrations were used for comparison with the soil inorganic constituent concentrations collected during the environmental investigations at SWMU 1.

Site Inspection/Expanded Site Inspection (2009)

A Site Inspection/Expanded Site Inspection (SI/ESI) was conducted from 2008 to 2009 to delineate the nature and extent of the landfill waste and if there had been con-

taminant release(s) at the site (CH2M HILL, 2010). A geophysical survey and forty-nine exploratory excavations resulted in a conclusion that the landfill is approximately 41 acres in size with landfill debris extending to a depth of 10.5 ft below ground surface (bgs). Soil samples were collected within the landfill soil cover, within the landfill debris, beneath the landfill debris to assess the potential for leaching to groundwater, and within potential migration pathways such as the ephemeral stream. Seven additional monitoring wells were installed within, upgradient, and downgradient of the landfill (*Figure 3*). Samples were analyzed for VOCs, SVOCs, pesticides, PCBs, explosives, and inorganics.

Streamlined Remedial Investigation/Feasibility Study (2011)

A Streamlined Remedial Investigation/Feasibility Study (RI/FS) (CH2M HILL 2011) was conducted to assess the nature and extent of contamination, assess potential risks to human health and the environment, and evaluate presumptive remedial alternatives at SWMU 1. Data collected as part of the Phase I RFI and the SI/ESI sufficiently characterized the site and were therefore used in the Streamlined RI/FS. The conclusion of the RI was that the landfill debris is primarily municipal-type debris overlain by a 2-ft thick soil cover with a few localized areas that have landfill debris exposed at the ground surface, and that there were no **unacceptable risks** to human health or the environment posed by contaminant levels identified at the site. However, this conclusion relied upon maintaining the current land use and controlling access to subsurface landfill debris and associated contamination.

The focused FS analyzed presumptive remedial alternatives for SWMU 1, in accordance with EPA's guidance on presumptive remedies for municipal and military landfills. A more detailed description of the focused FS is presented in Section 7.

The findings of the SWMU 1 RI/FS were presented by the Navy to the Vieques Restoration Advisory Board (RAB) in April 2011.

3 Site Characteristics

3.1 Physical Characteristics

SWMU 1 is situated in a valley that gently slopes from the northwest to the southeast, with an approximate 55-foot (ft) elevation change. SWMU 1 is bounded by steep hills to the west and an ephemeral stream and steep hills to the east. The site is densely vegetated, dominated by thick thorn scrub. Surface water occurs within the ephemeral stream only during periods of heavy and prolonged rainfall.

Groundwater at SWMU 1 is within alluvial deposits (Qa), saprolite, and fractured volcanic bedrock (Kv) and ranges

in elevation from 23 to -3 ft above mean sea level (amsl). Groundwater flows generally to the south in the northern portion of the site and to the southeast in the southern portion of the site, generally mimicking the land topography, at a velocity that ranges from 17 to 158 ft/year.

The Site is on a designated wildlife refuge where it is anticipated that the future land use will remain the same. Groundwater beneath SWMU 1 is classified by the Commonwealth of Puerto Rico as SG. Groundwater is currently not used as a potable water source at or in the vicinity of SWMU 1, and there are no plans for potable use of groundwater in this area. Groundwater beneath SWMU 1 is generally brackish and becomes saline in the southern portion of the Site because of its close proximity to the sea (total dissolved solids concentrations range from 1,400 to 18,000 mg/L as measured during the ESI). No archaeological or cultural resources are located within SWMU 1.

3.2 Nature and Extent of Contamination

Geophysical surveys, exploratory excavations, and media analytical data collected during the PA/SI and SI/ESI (as documented in the RI/FS Report) provide the primary basis for the evaluation of the nature and extent of the landfill debris and associated contamination.

The landfill debris is primarily municipal-type debris, such as waste paper, corrugated containers, cans and food packaging material, rags, wood, scrap metal, and yard waste, that was disposed in trenches between 1954 and

1978. Several munitions-related items (i.e., spent ammunition, small arm cartridges, and practice items) were also observed. The depth of the landfill debris is variable across the site; however, it was observed to a depth of 10.5 feet bgs. Randomly distributed areas have landfill debris exposed on the surface at SWMU 1, either from soil erosion, incomplete placement of the initial cover, or disturbance during the investigations.

In general, constituents detected above regulatory screening criteria and background concentrations in soil primarily occurred within the extent of the landfill. One SVOC, 3 pesticides, and 11 inorganic constituents were detected above screening criteria and background concentrations (for inorganics) in the surface soil landfill cover (Table 1).

3.3 Fate and Transport

The potential for migration of constituents in SWMU 1 environmental media from wind erosion, volatilization, surface runoff, leaching to groundwater, and from groundwater flow is minimal. The 2-ft thick soil cover and vegetation reduces the potential for wind erosion and surface runoff. Volatile constituents observed in groundwater were at low concentrations such that volatilization is likely negligible. The groundwater monitoring data, and considering the number of years that the waste has been in place (between 30 and 55 years), indicate that the potential for leaching from the landfill is minimal.

	Maximum Concentration Detected Above Screening Criteria and Background ¹					Screening Criteria				
	Cover Material Surface Soil	Ephemeral Stream Surface Soil	Subsurface Soil Within Landfill Debris	Subsurface Soil Beneath Landfill Debris	Ephemeral Stream Subsurface Soil	East Vieques Background Value ² (Kv)	East Vieques Background Value ² (Qa)	Background ² Range	May 2010 RSL for Residential Soil, Adjusted	Ecological
Semivolatile Organic Compounds (ug/kg)										
Benzo(a)pyrene	46J	--	--	--	--	--	--	--	15	--
Pesticides/Polychlorinated Biphenyls (ug/kg)										
4,4'-DDD	--	--	700,000	--	--	--	--	--	2,000	--
4,4'-DDE	190	--	71,000	--	--	--	--	--	1,400	21
4,4'-DDT	58J	--	38,000	--	--	--	--	--	1,700	21
Dieldrin	--	--	130,000	100J	--	--	--	--	30	--
Endrin	--	--	7,600	--	--	--	--	--	1,800	--
Endrin ketone	4.9J	--	--	--	--	--	--	--	1,800	1.95
gamma-Chlordane	--	--	35,000	--	--	--	--	--	1,600	--
Total Inorganics (mg/kg)										
Aluminum	--	--	42,500	45,400	48,000	35,000	35,000	2,340 - 41,500	7,700	--
Antimony	--	--	174J	--	--	5.8	5.8	--	3.1	--
Arsenic	4.3	3.6	35J	3.0	3.8	1.6	1.6	0.47 - 5	0.39	18
Barium	--	--	514	411J	--	212	212	21 - 344	1,500	--
Chromium	113J	--	2,320J	85	78	72	72	2.3 - 72	0.29	26
Cobalt	32J	28	43	43	35	26	16	2.4 - 19.4	2.3	13
Copper	145	--	23,400	57	--	94	53	3.3 - 102	310	28
Iron	--	50,100	153,000	56,500	50,000	43,200	38,100	1,500 - 38,100	5,500	--
Lead	37	--	1,860	117	--	5.4	5.4	0.98 - 4.5	400	11
Manganese	--	--	--	--	--	--	--	--	--	--
Mercury	0.19	--	--	--	--	0.057	0.057	0.05 - 0.11	0.78	0.10
Nickel	--	--	434J	--	--	41	22	0.87 - 40	150	--
Selenium	1.4	0.88	0.83J	0.83	--	0.51	0.51	0.32 - 0.51	39	0.52
Thallium	4.4J	--	--	--	--	0.13	0.13	0.013 - 0.41	--	1.0
Vanadium	192	196	530	225	154	144	144	13.4 - 142	39	7.8
Zinc	521J	--	--	--	--	32	32	4 - 122	2,300	46

¹ - values are only present if concentrations exceeded media specific screening values and background

² - background study was approved by EPA and PREQB

RSL - Regional Screening Level mg/kg - milligrams per kilogram

Table 1 - Soil Exceedance Results

COPC	Maximum Concentration Detected Above Screening Criteria and Background ¹	Screening Criteria			
		MW13 Background	May 2010 RSL for Tap Water, Adjusted	Puerto Rico Water Quality Standards - 2010	MCL - Groundwater
Volatile Organic Compounds (µg/L)					
Chloroform	3	--	0.19	57	--
Total Inorganics (µg/L)					
Antimony	3.3J	1.0 U	1.5	5.6	6.0
Arsenic	7.5	5.0 U	0.045	10	10
Chromium	29	3.0 U	0.043	100	100
Cobalt	41	1.0 U	1.1	--	--
Manganese	13,700	28	88	--	--
Mercury	1.9	0.20 U	0.37	0.05	2.0
Thallium	5.1J	1.0 U	--	0.24	2.0
Vanadium	32J	12	18	--	--
Dissolved Inorganics (µg/L)					
Antimony	2.8J	1.0 U	1.5	5.6	6.0
Arsenic	7.8	5.0 U	0.045	10	10
Chromium	9.9J	3.0 U	0.043	100	100
Cobalt	40	1.0 U	1.1	--	--
Manganese	13,500	28	88	--	--
Mercury	0.46	0.20 U	0.37	0.05	2.0
Thallium	3	1.0 U	--	0.24	2.0
Vanadium	23	11	18	--	--

¹ - values are only present if concentrations exceeded media specific screening values and background

RSL – Regional Screening Level

MCL – Maximum Contaminant Level

ug/L - micrograms per liter

Table 2 - Groundwater Exceedance Results

4 Summary of Site Risks

A summary of the Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA) conducted for SWMU 1 during the RI/FS is included in the following subsections and in (Table 3). The complete HHRA and ERA are provided in the RI/FS Report, which is available in the Administrative Record File.

4.1 Human Health Risk Assessment

The RI HHRA was conducted to evaluate potential human health risks associated with exposure to soil at SWMU 1. Health risks are based on a health-protective estimate of the potential carcinogenic risk and the potential non-cancer hazard, which is expressed as a hazard index (HI). Exposure scenarios evaluated for site media included adult trespassers and USFWS workers, based on current and future land use. Conservative exposure pathways included ingestion, dermal contact, and inhalation of chemicals in ephemeral stream surface soil and landfill cover surface soil.

No **unacceptable risks** were identified for human receptors based on exposure scenarios at SWMU 1 (risk estimates are below threshold values as summarized in

(Table 3). However, this determination is based under the assumption that the land use remains the same and access to subsurface debris and associated contamination is restricted.

4.2 Ecological Risk Assessment

The RI ERA was conducted to determine if potential risks to ecological receptors are present that warrant additional assessment or action. The site is relatively undisturbed and provides suitable terrestrial habitat for a variety of plant, invertebrate, reptile, bird, and mammal communities. The adjacent ephemeral stream provides limited exposure pathways to invertebrate and plant aquatic communities because it is generally dry. Therefore, the ephemeral stream was more appropriately evaluated as a terrestrial habitat. No unacceptable risks to directly exposed plants and animals and other wildlife potentially feeding on those plants and animals were identified. Chemicals detected above ecological screening criteria were attributable to background or had infrequent detections. Detailed information is provided in the SWMU 1 RI/FS Report.

Media	Human Health Risk	
	Current/Future Trespasser	Current/Future USFWS Worker
Ephemeral Stream Surface Soil	ELCR = 1×10^{-6} and HI = 0.1 Acceptable	ELCR = 5×10^{-7} and HI = 0.003 Acceptable
Landfill Cover Surface Soil	ELCR = 6×10^{-7} and HI = 0.04 Acceptable	ELCR = 1×10^{-7} and HI = 0.001 Acceptable
Subsurface Soil	No Exposure Pathway ¹	No Exposure Pathway ¹
Groundwater	No Exposure Pathway ¹	No Exposure Pathway ¹
ELCR – excess lifetime cancer risk HI – hazard index ¹ – A Land Use Control will be implemented to restrict debris and subsurface soil disturbance, occupied buildings, and potable use of groundwater (data supports that the site’s impacts to groundwater are negligible). The Land Use Control is a legal or administrative mechanism that restricts the use of or limits access to prevent or reduce risks to human health and the environment. The Land Use Control at SWMU 1 will prevent unauthorized and uncontrolled subsurface excavation and groundwater use, which will result in no potential exposure to debris, contaminated subsurface soil, or groundwater at the site.		
Media	Ecological Risk	
	All Receptors	
Surface Soil	Acceptable	

Table 3 – SWMU 1 Risk Assessment Results

5 Scope and Role of Response Action

In cooperation with USEPA, PREQB, and USFWS, and in accordance with applicable guidance, the Navy performed investigations at SWMU 1 to evaluate the nature and extent of contamination associated with past releases of CERCLA-related contamination and to assess the potential risks to human health and the environment posed by that contamination, and the Navy also analyzed presumptive remedial alternatives for addressing the landfill debris and associated contamination at SWMU 1. The preferred alternative presented in this Proposed Plan is intended to address potentially unacceptable risks to receptors exposed from direct contact with subsurface landfill debris and associated contamination, minimize the potential for erosion of landfill debris, and ensure that land use within the landfill boundaries is controlled. The response action is intended to be the final remedy for SWMU 1, and does not include or affect any other sites at the facility under the CERCLA process.

6 Remedial Action Objectives

Remedial action objectives (RAOs) are statements that define the extent to which sites require cleanup to protect human health and the environment. The RAOs reflect the landfill debris, associated contamination, and exposure routes and receptors at SWMU 1. The RAOs for SWMU 1 are as follows:

- Prevent direct contact with surface and subsurface landfill debris and associated contamination that would potentially pose an unacceptable risk to exposed receptors.

- Minimize the potential for erosion of landfill debris.
- Ensure land use (including the use of groundwater) within the landfill boundaries is controlled, unless or until additional action is implemented that mitigates potentially unacceptable risks associated with unrestricted land use.

An RAO for groundwater is not necessary because there is no groundwater contamination requiring remediation and no evidence that leaching is a concern. However, long-term groundwater monitoring will be conducted to determine if a future release from the landfill occurs that results in groundwater contamination that may necessitate a groundwater remedy. If long-term monitoring indicates a groundwater remedy is warranted in the future, the Record of Decision (ROD) will be amended and a groundwater RAO(s) will be developed at that time. The long-term monitoring plan will include the details of the long-term groundwater monitoring, including the types of results that may trigger groundwater remediation, modification of the long-term monitoring plan, and long-term monitoring exit conditions.

Since the HHRA and ERA for SWMU 1 resulted in a conclusion that there are no unacceptable risks from exposure to surface soil at SWMU 1 and the existing land use is a wildlife refuge and because the future land use will remain the same, specific remediation goals (cleanup levels) are not necessary. However, exposed debris within the landfill boundaries will be covered to ensure direct contact is prevented and the potential for erosion is minimized. In addition, long-term monitoring of groundwater at SWMU 1 will be conducted to determine if a future release from the landfill occurs that results in groundwater contamination that may necessitate a groundwater

What is Human Health Risk and How is it Calculated?

A **human health risk assessment (HHRA)** estimates the likelihood of health problems occurring if no cleanup action were taken at a site. This is also referred to as “baseline risk.” HHRAs are conducted using a step-wise process (as outlined in Navy and USEPA HHRA policy and guidance). To estimate baseline risk at a site, the Navy performs the following four-step process:

Step 1: Data Collection and Evaluation

Step 2: Exposure Assessment

Step 3: Toxicity Assessment

Step 4: Risk Characterization

During Data Collection and Evaluation (**Step 1**), the concentrations of chemicals detected at a site are evaluated, including:

- Identifying and evaluating area(s) where site-related chemicals may be found (source areas) and at what concentrations.
- Evaluating potential movement (transport) of chemicals in the environment.
- Comparing site concentrations to risk-based screening levels to determine which chemicals may pose the greatest threat to human health (called “chemicals of potential concern” [COPCs]). The USEPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil and tap water are used to identify COPCs for a site.

In **Step 2**, the Exposure Assessment, potential exposures to the COPCs identified in Step 1 are evaluated. This step includes:

- Identifying possible exposure media (soil, air, groundwater, surface water, sediment).
- Evaluating if/how people may be exposed (exposure pathways).
- Evaluating routes of exposure (for example, ingestion).
- Identifying the concentrations of COPCs to which people might be exposed.
- Identifying the potential frequency and length of exposure.
- Calculating a “reasonable maximum exposure” (RME) dose that portrays the highest level of human exposure that could reasonably be expected to occur.

In the Toxicity Assessment (**Step 3**), both cancer and non-cancer toxicity values are identified for oral, dermal, and inhalation exposures to the COPCs. The toxicity values are identified using the hierarchy of toxicity value sources approved by USEPA.

Step 4 is Risk Characterization, where the information developed in Steps 1-3 is used to estimate potential risk to people. The following approach is used:

- Two types of risk are considered: cancer risk and non-cancer hazard.
- The likelihood of developing cancer as a result of site exposure is expressed as an upper-bound probability; for example, a “1 in 10,000 chance.” In other words, for every 10,000 people that might be exposed under the conditions identified in Step 2, one additional case of cancer may occur as a result of site exposure. An additional cancer case indicates one more person than the number that may get cancer without site exposure.
- For non-cancer health effects, a “hazard index” (HI) is calculated. The HI represents the ratio between the “reference dose,” which is the dose at which no adverse health effects are expected to occur, and the RME dose for a person contacting COPCs at the site. The key concept here is that a “threshold level” (measured as a HI of 1) exists below which no non-cancer health effects are expected to occur.
- The potential risks from the individual COPCs and exposure pathways are summed and a total site risk is calculated for each receptor.
- The risk estimates are evaluated to determine if they are high enough to cause health problems for people at or near the site.
- The uncertainties associated with the risk estimates are presented and their effects on the conclusions of the HHRA are discussed.

What is Ecological Risk and How is it Calculated?

An ecological risk assessment (ERA) is conceptually similar to a human health risk assessment except that it evaluates the potential risks and impacts to ecological receptors (plants, animals other than humans and domesticated species, habitats [such as wetlands], and communities [groups of interacting plant and animal species]). ERAs are conducted using a tiered, step-wise process (as outlined in Navy and USEPA ERA policy and/or guidance) and are punctuated with Scientific Management Decision Points (SMDPs). SMDPs represent points in the ERA process where agreement among stakeholders on conclusions, actions, or methodologies is needed so that the ERA process can continue (or terminate) in a technically defensible manner. The results of the ERA at a particular SMDP are used to determine how the ERA process should proceed, for example, to the next step in the process or directly to a later step. The process continues until a final decision has been reached (i.e., remedial action if **unacceptable risks are identified**, or no further action if risks are acceptable). The process can also be iterative if data needs are identified at any step; the needed data are collected and the process starts again at the point appropriate to the type of data collected.

An ERA has three principal components:

1. Problem Formulation establishes the goals, scope, and focus of the ERA and includes:

- Compiling and reviewing existing information on the habitats, plants, and animals that are present on or near the site.
- Identifying and evaluating area(s) where site-related chemicals may be found (source areas) and at what concentrations.
- Evaluating potential movement (transport) of chemicals in the environment.
- Identifying possible exposure media (soil, air, water, sediment).
- Evaluating if/how the plants and animals may be exposed (exposure pathways).
- Evaluating routes of exposure (for example, ingestion).
- Identifying specific receptors (plants and animals) that could be exposed.
- Specifying how the risk will be measured (assessment and measurement end-points) for all complete exposure pathways.

2. Risk Analysis which includes:

- Exposure Estimate - An estimate of potential exposures (concentrations of chemicals in applicable media) to plants and animals (receptors). This includes direct exposures of chemicals in site media (such as soil) to lower trophic level receptors (organisms low on the food chain such as plants and insects) and upper trophic level receptors (organisms higher on the food chain such as birds and mammals). This also includes the estimated chemical dose to upper trophic level receptors via consumption of chemicals accumulated in lower food chain organisms.
- Effects Assessment - The concentrations of chemicals at which an adverse effect may occur are determined.

3. Risk Calculation or Characterization:

- The information developed in the first two steps is used to estimate the potential risk to plants and/or animals by comparing the exposure estimates with the effects thresholds.
- Also included is an evaluation of the uncertainties (potential degree of error) that are associated with the predicted risk estimate and their effects on the conclusions that have been made.

The three principal components of an ERA are implemented within the framework of an 8-step, 3-tiered process as follows:

1. Screening Level ERA (Steps 1-2; Tier 1) – The Screening Level ERA (SLERA) conducts an assessment of ecological risk using the three steps described above and very conservative assumptions (such as using maximum chemical concentrations).
2. Baseline ERA (Steps 3-7; Tier 2) – If potential risks are identified in the SLERA, a Baseline ERA (BERA) is typically conducted. The BERA is a reiteration of the three steps described above but uses more site-specific and realistic exposure assumptions, as well as additional methods not included in the SLERA, such as consideration of background concentrations. The BERA may also include the collection of site-specific data (such as measuring the concentrations of chemicals in the tissues of organisms, such as fish) to address key risk issues identified in the SLERA.
3. Risk Management (Step 8; Tier 3) – Step 8 develops recommendations on ways to address any unacceptable ecological risks that are identified in the BERA and may also include other activities such as evaluating remedial alternatives.

remedy. The details of the long-term groundwater monitoring program will be articulated in the long-term monitoring and operations and maintenance plan prepared based on criteria set forth in the ROD for this Site.

7 Summary of Remedial Alternatives

Presumptive remedies are preferred technologies for common categories of sites (such as military landfills) and are expected to be used at applicable sites. The presumptive remedy approach has the advantage of streamlining the feasibility study and accelerating the final remedial determination and, ultimately, site cleanup, because it takes advantage of a process that has been applied consistently, historically, and successfully to many similar sites. Source containment is USEPA's established presumptive remedy for municipal landfill sites regulated under CERCLA, which is also applicable to landfills at military sites such as SWMU 1. Additional details related to the presumptive remedial approach for SWMU 1 is provided in the RI/FS Report.

The Streamlined FS uses the conceptual site model to develop RAOs and performance criteria, and to evaluate remedial alternatives. Each remedial alternative for SWMU 1 was evaluated with respect to the nine evaluation criteria provided in the NCP. The alternatives were then compared to one another with respect to each NCP criterion.

Presumptive remedial alternatives developed and evaluated to address the landfill debris and associated soil contamination at SWMU 1 are detailed in the RI/FS Report. By accelerating the remedy selection process, presumptive remedies are expected to ensure the consistent selection of remedial actions and reduce the cost and time required to address similar sites. The EPA directive establishes source containment as the presumptive remedy for CERCLA municipal landfills and similar military landfills.

Three presumptive remedial alternatives were developed for detailed evaluation and are summarized in Table 4 and shown in Figures 4 and 5. Each alternative, with the exception of the no-action alternative, was developed to meet the RAOs. Consistent with the NCP, a no action alternative was evaluated as a baseline for the comparative analysis.

The NCP outlines the approach for comparing remedial alternatives. Evaluation of the alternatives uses nine evaluation criteria, which consist of "threshold," "primary balancing," and "modifying" criteria (Table 5). To be considered for selection as the preferred alternative, a remedial alternative must first meet two threshold criteria. The primary balancing criteria, which are technical criteria based on environmental protection, cost, and engineering feasibility, are then considered to determine

which alternative provides the best combination of attributes. Finally, upon receipt of public comments on this Proposed Plan, the preferred alternative is evaluated further against two modifying criteria.

The three remedial alternatives presented in Section 7 were evaluated against the first seven of the nine criteria identified in the NCP. The two remaining criteria will be considered after the public comment period for this Proposed Plan.

7.1 Relative Evaluation of Alternatives

The comparative analysis of alternatives with respect to the first seven evaluation criteria is summarized below. The SWMU 1 RI/FS Report provides a more-detailed discussion of the evaluation. (Table 6) provides a relative ranking of the alternatives.

Threshold Criteria

Overall Protection of Human Health and the Environment. Alternative 1 (no action) does not achieve RAOs. Both of the other alternatives are protective of human health and the environment and reduce the exposure to waste and soil by controlling land use and access and either enhancing the existing soil cover or providing additional soil cover.

Compliance with ARARs. All alternatives except Alternative 1 can comply with the ARARs. A complete list of the ARARs are included in the SWMU 1 RI/FS Report.

Primary Balancing Criteria

Long-Term Effectiveness and Permanence. Each of the alternatives, with the exception of Alternative 1, is expected to achieve long-term effectiveness and permanence as long as the RAOs are met. Alternatives 2 and 3 use soil cover to minimize contact and rely on ICs to prevent disturbance to landfill debris and soil. The ICs for both alternatives are adequate and reliable, because there would be limited access and future excavations would be controlled. Since Alternative 3 provides additional 2-ft thick soil cover over the existing 2-ft native soil cover, Alternative 3 would theoretically provide additional long-term protection against erosion relative to Alternative 2. However, the long-term effectiveness of erosion control for Alternative 2 is adequate with proper inspection and maintenance.

Reduction in Toxicity, Mobility, or Volume through Treatment. No alternative would result in any reduction of volume, toxicity, or mobility by treatment. As a result there is no difference among Alternatives 1, 2, and 3 under this criterion.

Short-Term Effectiveness. A sustainability analysis was also conducted for each of the three remedial alternatives as part of this criterion for consideration. Sustainability is a greening process focused on energy conservation, reduction of

Alternative	Components	Details	Cost
1. No Action <i>No action and no restriction on activities.</i>	-N/A	-No action -Perform 5-year reviews and reporting since debris and hazardous substances would remain at the site at concentrations that do not allow unlimited use and unrestricted exposure.	Total Present-Worth Cost: \$95,000 Discount Rate: 2.7% Assumed timeframe: 30 years
2. Enhanced Native Soil Cover and Institutional Controls (ICs) <i>Prevents direct contact with the landfill debris and associated soil contamination and minimizes potential for erosion. Ensures land use is controlled.</i>	-Enhance existing soil cover -ICs -Long Term Monitoring (LTM) and Operations and Maintenance (O&M)	-Enhancing the existing soil cover by covering the exposed waste areas with 18 inches of soil fill and 6 inches of top soil to promote vegetative growth. Re-vegetate work areas. -Implementing physical barriers (boundary survey, fencing, gates, and signage), and ICs (restrictive covenants) to control future residential or industrial land use, unauthorized and uncontrolled excavation and drilling at the site, and any land surface activities that permanently expose waste materials or release associated contamination. The IC boundary encompassing the landfill waste area would be surveyed by a professional land surveyor. -Perform LTM of groundwater and O&M of the soil cover and fencing. -Perform 5-year reviews and reporting since debris and hazardous substances would remain at the site at concentrations that do not allow unlimited use and unrestricted exposure.	Capital Cost: \$405,000 Present Value of Future, Annual Operations and Maintenance (O&M) Costs: \$853,000 Total Present-Worth Cost: \$1,258,000 Discount Rate: 2.7% Assumed timeframe: 30 years
3. Additional Soil Cover and ICs <i>Provides an additional protection against direct contact with the landfill debris and associated soil contamination and minimizes potential erosion. Ensures land use is controlled.</i>	-Install additional 2-foot thick cover (41 acres) - ICs -LTM and O&M	-Installing an additional 2-foot thick soil cover (with 18 inches of soil fill and 6 inches of top soil) over the entire 41-acre landfill area. -Re-establishing the vegetation with sustainable native plant species for added benefits as wildlife habitats, without mowing requirements. -A perimeter zone of Rip Rap material would be established as a long-term erosion control. These engineering controls would provide run-on and run-off control and reduce infiltration. -Implementing physical barriers (boundary survey, fencing, gates, and signage) and ICs (restrictive covenants) to control future residential and industrial land use, unauthorized and uncontrolled excavation and drilling at the site, and any land surface activities that permanently expose waste materials or release associated contamination. The IC boundary encompassing the landfill waste area would be surveyed by a professional land surveyor. -Perform LTM of groundwater and O&M of the soil cover and fencing. -Perform 5-year reviews and reporting since debris and hazardous substances would remain at the site at concentrations that do not allow unlimited use and unrestricted exposure.	Capital Cost: \$5,758,000 Present Value of Future, Annual O&M Costs: \$853,000 Total Present-Worth Cost: \$6,611,000 Discount Rate: 2.7% Assumed timeframe: 30 years

Table 4 – Remedial Alternatives

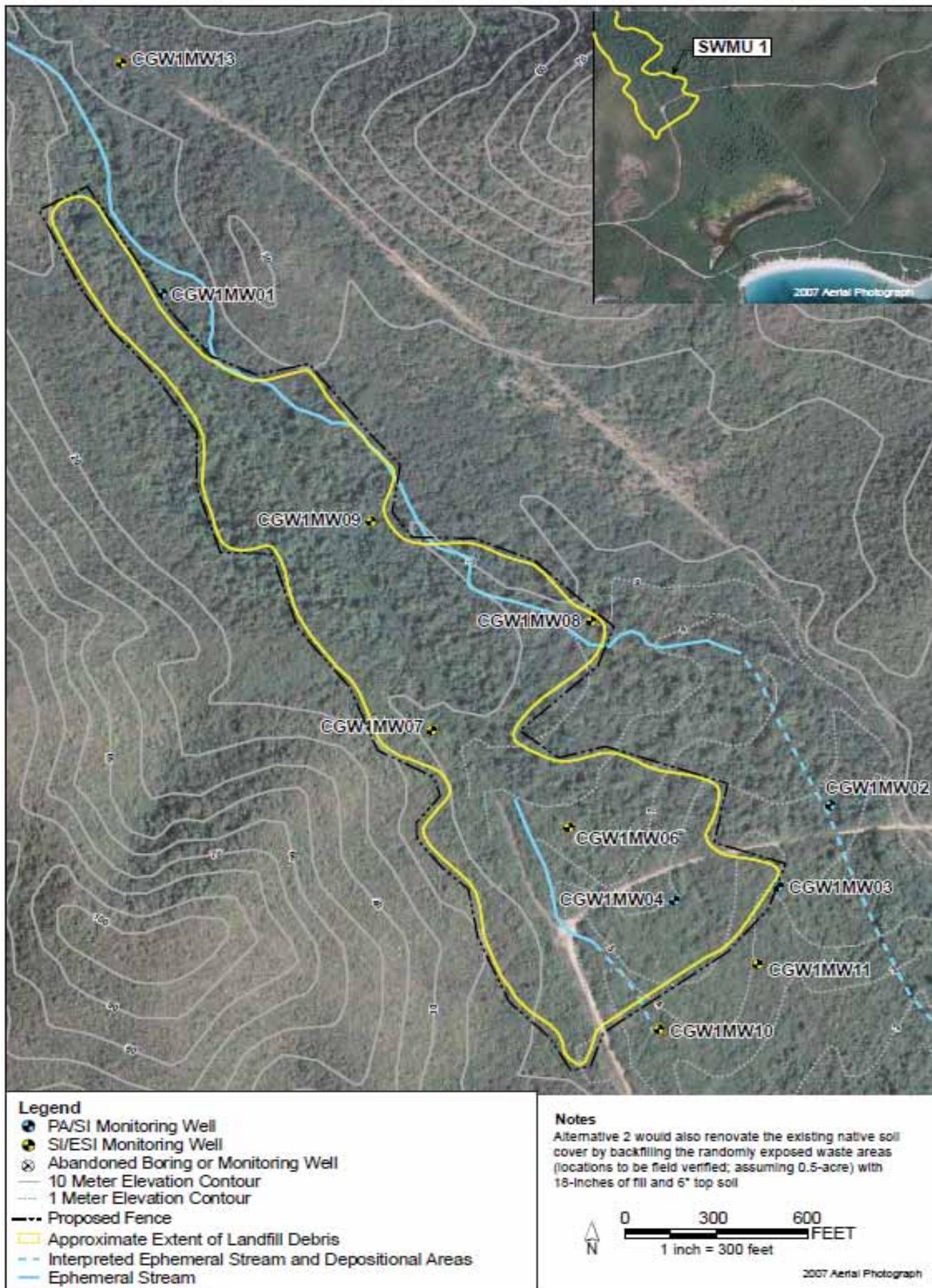


Figure 4 - Conceptual Layout of Alternative 2 - Enhanced Native Soil Cover and Institutional Controls

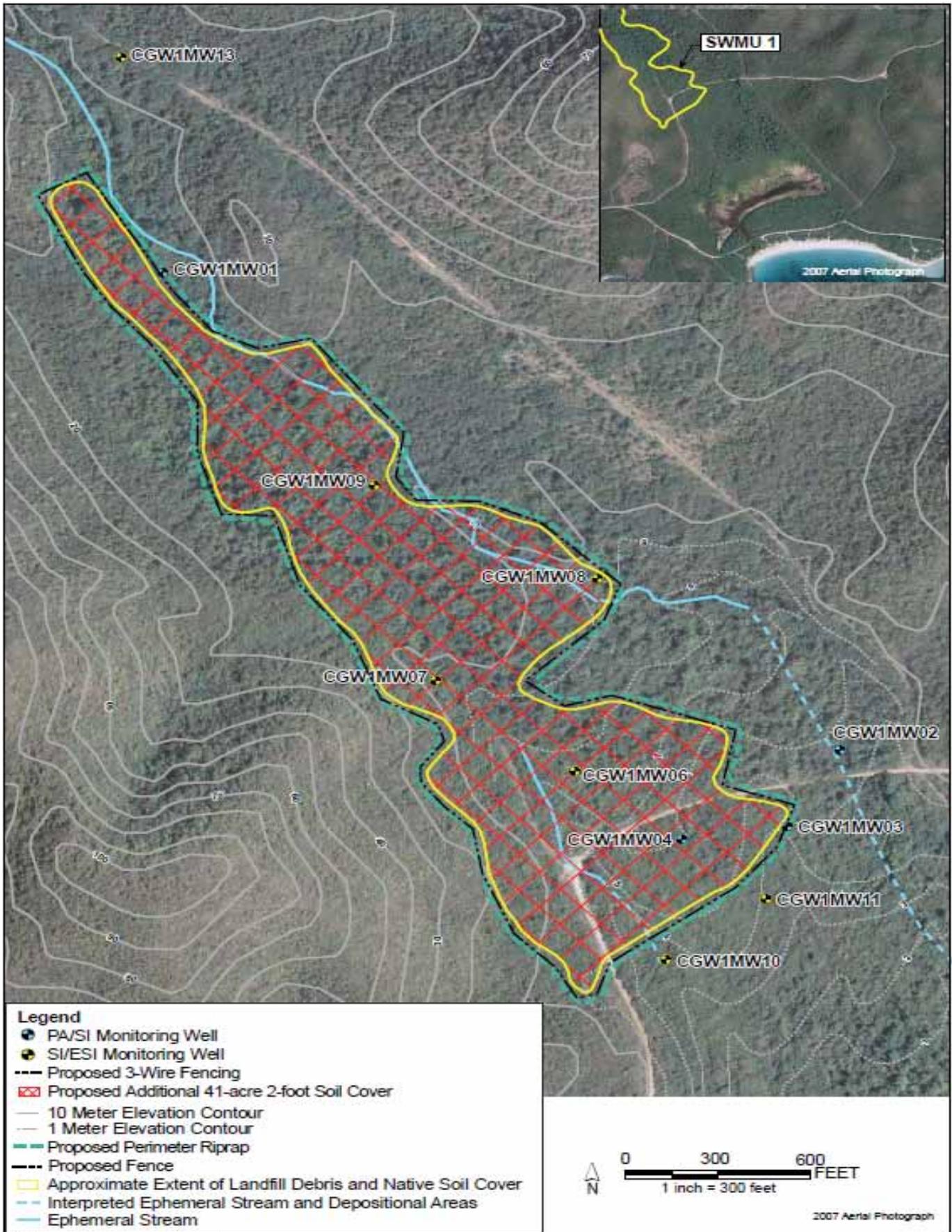


Figure 5 - Conceptual Layout of Alternative 3 - Additional Soil Cover and Institutional Controls

CERCLA Criteria	Definition
Threshold Criteria	
Protection of human health and the environment	Addresses whether a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through mitigation, engineering controls, or institutional controls.
Compliance with Applicable Relevant and Appropriate Requirements (ARARs) and “To-Be-Considered” criteria	Addresses whether a remedy will meet all of the ARARs of other Federal and Commonwealth/State environmental laws and/or justifies a waiver of the requirements.
Primary Balancing Criteria	
Long-term effectiveness and permanence	Addresses the expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once clean-up goals have been met.
Reduction in toxicity, mobility, or volume through treatment	Discusses the anticipated performance of the treatment technologies a remedy may employ.
Short-term effectiveness	Considers the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until clean-up goals are achieved.
Implementability	Evaluates the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement an option.
Present-worth cost	Compares the estimated initial, operations and maintenance, and present-worth costs.
Modifying Criteria	
Commonwealth/State acceptance	Considers the Commonwealth/State support agency comments on the Proposed Plan.
Community acceptance	Provides the public's general response to the alternatives described in the Proposed Plan, and RI/FS report. The specific responses to the public comments are addressed in the “Responsiveness Summary” section of the ROD.

Table 5 – Evaluation Criteria for Comparative Analysis of Alternatives

green house gases, waste minimization, and re-use and recycling of materials. Alternative 1 has the least short-term construction impacts and the lowest environmental footprint since there would be no remedial construction activities. The other alternatives would include construction activities with varying levels of potential impacts to construction workers, the community, and the environment. The amount of impact is proportional to the amount of vegetation clearance, back-fill and top soil, and truck traffic through the community. Alternative 2 has limited impacts to the landscape, because of the small area likely requiring soil cover. In fact, this alternative enhances areas where little or no soil is present over the landfill debris. Alternative 3 has significant impacts, including site clearing of existing vegetation over 41 acres and increased truck traffic through the community to transport vegetation and fill soil. Alternative 3 also has the highest green house gas emissions.

Implementability. Alternative 1 would not obtain administrative approval since it does not meet the RAOs. Alternative 3 would be the most complex alternative to implement because of much larger scale of construction, compared to Alternative 2. In terms of administrative feasibility, Alternative 3 would involve more erosion control permitting, since a 41-acre area would be disturbed.

Cost. Alternative 1 is the most cost effective, but does not meet the RAOs. Alternative 2 has a present-worth cost of \$1,258,000, which is substantially lower than Alternative 3, and still meets the RAOs. Alternative 3 is the least-cost

effective alternative, with an estimated **present-worth cost** of \$6,611,000.

Modifying Criteria

Commonwealth Acceptance. Commonwealth involvement has been continual throughout the CERCLA process for SWMU 1 and PREQB supports the preferred alternative. However, their final concurrence will be provided following the review of all comments received during the public comment period.

Community Acceptance. Community acceptance will be evaluated after the public comment period for the Proposed Plan, and substantive public comments will be addressed and documented in the forthcoming ROD for SWMU 1.

8 Preferred Alternative

The Navy and USEPA, in consultation with PREQB, agree that the preferred alternative for SWMU 1 is Alternative 2, Enhanced Native Soil Cover and Institutional Controls. Based on the evaluation of the data, information currently available, and the comparative analysis, the preferred alternative meets the statutory requirements of CERCLA for protection of human health and the environment under current and projected future land use as a wildlife refuge.

CERCLA Criteria	Remedial Alternatives		
	1. No Action	2. Enhanced Soil Cover	3. Additional Soil Cover
Threshold Criteria			
Overall Protection of Human Health and the Environment	0	4	4
Compliance with ARARs	0	4	4
Balancing Criteria			
Long-Term Effectiveness and Permanence	1	3	4
Reduction in Toxicity, Mobility or Volume through Treatment	0	0	0
Short-Term Effectiveness	4	3	1
Implementability	0	4	2
Present-Worth Cost	4 (\$95,000)	4 (\$1,258,000)	1 (\$6,611,000)
OVERALL RANK	9	22	16
Ranking: Scores range from 0 to 5, with 0 being the least favorable and 5 being the most favorable.			

Table 6 – Relative Ranking of Remedial Alternatives

9 Community Participation

A community relations program has been ongoing for the Vieques environmental restoration program since 2001. The community relations program fosters two-way communication of investigation and remediation activities between the stakeholder agencies (Navy, USEPA, PREQB, and USFWS) and the public. A RAB was formed in 2004 to provide for expanded community participation. Regular meetings are held to provide an information exchange among community members, stakeholder agencies, and the Municipality of Vieques. These meetings are open to the public and are held approximately every 3 months.

Public input is a key element in the decision-making process. Nearby residents and other interested parties are strongly encouraged to use the comment period to relay any questions and comments about the preferred alternative for SWMU 1. The Navy will summarize and respond to substantive comments in a Responsiveness Summary, which will become part of the official ROD for SWMU 1.

This Proposed Plan fulfills the public participation requirements of CERCLA Section 117(a), which specifies that the lead agency (the Navy) must publish a plan outlining any remedial alternatives evaluated for a site and identify the preferred alternative. All documentation pertaining to the investigation of SWMU 1 and the development of the preferred alternative presented in this Proposed Plan is available for public review in the Administrative Record at the Information Repository.

The public comment period for the Proposed Plan provides an opportunity for input regarding the remedy selection process for SWMU 1. The public comment period will be from August 1 to September 15, 2011, and a public meeting will be held on August 17, 2011 at 5:00 PM at the at Jorge's Ice House, located on Carr. 200 Km 3, hm 2, in

Barrio Martineau, Vieques, Puerto Rico. All interested parties are encouraged to attend the public meeting to learn more about the preferred alternative for SWMU 1. The meeting will provide an additional opportunity to submit comments on the Proposed Plan to the Navy.

Comments on the preferred alternative, or this Proposed Plan, must be postmarked no later than September 15, 2011. On the basis of comments or new information, the Navy and USEPA, in consultation with PREQB, may modify the preferred alternative or choose another alternative. The comment page included as part of this Proposed Plan may be used to provide comments to the Navy.

The Community Involvement Plan and technical reports supporting the preferred alternative for SWMU 1 are available to the public in the Information Repository, which is located at:

Biblioteca Electrónica

Benítez Guzmán Street, Corner with
Baldorioty de Castro Street
Isabel Segunda
Vieques, PR 00765
(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

Questions or comments can be submitted to any of the individuals listed in the box below during the public comment period.

Note: This summary is presented in English and Spanish for the convenience of the reader. Every effort has been made for the translations to be as accurate as reasonably possible. However, readers should be aware that the English version of the text is the official version.

**During the comment period,
interested parties may
submit written comments to
the following address:**

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Environmental Engineer
NAVFAC Atlantic
Code EV41

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Norfolk, VA 23508-1278

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Remedial Project Manager
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Wilmarie Rivera

Federal Facilities Coordinator
Puerto Rico Environmental Quality Board
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Urbanización San José Industrial Park

Avenida Ponce de León 1375

San Juan, PR 00929-2604

787-767-8181 x. 6129

wilmarierivera@jca.pr.gov

Alluvial Deposits: Sediment (including clay, silt, sand, or gravel) deposited by flowing water, as in a riverbed, flood plain, or ephemeral stream.

Applicable or Relevant and Appropriate Requirements (ARARs): CERCLA Section 121 (d)(2)(A) requires that remedial actions meet any federal standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate.

Background Concentration: Concentrations of naturally occurring and anthropogenic (due to mankind) constituents, such as inorganic constituents, found in groundwater, soil, sediment, and surface water at levels not influenced by site-specific releases. Background concentrations of some inorganics and other constituents are often at levels that may pose a risk to human health or the environment. However, background concentrations of site chemicals are factored into risk management determinations to ensure remedial actions are not implemented for constituents whose concentrations are attributable to background conditions and not indicative of a site-related release.

Cancer Risk: Cancer risks are expressed as a probability reflecting the increased chance that a person will develop cancer if exposed to chemicals or substances at a particular site and exposure scenario, as described in the Human Health Risk Assessment.

Chemical of Concern (COC): A contaminant that contributes risk or hazard above acceptable levels to a receptor.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA): A Federal law passed in 1980 (United States Code Title 42, Chapter 103), commonly referred to as the "Superfund" Program, that provides for cleanup and emergency response in connection with numerous existing, inactive hazardous substance disposal sites that endanger public health and safety or the environment. CERCLA was amended by the Superfund Amendments and Reauthorization Act (SARA) in 1986.

Ecological Risk Assessment (ERA): An evaluation of the risk posed to ecological receptors (i.e., plants and animals) if remedial activities are not performed at the site.

Excess Lifetime Cancer Risk: Potential carcinogenic effects that are characterized by estimating the probability of cancer incidence in a population of individuals for a specific lifetime from projected intakes (and exposures) and chemical-specific dose-response data.

Geophysical Survey: The use of one or more geophysical techniques (including electrical, gravity, magnetic, seismic, or thermal) to collect special data.

Groundwater: The supply of water beneath the Earth's surface that occurs in the pore spaces between soil grains or within fractures in geologic formations that are fully saturated.

10 Glossary

Acceptable Risk: USEPA's acceptable risk range for Superfund hazardous waste sites is 1×10^{-4} to 1×10^{-6} , meaning there is 1 additional chance in 10,000 (1×10^{-4}) to 1 additional chance in 1 million (1×10^{-6}) that a person will develop cancer if exposed to contaminants at a site that is not remediated.

Administrative Record: A compilation of documents and information for CERCLA sites that is made available to the public for review.

Human Health Risk Assessment (HHRA): A qualitative and quantitative evaluation of the risk posed to human health by the presence of specific pollutants. Elements include: identification of the hazardous substances present in the environmental media; assessment of exposure and exposure pathways; assessment of the toxicity of the site's hazardous substances; and characterization of human health risks.

Land Use Control (LUC): Physical, legal, or administrative methods that restrict the use of or limits access to property to reduce risks to human health and the environment.

Maximum Contaminant Level (MCL): The standard that is set by the United States Environmental Protection Agency for drinking water quality.

Media (singular, Medium): Soil, groundwater, surface water or sediment at the site

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): The Federal regulations (Code of Federal Regulations [CFR], Volume 40, Page 300 [40 CFR 300]) that guide determination of the sites to be corrected under both the Superfund (CERCLA) program and the program to prevent or control spills into surface waters or elsewhere.

National Priorities List (NPL): A list developed by USEPA of uncontrolled hazardous substance release sites in the United States that are considered priorities for long-term remedial evaluation and response.

Non-Cancer Risk: Non-cancer hazards (or risk) are expressed as a quotient that compares the potential exposure to contaminants at a particular site to the acceptable level of exposure. There is a level of exposure (the reference dose) below which it is unlikely for even a sensitive population to experience adverse health effects. USEPA's threshold level for non-cancer risk at Superfund sites is 1, meaning that if the exposure at a particular site exceeds the threshold, there may be a concern for potential non-cancer effects.

Preferred Alternative: With respect to the nine criteria specified in the NCP for evaluating remedial alternatives, the Preferred Alternative is the proposed remedy that meets the threshold criteria and is deemed to provide the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria.

Present-Worth Cost: Total present day cost to complete the proposed remedy.

Proposed Plan: A document that presents the preferred remedial alternative and requests public input regarding its proposed selection.

Public Comment Period: The time allowed for the members of a potentially affected community to express views and concerns regarding an action proposed to be taken at a site, such as a rulemaking, permit, or remedy selection.

Puerto Rico Environmental Quality Board (PREQB): The agency responsible for administration and enforcement of environmental regulations for Puerto Rico.

Receptors: Humans, animals, or plants that may be exposed to contaminants related to a given site.

Record of Decision (ROD): A legal document that describes the cleanup action or remedy selected for a site, the basis for choosing that remedy, and reflects the public comments that were considered regarding the selected remedy.

Remedial Action: A cleanup method or specified action to address contaminants at a site.

Remedial Investigation (RI): A study in support of the selection of a remedy at a site where hazardous substances have been released. The RI identifies the nature and extent of contamination and assesses human health and ecological risk associated with the contamination.

Regional Screening Level (RSL): Chemical-specific concentration goals for specific media (e.g. soil, sediment, water, and air) and land use combinations that serve as a target to use during the initial development, analysis, and selection of cleanup alternatives.

Saprolite: Decomposed and porous rock, often rich in clay, formed in place by chemical weathering of igneous, metamorphic, or sedimentary rocks.

To-be-considered (TBC) criteria: Non-promulgated regulatory criteria, advisories, guidance, and proposed standards that have been issued by the Federal or State government that are not legally binding and do not have the legal status of ARARs. However, TBC criteria may be useful for developing remedial alternatives and for determining the necessary level of cleanup for the protection of human health and the environment.

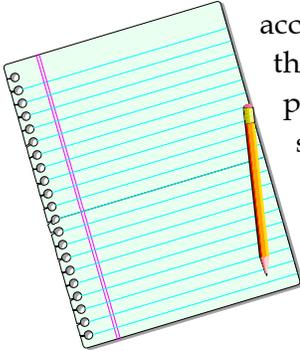
Unacceptable Risk: Risk that exceeds USEPA's acceptable risk range for Superfund hazardous waste sites of 1×10^{-4} to 1×10^{-6} .

United States Environmental Protection Agency (USEPA): The Federal agency responsible for administration and enforcement of CERCLA (and other Federal environmental statutes and regulations).

United States Fish and Wildlife Service (USFWS): The Federal agency responsible for the operation and management of the Department of Interior owned land.

Mark Your Calendar for the Public Comment Period

Public Comment Period
August 1 – September 15, 2011
Submit Written Comments



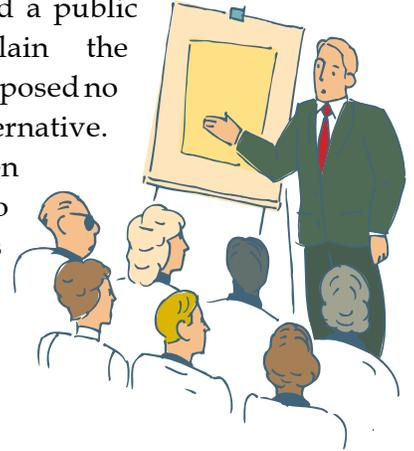
The Navy and USEPA will accept written comments on the Proposed Plan during the public comment period. To submit comments or obtain further information, please refer to the last page of this newsletter.

Attend the Public Meeting

Wednesday August 17, 2011 at 5:00 pm

**Jorge's Ice House
Carr. 200, Km 3, hm 2
Barrio Martineau, Vieques, PR**

The Navy will hold a public meeting to explain the rationale for the proposed no further action alternative. Verbal and written comments will also be accepted at this meeting.



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Place
stamp
here

NAVFAC Atlantic
Attention: Code EV41/Mr. Kevin Cloe
6506 Hampton Blvd.
Norfolk, VA 23508-1278