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Final
Magazine Siting Plan
for
Solid Waste Management Unit 4 (SWMU 4), SWMU 6, and Area of Concern J (AOC J)

Former U.S. Naval Ammunition Support Detachment
Vieques Island, Puerto Rico

Prepared for

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

Under the
LANTDIV CLEAN II Program
Contract No. N62470-95-D-6007
CTO-205

Prepared by

CH2MHILL

Tampa, Florida

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ARAR	Applicable, Relevant, or Appropriate Requirement
ASP	Ammunition Supply Point
ATF	Alcohol, Tobacco, and Firearms
BIP	Blow-in-Place
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-Term Environmental Action Navy
DOD	Department of Defense
DOI	Department of Interior
ECM	Earth Covered Magazine
ESL	Explosives Storage Location
ESQD	Explosive Storage Quantity Distance
EZ	Exclusion Zone
FOSET	Finding of Suitability for Early Transfer
HD	Hazard Division
HE	High Explosive
IBD	Inhabited Building Distance
LANTDIV	Atlantic Division
LPS	Lightning Protection System
mm	Millimeter
MPM	Most Probable Munitions
NASD	Naval Ammunition Support Detachment
NAVFACENGCOM	Naval Facilities Engineering Command
NEW	Net Explosives Weight
NFPA	National Fire Protection Association
NOSSA	Naval Ordnance Safety and Security Activity

OB/OD	Open Burn/Open Detonation
OE	Ordnance/Explosives
OESO	Ordnance Environment Support Office
PTR	Public Traffic Route
Q-D	Quantity-Distance
SMP	Site Management Plan
SUXOS	Senior UXO Supervisor
SWMU	Solid Waste Management Unit
USEPA	U.S. Environmental Protection Agency
UXO	Unexploded Ordnance
UXOSO	UXO Safety Officer

SECTION 1

Introduction

This Magazine Siting Plan presents the site-specific requirements for establishing a temporary portable explosives storage facility for use during implementation of the Phase I Ordnance and Explosives (OE) investigation at the former open burn/open detonation (OB/OD) site, the mangrove disposal site, and the construction staging and disposal area site at the former U.S. Naval Ammunition Support Detachment (NASD), Vieques Island, Puerto Rico. This Plan was prepared by CH2M HILL under Navy Contract N62470-95-D-6007, Navy Comprehensive Long-Term Environmental Action Navy (CLEAN), District III, Contract Task Order 205, and supplements the *OE Master Work Plan for the Former NASD* and the *OE Site-Specific Work Plan* prepared by CH2M HILL for the Naval Facilities Engineering Command (NAVFACENGCOM) Atlantic Division (LANTDIV) to meet the current Department of Defense (DoD) requirements for investigation of OE.

The three sites are also under investigation for hazardous constituents under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and has been designated by the U.S. Environmental Protection Agency (USEPA) as Solid Waste Management Unit-4 (SWMU 4), SWMU 6, and Area of Concern J (AOC J). The location of these three sites in relation to the Former NASD are presented in Figure 1-1.

1.1 SWMU 4 Description and Background

A detailed description of SWMU 4 (including its location and mission, structures and roads, vicinity characteristics, land use, and topography) is provided in Section 1.1 of the *OE Site Specific Work Plan for SWMU 4* (CH2M HILL, October 2001). Section 1.2 of the *OE Site-Specific Work Plan* provides a discussion on past and present site ownership, environmental history, and previous investigations conducted at SWMU 4.

SWMU 4 is situated within the approximate 3,100 acres retained by the U.S. Government as part of the Former NASD land transfer on April 30, 2001, as mandated by former President Clinton's directive of January 31, 2000. The 3,100 acres (consisting of the Conservation Zone at the Former NASD, referenced in section IV of the 1983 Memorandum of Understanding between the Municipality of Vieques and the Secretary of the Navy) were transferred to the Department of Interior (DOI) to be managed under a Cooperative Agreement between the Commomwealth of Puerto Rico, the Puerto Rico Conservation Trust, and the Secretary of the Interior.

Details of the land transfer are provided in the *Finding of Suitability for Early Transfer for U.S. Naval Ammunition Support Detachment, Vieques, Puerto Rico* (CH2M HILL, November 2000). Additional information related to the administration of this property is detailed in the *Site Management Plan for the Former NASD Facility, Vieques, Puerto Rico* (CH2M HILL, July 2001).

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Figure 1-1
Site Location Map For SWMU 4, SWMU 6, and AOC J
Former NASD, Vieques Island, Puerto Rico

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1.2 SWMU 6 Description and Background

The Mangrove Disposal Site (SWMU 6) is a 2.5 acre site located in an ocean-side mangrove swamp in Laguna Arenas along North Shore Road (Route 70) on the Former NASD. The Mangrove Disposal Site was in use during the 1960s and 1970s as a base disposal area although no disposal permits pertaining to this site were identified during records searches conducted in 1984 and 2000.

The observed waste materials extend northeast from the Laguna Kiani Bridge approximately 300 feet. The waste extends into the mangrove swamp for 100 to 120 feet in a northerly direction, and about 10 feet in a southerly direction from North Shore Road. Trash disposed of at this site included cans of lubricants and oil, solvents, paints, rubble, and scrap metal. The IAS team has estimated that approximately 800 cubic yards of material was disposed with most of this waste being scrap metal or solid waste.

The Expanded Phase I Preliminary Assessment/Site Investigation (PA/SI) for SWMU 6 was conducted in April and May 2000 and included geophysical surveys; UXO avoidance; installation and sampling of four monitoring wells; and collection of seven surface water/sediment samples, eight surface soil samples, and four subsurface (above the water table) soil samples. All samples were analyzed for metals, VOCs, SVOCs, pesticides, PCBs, and explosives.

A magnetometer survey was conducted to help delineate potential areas of buried metallic waste at SWMU 6. High concentrations of buried ferrous metal debris appear to be present in the northern portion of the site and under the road of the survey area. No ferrous debris appears to be present in the southern portion of the survey area. Because of the abundance of metal debris on the surface in some portions of the northern area, the survey was not able to determine whether buried ferrous metals are also present in these areas. Details of the magnetometer survey are included in Appendix G of the Phase I Expanded PA/SI (CH2M HILL, October 2000).

During the geophysical surveys, UXO technicians were contracted to perform UXO avoidance surveys. Fifteen concrete-filled practice bombs were found near the surface during the surveys by the UXO technicians. The UXO report is included in Appendix H of the Phase I Expanded PA/SI (CH2M HILL, October 2000).

1.3 AOC J Description and Background

The former staging and disposal site at AOC J encompasses an area of approximately 1.2 acres. The area was used as a solid waste disposal site associated with construction staging activities. It was used between the mid-1960s and 1973, after which the waste was removed from the site and placed in a municipal landfill off-base. No records were kept as to where the solid waste was taken. The types of waste taken from the site are unknown.

The area was used as a solid waste disposal site associated with construction staging activities. It was used between the mid-1960s and 1973, after which the waste was removed from the site and placed in a municipal landfill off-base.

During a site visit conducted by CH2M HILL at the site on September 14, 2000, 106 mm shell casings and 20 mm ammunition boxes were observed. Previous site walkovers by others (EBS, 2000) indicated visible debris consisting of scrap metal from construction equipment, unexploded ordnance (UXO), shell casings, glass fragments, and wood waste. Previous investigations at the site included collection of soil samples near the visible disposal areas. The samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. Analytical results of soil samples showed no elevated levels of any constituents of concern for this site.

1.4 Magazine Siting Plan Purpose and Objective

The purpose of this Siting Plan is to describe the general approach and methods, including operational and safety procedures, to be used by CH2M HILL and its subcontractors to perform OE activities at SWMU 4, SWMU 6, and AOC J including efforts associated with siting the temporary portable magazine. This Siting Plan also discusses the handling area for commercial explosives transported to Vieques and onsite transportation procedures for explosives.

Several OE/Unexploded Ordnance (UXO)-related safety regulations are cited in this Plan as they apply to the portable magazine siting efforts at the three sites. Applicable, relevant, or appropriate regulations (ARARs) that may be considered during implementation of the Magazine Siting Plan are listed in Table 1-1 of the *OE Master Work Plan for the Former NASD*.

SECTION 2

Explosives Siting Plan

This section presents the site-specific explosives siting plan requirements to be followed for the storage of explosives during OE work at SWMU 4, SWMU 6, and AOC J. Safety criteria for planning and siting explosives operations were developed in accordance with NAVSEA OP 5 VOL I, OPNAVINST 8020.14, and NAVFACINST 11010.44. Detailed descriptions on the determination of exclusion zones (EZs), minimum separation distances, and the establishment of demolition areas are presented in this section, along with details on the explosives storage magazine, explosives handling area, and onsite transportation issues.

2.1 Ordnance and Explosives Areas

During certain activities in OE areas, including siting of the portable explosives magazine, an EZ with a minimum separation distance will be established to protect the public in the event of both intentional and unintentional detonations. The EZ will establish an area in which only personnel essential to the project will be permitted. Essential personnel are generally considered to be UXO-qualified personnel, but could include other personnel such as heavy equipment operators and geophysical equipment operators if their presence is essential to the task.

Minimum separation distances for non-detonation activities and for intentional detonation activities are discussed below. Table 2-1 summarizes basic activities that will be conducted in OE areas and the basis for determining the appropriate EZ minimum separation distance.

TABLE 2-1
Determining Size of Exclusion Zone

Operation	Basis for Determining Size of Exclusion Zone	Minimum Separation Distance (For Non-Essential Personnel)	Safe Separation Distance (For Other UXO Teams)
Anomaly Avoidance	Unintentional Detonation with low probability because exposure to potential UXO is specifically avoided	Generally requires no EZ, but a 200 ft distance is recommended	Generally requires no EZ, but a 200 ft distance is recommended
Non-Intrusive Site Work such as Vegetation Removal, Geophysical Surveying, Mag & Flag Sweeps	Unintentional Detonation with low probability because no intrusive activities are performed	Generally requires no EZ, but a 200 ft distance is recommended	Generally requires no EZ, but a 200 ft distance is recommended
Anomaly Excavation during OE Removal or Construction Support	Unintentional Detonation	Maximum Fragment Distance of MPM (see Table 2-2)	200 ft

TABLE 2-1
Determining Size of Exclusion Zone

Operation	Basis for Determining Size of Exclusion Zone	Minimum Separation Distance (For Non-Essential Personnel)	Safe Separation Distance (For Other UXO Teams)
Disposal Operations:	Intentional Detonation		
Non-Fragmenting Ordnance		Greatest of: 328 x (NEW) $^{1/3}$ or debris throw range if known (1,250 ft default) or 200 ft	
< 5" Caliber Fragmenting Ordnance		Greatest of: 328 x (NEW) $^{1/3}$ or Maximum Fragment Distance (2,500 ft default) or 200 ft	
≥ 5" Caliber Fragmenting Ordnance		Greatest of: 328 x (NEW) $^{1/3}$ or Maximum Fragment Distance (4,000 ft default) or 200 ft	

2.1.1 Minimum Separation Distances for Non-Detonation Activities

Certain activities in OE areas will require EZs even though no explosive detonation is planned. For example, unintentional detonation of UXO could potentially occur while excavating geophysical anomalies in OE-related project areas. Although this may be unlikely because of the use of safety procedures, the EZ is required as a precaution to protect nonessential personnel. The same scenario applies to the siting and construction of the portable explosives magazine. Minimum separation distances for nonessential personnel during OE operations at an OE site shall be determined using the following criteria per NAVSEA OP 5 Vol. I, OPNAVINST 8020.14, and DoD 6055.9 STD:

- If the type of OE is unknown, the distances in Chapter 5, paragraph C5.5.4, DoD 6055.9 STD will apply.
- If a most probable munitions (MPM) has been established, the maximum fragmentation distance for the MPM, as calculated by Naval Ordnance Safety and Security Activity (NOSSA)/Ordnance Environment Support Office (OESO), will apply.
- When conditions and OE hazards permit, the minimum separation distance may be reduced to fit the situation, but in no case shall the distance be less than greatest of the following:
  - A distance at which the hazardous fragment density is less than 1 hazardous fragment per 600 sq ft
  - A safe separation distance of 200 ft
  - The K50 based on over pressure

Reduction of the minimum separation distance as described here will require approval from NOSSA/OESO.

The MPM is determined by calculating fragmentation and blast overpressure distances for the expected type(s) of OE based on historical research or data generated from surface or intrusive sampling. The MPM is the munition that is likely to be encountered and has the largest fragmentation or blast overpressure distance. The MPM for the Former NASD will

vary depending on the OE area, and will be specified in site-specific Work Plans. Table 2-2 presents examples of fragmentation and overpressure distances for various munitions.

TABLE 2-2
Calculated Fragment and Overpressure Distances Examples

Munition[a]	Hazardous Fragment Distance[b] (ft)	Maximum Fragment Distance[c] (ft)	K50 Over Pressure Distance[d] (ft)
37 mm MK II	200	1,181	43
2.36" Rocket (case only)	200	809	43
60 mm M49A3	200	1,080	41
81 mm M374	234	1,233	70
105 mm M1	341	1,939	70
3" Stokes Mortar	219	1,346	68

[a]For quantity-distance (Q-D) siting purposes, two separate MPMs and resulting EZ distances will be established for NASD Vieques, based on the greatest of the fragmentation or overpressure distances for the types of munitions found during sampling. Fragment hazard distances will be recalculated based on the NEW, in the event different OE items are found.
[b]As calculated by NOSSA/OESO, the distance at which fragments do not exceed a hazardous fragment density of one hazardous fragment per 600 sq ft, where a hazardous fragment is defined as a fragment having an impact energy of 58 ft-lb or greater.
[c]As calculated by NOSSA/OESO, the maximum distance at which a fragment of the munition may travel based on munition design specifications and maximum trajectories.
[d]As calculated by NOSSA/OESO, distance at which blast overpressure exposure from Hazard Division 1.1 explosives is less than 0.90 psi—the lower end of the permissible exposure level for inhabited buildings, administrative and housing areas per Chapter 2, para. D.6 of DoD 6055.9-STD. Determined from the formula: $50 \times NEW^{1/3}$.

2.1.2 Planned or Established Demolition Areas

A planned or established demolition area is an area that is used repeatedly to destroy OE during the removal project. No OB/OD areas are currently active at the Former NASD. When UXO is found, it will be disposed in place by explosive detonation. In the event that the item is unfuzed and safe to move, and there is a concern of damaging nearby buildings or other property, the item may be moved a sufficient distance to a nearby area for demolition.

In accordance with Chapter 5, paragraph C5.5.4.1.2, DoD 6055.9-STD, the EZ minimum separation distance for all personnel during intentional disposal detonations will be the greater of the overpressure distance or the maximum fragment throw range, determined as follows:

- Overpressure – The overpressure distance will be calculated based on the K328 formula[1]:

$$\text{Distance (ft)} = 328 \times NEW^{1/3}$$

Where:

The Net Explosives Weight in Pounds (NEW) is the actual weight of explosive mixture or compound including the TNT equivalent or other energetic material which is used in the determination of explosive limits and explosive storage quantity distance (ESQD) arcs.

[1]Chapter 5, paragraph C5.5.4.1 of DoD 6055.9-STD specifies the minimum separation distance in feet between explosive demolition ranges and non-essential personnel is $328 \times NEW^{1/3}$. The term K328 is often used to represent this distance.

- Fragmentation – If engineering controls are used to mitigate fragmentation, the fragmentation distance can be reduced accordingly, but will never be below 200 ft per NAVSEA OP 5 Vol. I. For unmitigated detonations, the maximum fragmentation distance shown in Table 2-2 will be used. If the munition is not shown on this table, a default of 2,500 ft (caliber less than 5 inches) or 4,000 ft (caliber greater than or equal to 5 inches) should be used per Chapter 5, paragraph C5.5.4.1.2, DoD 6055.9-STD.

2.2 Footprint Areas

2.2.1 Blow-in-Place (BIP)

BIP occurs when an OE item is deemed unsafe to move. In this case, the item is prepared and detonated in-place. Minimum separation distances for BIP are based on the criteria for planned or established demolition areas, as discussed in Section 2.1.2.

2.2.2 Collection Points

Collection points are areas within a search grid where recovered OE that is safe to move is temporarily accumulated pending transport to another area for storage or destruction. EZs for collection points are based on the criteria for unintentional detonations as discussed in Section 4.1.1 of the *OE Master Work Plan*, using the MPM for the area. For SWMU 4, SWMU 6, and AOC J it is anticipated that the majority of ordnance found will be 20 mm high-explosive (HE) projectiles.

As these projectiles are identified and deemed safe to move, they will be moved to an accumulation area consisting of a sandbagged area covered by plywood. It is anticipated that an area previously used for storage of items found during the Green Beach UXO clearance project will be utilized for the temporary storage of safe-to-move items such as the 20 mm HE projectiles. This accumulation area is within the limits of the three sites and is protected by two fenced-in areas with locks.

It is anticipated that accumulated safe to move ordnance will be BIP once weekly depending on the amount of items recovered.

2.2.3 In-Grid Consolidated Shots

The minimum separation distance for all personnel during consolidated shots will be based on the criteria for intentional detonations as stated in Section 2.1.2. When calculating the overpressure distance, the NEW of all munitions plus the initiating explosives must be calculated.

Two situations may describe the consolidated shot process:

1) Munitions may be collected from anywhere on site and detonated at a designated, sited disposal area

2) Munitions may be collected within a grid and detonated at a designated spot within the grid

Since no designated disposal area exists, only the latter is expected. In either situation, the same procedures must be followed. Munitions will be placed with their sides touching such

that their axes are horizontal. The munitions will be placed so that the nose of each munition is pointing in the same direction. Munitions will be oriented so that lugs and/or strong-backs, and nose and/or tail plate sections are facing away from personnel locations. The consolidated shot shall be initiated in such a manner that detonation of all munitions is simultaneous.

2.3 Explosives Storage Magazines

A portable explosives storage Type 2 magazine will be located on the concrete apron of the existing earth covered magazine (ECM) 239 near SWMU 4. Figure 2-1 shows the location of ECM 239. Explosives items will be stored in accordance with its Hazard Division (HD) and the storage compatibility group criteria listed in Chapter 3 of DoD 6055.9-STD. The types of explosives to be used for demolition of UXO, approximate on-hand quantities, NEW, HD, and storage compatibility groups, are shown in Table 2-3.

TABLE 2-3
Anticipated Quantities of Explosives Stored

Explosive	Quantity	Total NEW	Hazard Division	Storage Compatibility Group
		Magazine 1		
50 grain/foot Detonating Cord	500 ft	2.7 pounds	1.1	D
Jet Perforators	80	6.6 pounds	1.4	D
KINEPAK Binary Explosives	32	40 pounds	NA	NA
		Magazine 2		
NONEL	2,000 ft	Less than 3 pounds	1.4	B
Caps, blasting electric	60	Less than 3 pounds	1.4	B

In the event that ECM 239 is unavailable for whatever reason, CH2M HILL will establish a temporary Explosives Storage Location (ESL) at the ammunition supply point (ASP) or an alternate location to be designated.

2.3.1 Magazine Type

The safety arcs for the existing ECMs at the Former NASD have been removed and the magazines have been closed out as part of the transfer of the Former NASD. With the availability of ECMs limited, explosives will be stored in a temporary Type 2 magazine provided by USA Environmental as described in Section 55.208(a)(4) of Alcohol, Tobacco, and Firearms (ATF) P 5400.7, Explosives Law and Regulations. This temporary portable unit is constructed with two separate compartments for initiators (blasting caps) and binary explosives.

The Q-D requirements for the temporary portable magazine are presented in Section 2.3.2.

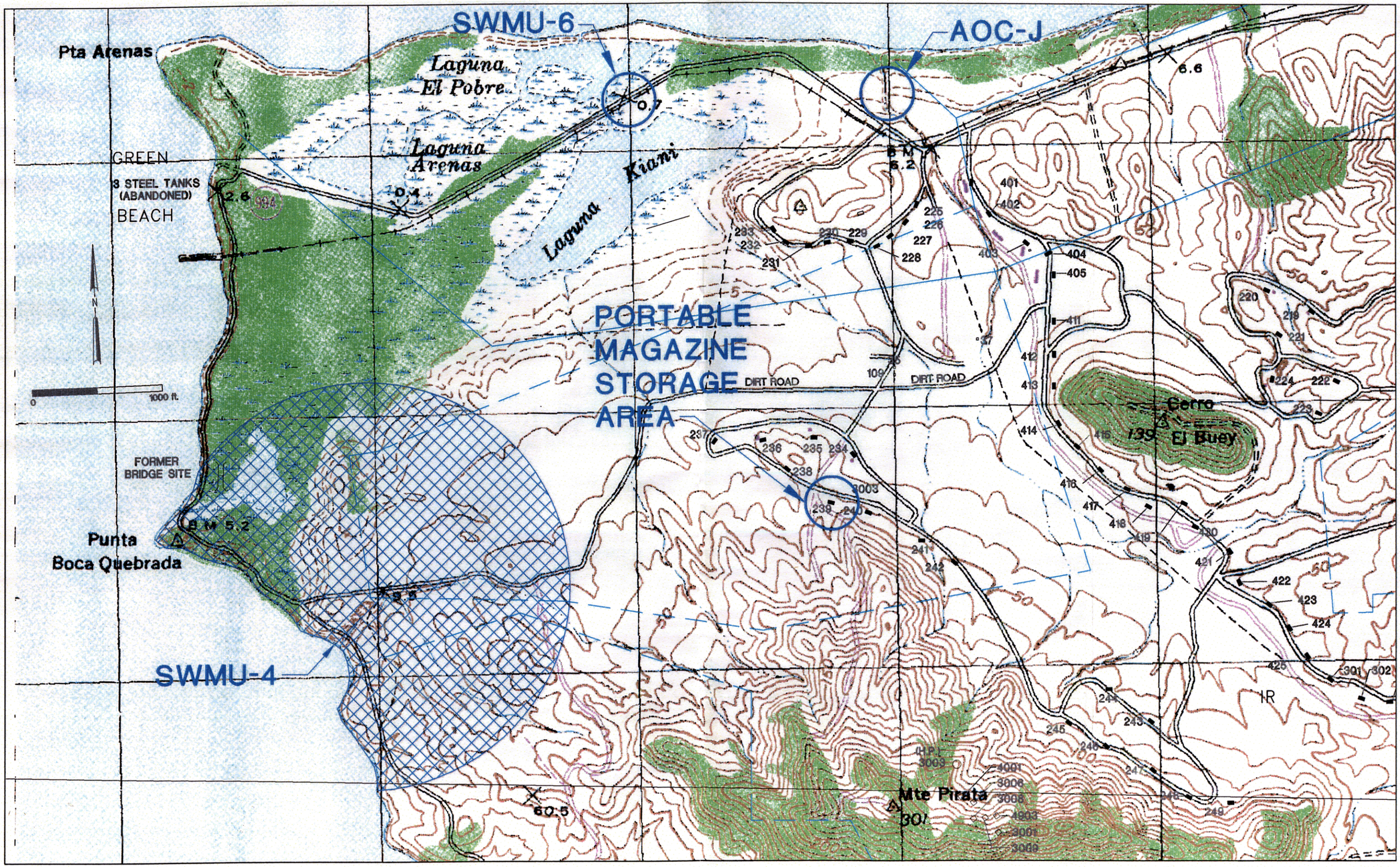

Figure 2-1
LOCATION OF EARTH COVERED MAGAZINE 239
Former NASD, Vieques Island, Puerto Rico

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The portable explosives storage magazine will be placed on the concrete apron to the existing ECM 239 near SWMU 4. Three sides of ECM 239 will provide security for the portable magazine. A fence will be constructed on the fourth side to enclose the portable magazine and will be completed with a fence, gate and double lock.

The maximum NEW to be stored in each compartment of the magazine is 50 pounds. This explosives storage area will meet the requirements of:

- ATF P 5400.7 - Alcohol, Tobacco, and Firearms (ATF) Explosives Laws and Regulations
- DoD 6055.9-STD - DoD Ammunition and Explosives Safety Standards
- DA Pam 385-64 - Ammunition and Explosives Safety Standards
- NAVSEA OP 5 Volume 1, Ammunition and Explosives Ashore

2.3.2 Quantity-Distance

The applicable Q-D criteria for siting explosives magazines at the Former NASD are specified in Chapter 9, Table 9-1, DoD 6055.9-STD. The location of the temporary portable explosives storage magazines at ECM 239 is shown in Figure 2-2 with Inhabited Building Distance (IBD) and public traffic route (PTR) distances illustrated, assuming total NEW of less than 50 pounds. For HD 1.1 explosives with a NEW of 1 to 50 pounds, the IBD is 601 ft, and the PTR distance is 60 percent of the IBD, or 361 ft. These distances are applicable for either earth-covered or aboveground magazines. The two safety arcs are illustrated in Figure 2-2.

If UXO is discovered and cannot be disposed of on the day it is found, security measures will be implemented until disposal has been accomplished. If this occurs, all OE/UXO that can be moved or staged for future disposal will be held in existing military magazines on approved portable magazines as described in Chapter 14, DoD 6055.9-STD, "Storage Procedures for Waste Military Munitions."

2.3.3 Physical Security

The concrete apron adjacent to ECM 239 to be used for the storage of the portable magazine will be completed with a new chain-link fence, gate, and two separate locks that meet the standards for ATF Type 2 magazines, as specified in Section 55.208(a)(4), ATF P 5400.7. A photo illustrating the concrete option at ECM 239 is provided as Figure 2-3. The senior UXO supervisor (SUXOS) will hold a key to one of the locks, and the UXO safety officer (UXOSO) will hold the key to the other. Access to the explosives will require both individuals. CH2M HILL will maintain control of all keys.

2.3.4 Placards

Each of the two compartments of the portable magazine will display the placards required by OP 5, for the appropriate hazard division and class. A hazard identification for fire fighting personnel will also be displayed at the magazine storage area. Signs stating "EXPLOSIVES" and "NO SMOKING" will be posted on the fence surrounding the magazines.

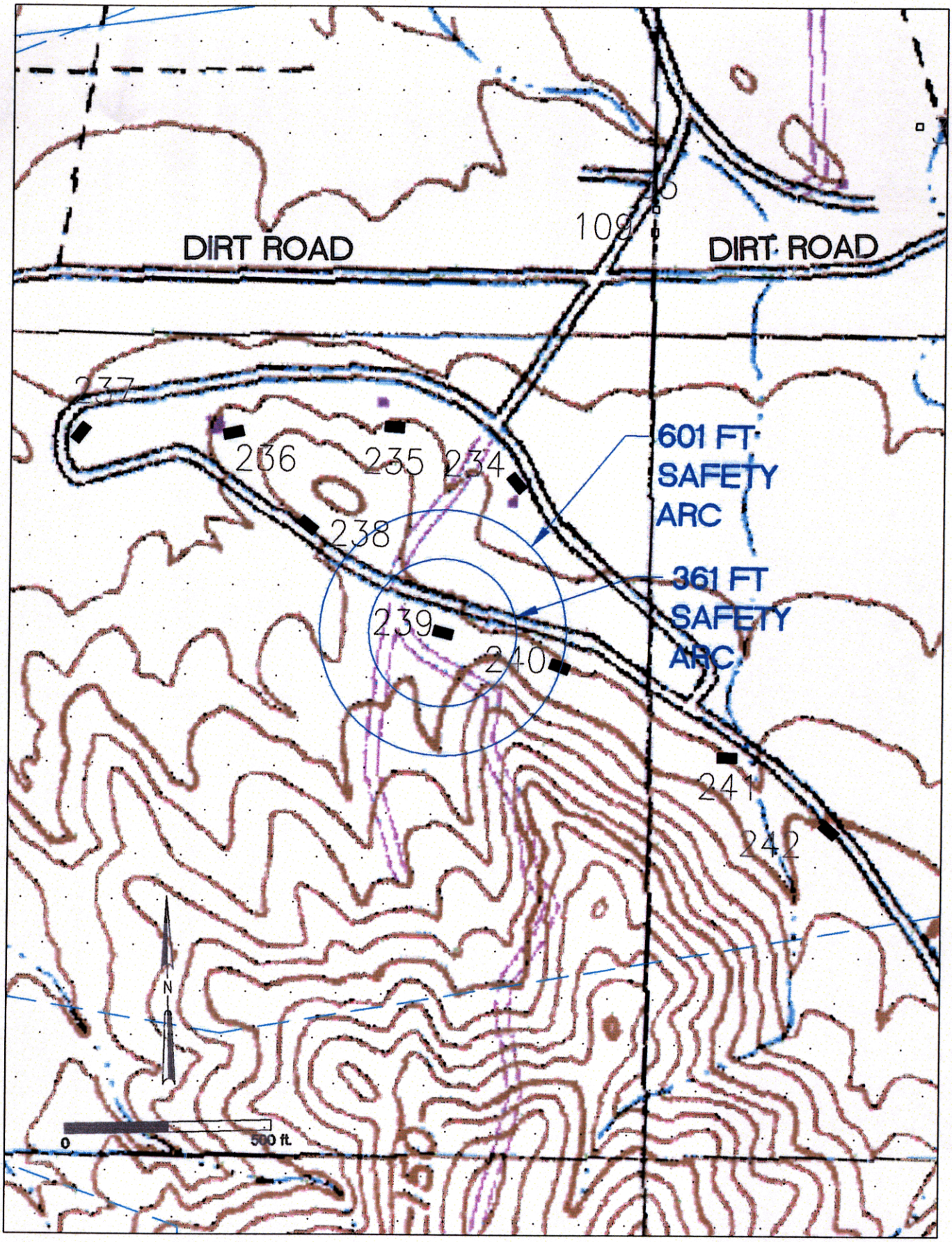

Figure 2-2
LOCATION MAP ILLUSTRATING SAFETY ARCS AROUND ECM 239
Former NASD, Vieques Island, Puerto Rico

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FIGURE 2-3
Photo illustrating concrete apron at Earth Covered Magazine 239

2.3.5 Lightning Protection System

Because the three sites at the Former NASD are located on U.S. Government property, the requirements of Chapter 7 of DoD 6055.9-STD apply. These requirements specify a lightning protection system (LPS) for the explosives magazines. The LPS will be designed to intercept lightning at a 100-foot or less striking distance arc in accordance with National Fire Protection Association (NFPA) 780. The LPS will be inspected, repaired as necessary, and tested prior to receiving the first shipment of explosives. It is expected that existing grounding units at ECM 239 will be utilized to ground the portable magazines proposed for storage outside of the ECM.

2.3.6 Fire Protection

Fire extinguishers of 10-pound capacity and type BC will be located in the magazine area. Type BC fire extinguishers are intended for use for electrical or fuel fires. Smoking, matches, open flames, spark-producing devices, and firearms will not be permitted within 50 ft of the magazines. The land surrounding the magazines will be kept clear of all combustible materials for a distance of at least 50 ft.

2.3.7 Stocking Procedures

Containers of explosive materials are to be stored so that marks are visible. Stocks of explosive materials are to be stored so that they can easily be counted and checked upon inspection. Except with respect to fiberboard or other non-metal containers, containers of explosive materials are not to be unpacked or repacked inside a magazine or within 50 ft of a magazine, and must not be unpacked or repacked close to other explosive materials. Containers of explosive materials must be closed while being stored.

Tools used for opening and closing containers of explosive materials are to be constructed of non-sparking materials, except that metal slitters may be used for opening fiberboard containers. A wood wedge and a fiber, rubber, or wooden mallet are to be used for opening and closing wood containers of explosive materials. Metal tools other than non-sparking transfer conveyors are not to be stored in any magazine containing high explosives.

2.4 Transportation

2.4.1 Onsite Transportation Procedures

Commercial explosives may be delivered to the island via the airfield or by vessel to the pier. The quantity of explosive material and distance separations (Q-D) that provide defined types of protection are tabulated in the appropriate Q-D tables provided in DoD 6055.9-STD. Q-D submissions will be addressed in the Explosive Safety Submission.

Explosives will then be delivered to the temporary portable magazines either by a military explosives carrier or a licensed and permitted commercial explosives transporter in accordance with NAVSEA OP 2239. When explosives are required at the work site, CH2M HILL will transport the explosives in an vehicle marked with appropriate placards, following the procedures stated in this section.

Recovered UXO will not be moved unless it is safe to do so. Movement of UXO should only be performed when a UXO Technician III/Team Leader can make a positive identification that the munition is unfuzed and safe to move, and can have this verified by at least one other UXO Technician III/Team Leader prior to movement. The UXOSO may require additional measures and inspection before movement and preparation for transportation. Procedures for transporting explosives from the storage facility to the demolition site include:

- The driver of any explosive-laden vehicle will ensure that the load is properly braced and that the initiators are carried separately from main charge explosives.
- The UXO supervisor in charge of the explosives movement will ensure that the driver and any passengers are not carrying any smoking products or flame-producing devices. Smoking by all personnel involved in the handling or transportation of explosives is strictly forbidden.
- Drivers transporting explosives on roads that are not controlled by the U.S. Government must possess a valid commercial driver's license with a hazardous materials endorsement.
- The amount of explosives issued and transported will be limited to the amount needed to perform the day's demolition operations and any quantity limitations imposed by transportation regulations.
- WP munitions will not be transported unless they are immersed in water, mud, or wet sand.
- If loose pyrotechnic, tracer, flare, and similar mixtures are to be transported, they shall be placed in #10 mineral oil or equivalent to minimize fire and explosion hazards.
- If an unfired rocket motor must be transported, it shall be positioned in such a manner as to offer the maximum protection to personnel in the event of an accident.
- All motor vehicle transportation of explosive materials will be in accordance with the provisions of Title 49 of the Code of Federal Regulations (CFR), Parts 173. Transportation of donor demolition explosive material and recovered OE/UXO will not be permitted in the same explosive transportation vehicle.
- If a UXO with exposed hazardous filler (HE, etc.) has to be moved to a disposal area, the item shall be placed in an appropriate container with packing materials to prevent migration of the hazardous filler. Padding should also be added to protect the exposed filler from heat, shock, and friction.

2.4.2 Vehicle Requirements

Vehicles transporting explosives on the project site will comply with the following requirements:

- Vehicles transporting explosives will be marked with appropriate placards when carrying all Class 1 explosives.

- All vehicles transporting explosives will be equipped with reliable communications, a first aid kit, and two 10-pound type BC fire extinguishers.
- Vehicles transporting explosives will be inspected daily when in use and the inspections will be documented in a Motor Vehicle Inspection Form (refer to Form 3-1 as an attachment to the *OE Master Work Plan*).
- The vehicle used to transport the explosives will have a non-sparking bed liner, and all explosive loads will be covered prior to departure.

2.4.3 Explosives Handling Area

A submittal for the site explosives handling area is not required because the commercial explosives to be used during OE work at SWMU 4, SWMU 6, and AOC J will be shipped to Vieques via Federal Express.

SECTION 3

References

CH2M HILL, Inc. *Draft Final OE Master Work Plan for the Former Naval Ammunition Support Detachment, Vieques, Puerto Rico.* October 2001.

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