



## Environmental Ordnance and Explosives

### Client

US Department of the Navy

### Location

Vieques Island, Puerto Rico

## Ordnance and Explosives (OE) Investigation SWMU 4 Open Burn/Open Detonation (OB/OD)

### Key Tasks

- Vegetation removal in a national wildlife refuge
- Digital geophysical mapping
- Anomaly verification and identification by OE Specialists
- Removal and disposal of OE/UXO and scrap metal

### Project Overview

In response to a directive by the President of the United States, the Department of the Navy transferred 3,100 acres of property on Vieques Island, Puerto Rico to the Department of Interior (DOI) to be developed as a national wildlife refuge. CH2M HILL was contracted by the Department of the Navy to perform an OE/UXO investigation at an OB/OD site located within the wildlife refuge. A preliminary assessment/site investigation (PA/SI) identified 61 OE items ranging from 20 millimeter (mm) projectiles to 60 mm fuses as far as 1,500 feet from the suspected location of the OB/OD site. To secure the area, site access was restricted by installing over 5 miles of fence around the perimeter.

Based on the results of the first phase PA/SI, additional investigation was performed to confirm the existence and type of OE at the site. The primary objectives of the investigation were to locate the former OB/OD pits, develop a conceptual site model, plot the probable extent of the “kick out” area, and develop an environmental sampling plan.

A digital geophysical mapping survey was conducted over a 35-acre area using an EM-61 instrument. The area was cleared with a track-mounted brush cutter customized for OE work. Clearing was coordinated with DOI to minimize damaging endangered plants within the wildlife refuge. Metallic anomalies were verified by qualified UXO technicians by excavating to a 1-foot depth. The verification data were digitally recorded for entry into a GIS database and used to develop maps of OE findings. OE scrap was certified and disposed of properly.

Based on the results of the investigation, over 700 OE items were removed to minimize the safety risk to future public access to the wildlife refuge.

The technical plan relied upon a systems approach for the following tasks:

- Geophysical prove-out
- OE/UXO clearance
- Vegetation clearance
- Digital geophysical mapping
- Anomaly analysis, verification

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- Removal and disposal of OE

### **Significant Accomplishments**

- Land use controls for public safety – installed 5 miles of fence
- Community relations included fact sheets and public meetings which resulting in positive press for client in Puerto Rico
- Digital geophysical mapping techniques to locate subsurface anomalies – 35 acres surveyed
- Findings from 4,000 metallic anomalies identified 705 OE items
- Project coordinated with four federal agencies (Navy, EPA, DOI, BATF), two state agencies (PREQB, Commissioner of Vieques), and Municipality of Vieques