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FOSTER WHEELER ENVIRONMENTAL CORPORATION

March 9, 1999
File #: 1284-0035-99-0087

Commanding Officer
Northern Division
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop No. 82
Lester, Pennsylvania 19113
Attn: Code 402A (Ms. Christi M. Davis)

SUBJECT: U.S. NAVY CONTRACT NUMBER IN 62472-94-D-0398
DELIVERY ORDER NO. 0035 - NOMANS LAND ISLAND
UNEXPLODED ORDNANCE REMOVAL
PROJECT COMPLETION LETTER

Dear Ms. Davis:

The purpose of this letter is to document the remedial response actions performed by Foster Wheeler Environmental Corporation (Foster Wheeler) on Nomans Land Island, Massachusetts between 1 March 1998 and 15 September 1998. The objectives of this work were to:

- Remove practice bombs and other unexploded ordnance from the surface of Nomans Land Island;
- Remove other target materials;
- Remove underground storage tanks and any contamination associated with the tanks;
- Perform a Phase I Limited Site Investigation of the former Navy activities on Nomans Land Island; and
- Remove dangerous structures remaining from earlier Navy activities.

Figure 1 shows the location of Nomans Land Island. Figure 2 is a map of Nomans Land Island.

UXO REMOVAL

Objective. The primary objective of this project was to locate, examine, process and remove ordnance items on or near the ground surface. The purpose of this action was to reduce the risk to US Fish and Wildlife Service personnel working on the island and to trespassers. Specific objectives of the project were to:

- Remove ordnance debris in accordance with a Department of Defense Explosive Safety Board (DDESB) approved ordnance remediation plan. Ordnance debris was to be located, inspected and certified to be at a "5X" level of contamination (no significant amounts of visible explosive remain, i.e., not enough to present an explosive hazard).
- Perform controlled burning of dried vegetation in accordance with an approved burn prescription.

2300 LINCOLN HIGHWAY EAST, 1 OXFORD VALLEY, STE. 200, LANGHORNE, PA 19047
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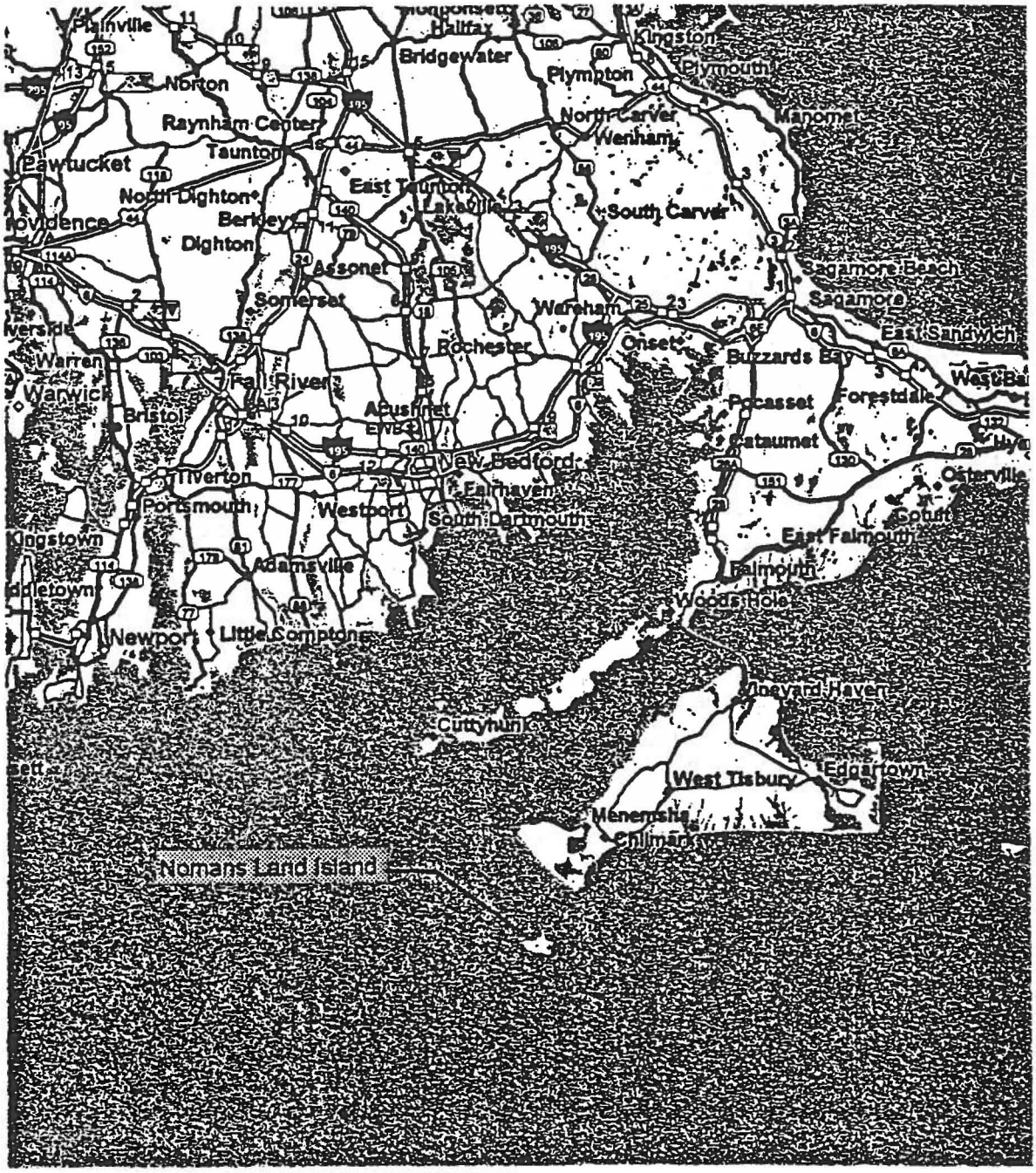

Figure 1. Location of Nomans Land Island.

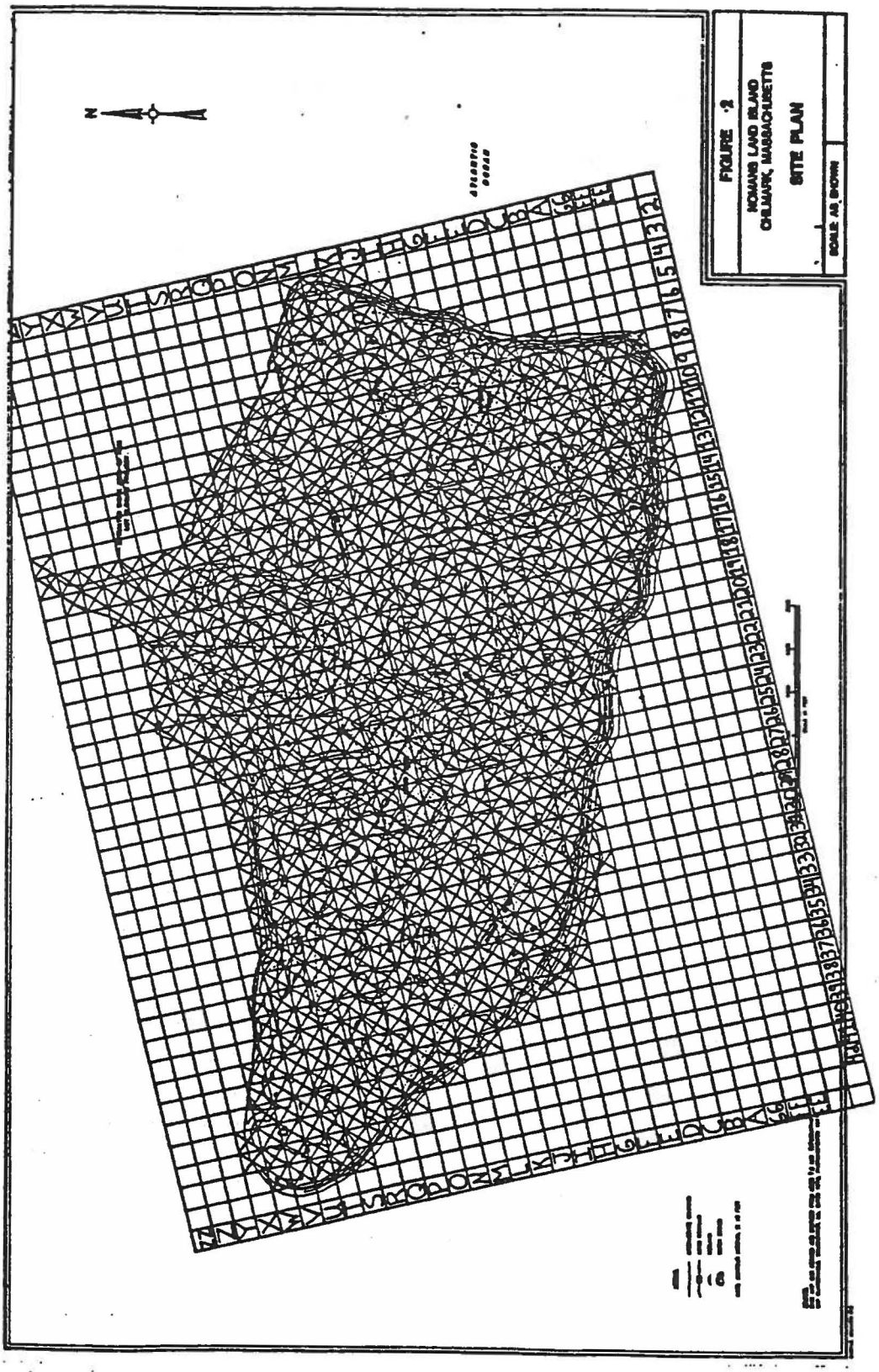
FIGURE -2
NOMANS LAND ISLAND
DUKEMIRE, MASSACHUSETTS
SITE PLAN
SCALE AS SHOWN
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- Perform surface clearance by teams of trained workers led by qualified UXO Specialists. Ordnance items and residual target materials were to be detected by visual means, supplemented by hand-held magnetometers.
- Render inert all ordnance items that were not certifiable as inert by a qualified UXO Specialist following accepted procedures.
- Remove all ferrous metal items with a maximum dimension greater than 2 inches and all visually detected nonferrous ordnance components.
- Consolidate all ordnance related materials for later pickup.
- Remove, transport to the mainland, and properly dispose of all ordnance related materials and target marking items.

Preparations. A controlled burn of vegetation was conducted in accordance with an approved burn prescription prior to commencing the surface sweeps. This burn was generally ineffective due to being late in the year, the existence of a minimum amount of natural fuel to support the fire, and persistent spring rains that left wet ground and wet vegetation that would not burn. Approximately 70% of the northwest end of the island burned and only small areas on the south and east end burned well. Grassy vegetation on approximately 40% of the island burned.

The island was subdivided into 695-60 meter X 60-meter grids. The corners of each grid were marked with wooden stakes. The southwest corner stake of each grid was marked with a grid reference number. Grids were numbered using an alpha-numeric system. The north- south lines were lettered "A" through "GG". The east-west lines were numbered "1" through "42".

Sweep Teams. Four UXO Teams, each consisting of one UXO Specialist and four UXO-trained laborers, conducted the surface clearance. Each UXO team walked over the entire grid searching for ordnance items, target materials and man-made objects larger than two inches. Team members used Schonstedt Model GA-52CX magnetometers to aid in searching for ordnance items and other metallic objects on or near the surface. The UXO Specialists recorded all objects found and their location in that grid on individual grid sheets. When a UXO or UXO related item was found it was marked with a flag. The UXO Specialist would examine it to identify its type, condition and if it was safe to move. After the entire grid was searched, the team members, under the direction of the UXO Specialists, would move "safe-to-move" items found to the edge of the grid to await pick-up by the recovery team. All large UXO and man-made items were left in place for subsequent removal with heavy equipment by the Recovery Team.

Recovery Team. The Recovery Team was composed of two UXO Specialists, four Laborers and two Heavy Equipment Operators. The recovery team made and repaired 4.75 miles of roads, installed drainage pipes and stabilized the roads as necessary to permit access for vehicles to move items. Using grid sheets to relocate items found by the sweep teams that the recovery team removed ordnance and explosives, target materials, and man-made objects from each grid. They

transported each of these items to a staging area for placement on the beach. UXO Specialists re-examined each ordnance or explosive item to verify their condition prior to removing it from the grid. Heavy equipment was used to remove partially buried practice bombs, target stands and other material from the grids. Ordnance and explosive items that could not be verified as inert, were left in place or grouped together with other ordnance and explosive items from other grids onto one grid for venting to verify inert status.

UXO Summary. A total of 11,021 ordnance and explosive items, weighing over 551,779 lbs. (276 Tons) were found during the surface sweeps. The following table lists items recovered during the surface clearance:

Table. UXO and UXO Related Items Recovered on Nomans Land Island

Nomenclature	Total Found	Weight	Total Weight (lbs.)	No. Vented
MK 76 Practice Bomb	2,799	25 lb.	69,975	2,183
MK 106 Practice Bomb	4,823	4.9 lb.	23,633	518
40 mm Projectiles	224	0.5 lb.	112	0
MK 41 Practice Bomb	23	4.5 lb.	103.5	39
MK 15 Practice Bomb	59	100 lb.	5,900	3
MK 7 Practice Bomb	20	1000 lb.	20,000	0
MK 117 Practice Bomb	2	500 lb.	1,000	0
M 124 Practice Bomb	697	250 lb.	174,250	162
MK 81 Practice Bomb	33	250 lb.	8,250	4
MK 82 Practice Bomb	451	500 lb.	225,500	308
MK 83 Practice Bomb	8	1000 lb.	8,000	1
3" Projectile	6	25 lb.	150	1
6" Projectile	2	75 lb.	150	0
2.25" Practice Rocket	422	13 lb.	5,486	467
2.75" Rocket Warhead	244	18 lb.	4,392	120
5" Rocket Warhead	72	54 lb.	3,888	73
5" Rocket Motor	19	38 lb.	722	6
MK 25 Marine Marker	1	15 lb.	15	0
MK 64 SUS Device	2	15 lb.	30	2
Various Small Arms	1,114	0.2 lb.	223	361

Scrap Metal and Other Materials. In addition to the ordnance and explosive items removed, over 59,000 pounds of non-ordnance and ordnance-related materials were collected and removed..

Quality Control Techniques. Quality control inspections were performed to ensure that ordnance and explosive materials and target marking materials were reliably removed from each grid. Ordnance and explosive materials and target marking materials were only removed from the surface. If an item penetrated the soil, but was visible on the surface, it was removed. The Quality Control Manager continuously observed the performance of various facets of the work and conducted inspections to ensure all phases were successfully conducted in accordance with approved procedures. The following summarizes the checks conducted by the Quality Control Manager:

- Reviewed and commented on operational plans.
- Observed and evaluated initial training, examinations and orientation.
- Observed and evaluated daily equipment calibration.
- Observed and evaluated performance of the sweep, recovery and explosive teams.
- Performed quality control checks on 5% of every grid by walking an X pattern across the grid. This check was performed after the completion of recovery and demolition operations. All Quality Control Inspections were documented and unusual or non-complying findings recorded in the Daily Report.
- Ensured that proper exclusion zones and controls were used during explosive procedures.
- Verified that approved demolition procedures were used.
- Observed and evaluated inspection procedures to assure that certified inert items contained no explosive materials.
- Inspected randomly selected lots of certified inert items and target materials to verify that no ordnance items were included with target materials and other non-ordnance related salvage items.
- Inspected randomly selected lots of inert certified ordnance and explosive related items to verify that no dangerous ordnance items were included.

Quality Control Summary. The Quality Control Manger performed Quality Control inspections on 695 grids. One grid failed this inspection. The Senior UXO Supervisor was notified of the failure, and the original sweep team re-performed the surface sweep of the entire grid. The failed grid passed a second Quality Control Inspection.

UXO DISPOSAL

Venting. Each item removed from the target areas of the island was examined three different times by UXO Specialists to determine and verify the condition of the ordnance items. Items that could not be visibly certified as "5X" or needing to have their cases vented for inspection were set aside for later consolidated treatment. Ordnance items that required explosive treatment to determine if any explosives or explosive residue remained were moved to collection areas on the island that was safe for explosive procedures. Explosive shaped charges and one pound explosive boosters were used to produce a hole or rupture the case of each suspect UXO item, thus exposing the filler. If any of the items had contained an explosive filler, it would have detonated or burned out during the explosive treatment. All ordnance items were inspected after explosive treatment to verify that any remaining filler was inert material. If any explosive filler remained, or if the filler could not be certified as inert material, the item was subjected to an additional explosive procedure. A total of 4,047 items were explosively treated.

Radiological Screening. Radiological Screening was conducted on all ordnance and target items to rule out any possibility of radiological contamination of any materials coming off the island for disposal. This screening was conducted by an independent contractor, selected by Foster Wheeler based on the recommendation of the Massachusetts Department of

Environmental Protection. The contractor measured the radiation levels at Aquinnah Point on Martha's Vineyard for use as a background or baseline level before conducting screening on the island. The items were screened while they were staged on the beach of Noman's Land Island. No above normal radiation levels were found. A separate report has been provided detailing the findings of this screening.

Sorting and Certification. All ordnance items and non-ordnance debris found on the island was transported to the base camp for sorting. A UXO Specialist re-inspected all material to verify that no ordnance or explosive material was present. If any item could not be certified as inert it was returned for explosive treatment. Ordnance items that could be certified as inert were painted with an orange marking to identify it and consolidated for transportation to the mainland. All ordnance items were physically separated from non-ordnance items.

Material Transportation off Island. A powered cargo vessel transported two 30-foot open top roll-off containers filled with ordnance and non-ordnance material to the mainland. The Quality Control Manager attached a Certification/Custody Form to each container. The form also served as a receipt for custody of the inert, non-hazardous materials. A copy of the signed form was given to the Captain of the vessel to give to the disposal contractor at the transfer of custody. This form listed the contents of the container and certified that the contents had been inspected and found to be free from explosives. The form was signed by the responsible UXO Specialist, the Quality Control Manager and the Site Superintendent. When the vessel reached the mainland, the Captain transferred custody of the containers to the disposal contractor.

Disposition of Ordnance and Explosive Scrap. Original plans called for all ordnance debris, scrap metal and rubber tires removed from the island are disposed through the Defense Reutilization and Marketing Service (DRMS) Office unless less costly alternatives were identified. DRMS policy requires that the generator retain custody of Ammunition, Explosives and other Dangerous Articles (AEDA) until sold. Current gluts of high quality scrap metal have caused purchasers to reject purchase of ordnance related scrap as risky. The cost of storage of scrap materials awaiting a better market was projected to consume any value, which could be obtained for the scrap if it were held. As an alternative, the scrap that had been inspected and certified as free of explosive materials, was processed to remove contained inert fillers and to distort the items by shearing or shredding so they no longer appeared to be ordnance items. The resulting materials were disposed as inert, non-hazardous waste.

The waste materials were classified, quantities estimated and proposals requested from all of the scrap dealers in the area. Frades Disposal Inc. offered the lowest cost for processing and disposal. All solid waste materials from the island were processed and disposed through Frades Disposal Inc.

Processing and Disposal. DoD rules require that ordnance related scrap materials must be certified as inert by a competent person, and if disposed or recycled, each item must be processed to be not recognizable as an ordnance item. Several processes were used to make the items not

recognizable as ordnance items. Concrete filled bombs were cut into several segments using a 100-ton fixed shear, the concrete and metal were separated, and the materials disposed separately as non-hazardous waste. Small practice bombs were shredded to demonstrate that no explosive materials remained in the items, and disposed as non-hazardous waste.

Release Abatement Measure (RAM), 120 Day Status Report, (Ordnance Debris Removal) RTN #4-13390. During completion of the ordnance RAM, all of the areas of the island that are reasonably accessible to persons were inspected and all ordnance and ordnance related items that could be found following the procedures contained in the RAM Plan were removed. There was no evidence of on-shore trespassing observed during the project, and workers and Foster Wheeler personnel followed Navy-approved work plans and the site specific health and safety plan. Permitted visitors were escorted by appropriately trained UXO Escorts.

Foster Wheeler completed all of the efforts described in the RAM Plan. All recovered ordnance, ordnance related items, target materials and other debris associated with Navy use of the island was removed from the island and then processed and disposed on the mainland.

The RAM was conducted in accordance with the RAM Plan and DEP approvals, and the MCP in 310 CMR 40.0440. No additional measures are planned for investigation or removal of subsurface or offshore ordnance or ordnance related materials. The RAM 120 Day Status Report was submitted to the DEP on September 17, 1998.

UNDERGROUND STORAGE TANK (UST) REMOVAL

Objective. The objective of the UST removal was to remove and dispose of all USTs, associated piping, residual contained material and any contamination.

Initial UST Removal. Only one UST was initially known to be on the island. Its location was near the center of the island approximately 150 yards due east of Ben's Pond. The top three inches of the tank was exposed along with a 4-inch access port. Before excavation the access plate was removed to sample the contents of the tank. Approximately 6 inches of liquid in the bottom of the tank was sampled and found to be uncontaminated water. The tank was excavated, cut into thirds and moved to the staging area on the beach. Piping was traced from the tank which lead to concrete foundations 75 feet southwest of the tank. The soil under the piping was sampled for contamination and none was found.

Additional UST Removal. Four additional tanks were later located during the course of the work. One tank was found on the northeast corner of Ben's Pond and three tanks were found on the north side of the island approximately 300 yards north of the known UST. These three tanks were found during the excavation of fuel pipes leading up from the beach.

The tank near Ben's Pond was partially above ground. After removing the structure and the soil over the tank, the tank was inspected, sampled and found not to contain any hazardous materials.

It was presumed to be a pressurized water tank. The tank was removed, cut-up into thirds and added to the metal scrap pile.

Three of the four USTs discovered contained petroleum products. Two of the tanks were partially filled with liquid, the third tank was full. All three tanks were sampled and were found to contain diesel fuel and some water. Approximately 13,000 gallons of diesel fuel was removed from the three tanks. The diesel fuel was drained into a tank brought out on the transport vessel and transported to the mainland for disposal. The tanks were then removed, cleaned, cut up and transported to the mainland. Mid-City Scrap Metal, a certified tank disposal contractor, disposed of the tanks. The ground underneath the tanks was stained with fuel. The stained soil was removed and follow-up sampling verified that all contamination had been removed. The stained soil was disposed as petroleum contaminated soil. All holes were back filled with native soil from the island.

Release Abatement Measure (RAM), Completion Report, (Closure Of Underground Storage Tanks) RTN #4-13390. During completion of the RAM, the site and the area encompassing the USTs consisted of an uninhabited island with vegetated ground cover as described in the RAM Plan. The only potential human receptor during implementation of the RAM would have been a trespasser, worker, and Foster Wheeler personnel. There was no evidence of on-shore trespassing observed during the project, and workers and Foster Wheeler personnel followed Navy-approved work plans and the site specific health and safety plan. Permitted visitors were escorted by appropriately trained UXO Escorts.

Prior to beginning the field work, a request for determination of applicability was filed with the Chilmark Conservation Commission under the Massachusetts Wetlands Protection Act, concerning the removal of the fuel line from the coastal dune, and the potential fuel line removal from within resource areas (i.e., wetlands and buffer zones) on the island. The request was submitted to the Conservation Commission and DEP on May 12, 1998. During a hearing on May 27, 1998, the Chilmark Conservation Commission granted a negative determination (work did not require the filing of a Notice of Intent).

Foster Wheeler completed this RAM on Nomans Land Island to originally remove one documented fuel storage UST and a 4-inch fuel pipeline. Subsequently, Foster Wheeler discovered and removed three additional fuel USTs and a small pipeline associated with the original UST. The RAM excavations removed all of the USTs and associated piping and contaminated soil (approximately 25 cubic yards). Based upon the results of post-excavation soil analyses and in comparison to Massachusetts Contingency Plan (MCP) Method 1 risk characterization standards, no petroleum contamination was present in the remaining excavations, or in the case of the Tanks 3 & 4 excavation, the contaminated soil was removed and properly disposed. All remediation waste associated with the RAM was transported off-site for appropriate disposal.

The RAM was conducted in accordance with the RAM Plan and DEP approvals, and the MCP in 310 CMR 40.0440. The objectives of the RAM, closure of USTs and associated pipelines, have been achieved and no further activities related to the RAM are necessary. Therefore, the RAM is considered complete. The RAM Report was submitted to the DEP on September 23, 1998.

LIMITED SITE INVESTIGATION REPORT - PHASE I, RTN #4-13390

The Phase I Report presents the Phase I Field Investigation Program, including an overview of site geology and hydrogeology, and a description of the nature and extent of contamination based upon the Phase I sampling, field screening and laboratory analyses. Based upon the collected data, the site scored 508 points and is classified as a Tier IB site. Therefore, a Tier IB Permit Application was submitted with the Phase I Report and Tier Classification submittal. On January 14, 1999, the MADEP determined that the Tier IB Response Action Permit Application No. BWSCBWS02 was complete and adequate. The notification required actions beyond the scope of this delivery order.

STRUCTURE REMOVAL

Objective. The objective of structure removal was to demolish unsound and unsafe structures remaining from Navy operations, remove all associated materials, remove any contamination and properly dispose of all waste generated.

Buildings. Two buildings were identified for demolition. These buildings were located on the north side of the island. They were constructed of concrete foundations, concrete and masonry bricks and a metal frame roof. Both buildings were collapsed and only approximately three feet of the walls were left standing. An excavator was used to tear down the walls and remove the debris. All debris was checked for ordnance and explosive items before moving the debris to the staging area for transport and disposal on the mainland. Both foundations were left in place.

Disposal. All inert ordnance, target material and building debris was removed from the island, transported to the mainland and turned over to Frades Disposal Inc., for disposal or recycling. The 300 tons of inert ordnance material was sheared, shredded or crushed beyond recognition before being recycled or disposed of by Frades Disposal Inc.

Unresolved Issues. The possibilities of subsurface UXO, ordnance and explosive contamination still exits on the island and in the internal and surrounding waters, and in areas with thick brush. Surface, subsurface and heavy brush areas were not in the scope of work. Ordnance and explosive items may still be buried underground or in the bottom of the ponds located on the island. Large UXO, and other munitions have the potential to completely penetrate the surface and remain underground. Some of these ordnance items may be explosive, presenting a hazard to anyone finding them.

Ordnance and explosive items are in the waters around the island. When the beach was searched initially at extreme low moon tide, sweep teams found five 500-pound bombs and over 100 smaller ordnance items. A subsequent search following a major storm resulted in discovery of additional UXO items. Each major storm appears to deposit new ordnance items on the shoreline.

ACCESS TO THE ISLAND

Navy Pier and Cove. A small rock jetty on the northern side of the island produced a small cove where the US Navy built a pier to tie-up vessels coming out to the island. Today the pier has deteriorated to the point that the only evidence of its existence is the eroded pylons protruding above the water. The cove has diminished in size over the years due to accretion.

Other Structures. Remains of two concrete block buildings and another concrete pad overlooked the pier. Several concrete pads exist near the center of the island, just east and south of Ben's Pond. Several historic stone walls on the northern side of the island and a wood and stone cistern exist near the center of the island.

Roads. The roads left by the Navy consisted of a road through the center of the island running north and south and looping around the east end of the island and on the northern side of the island running from the center across the northern edge around the west end stopping at the runway. All roads were improved by filling in washed out areas and installing drainage pipes (on the eastern end of the island) and matting material (in several locations) to help stabilize the roads. A road was cut down the runway to adjoin the north-south road and the western end road.

Personnel. Personnel embarked onto a crew boat at the New Bedford Marina and transited 23 miles to Noman's Land Island, taking approximately two to four hours (depending on the weather and currents) each way to complete the transit. The leeward side of the island near the remnants of the Navy pier was selected to be the best place to disembark personnel due to the sandy bottom, southerly prevailing winds and minimal effect of surf and surge. Initially no platform was in place to disembark personnel onto the island. A six man skiff was anchored off the beach and used to ferry personnel to and from the island from the crew boat. This method was hazardous in less than favorable seas and took approximately 40-45 minutes each way to complete. Prevailing winds were normally out of the south or south-southwest causing a lee on the north side of the island. If winds were out of any other direction and over 15-mph, the surf was too rough to transport personnel ashore for fear of injuring personnel or capsizing the skiff during transfer.

Boat Landing. A boat landing was built to decrease the time it took to off load personnel (5 minutes) and provide a safer means to accomplish the personnel transfer onto the island. Three 10 x 20 foot floating pontoons were brought out to the island, tied together and anchored. This provided a platform for the crew boat to tie to and a walkway onto the beach for personnel. The pontoons were susceptible to the winds and sea conditions. If other than the prevailing southerly

winds were blowing, the pontoons would bounce up and down , and collide, resulting in an unsafe platform to load and unload personnel to and from the crew boat. The pontoon system required daily maintenance. When the winds and sea conditions became rough the pontoons twice broke their moorings leaving no means to transfer personnel ashore, other than the small skiff, until the pontoons could be repositioned and anchored. Development of a permanent docking facility was not warranted by the short duration of the work.

Barge. A 60 X 200-foot barge was initially used to transport shipping containers, equipment and vehicles to the island. The barge was equipped with a ramp to allow the equipment to drive off onto the beach. Two tugs were required to transport the barge to the island. The tug landed the barge on the island adjacent to the crew boat landing and could only off-load equipment at high tide. Off loading was quick and effective.

Coast Guard Policies. All marine vessels carrying personnel require certification and inspection by the US Coast Guard. A Certificate of Documentation and a current Certificate of Inspection is required to be on-board prior to transporting personnel or cargo. A vessel carrying cargo must hold both certifications to transit beyond Aquinnah Point (formerly known as Gay Head), on Martha's Vineyard. South of this point is considered ocean waters and to operate in these waters require the vessel to meet strict US Coast Guard standards. Efforts to locate a large, appropriately certified barge at a reasonable price were unsuccessful. A certified powered vessel with a ramp was contracted to complete the transit to and from the island. The certified vessel required many smaller trips to transport the debris, ordnance related scrap and equipment off the island.

If you require additional information, please call me at (215) 702-4016.

Sincerely,

Arthur B. Holcomb
Program Manager

ABH/cd
cc: J. McIlrath
File