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FINAL EXPANDED SITE INSPECTION REPORT FORMER CAT ISLAND BOMB TARGET BT-2 MCAS CHERRY POINT NC

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CH2M HILL

Final

Expanded Site Inspection Report
Former Cat Island Bomb Target BT-2

Marine Corps Air Station Cherry Point
North Carolina

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Executive Summary

This document presents the data, results, and conclusions for the Expanded Site Inspection (SI) conducted in March 2014 at the Former Cat Island Bomb Target BT-2 (hereafter referred to as BT-2) associated with Marine Corps Air Station (MCAS) Cherry Point, North Carolina. The Expanded SI was performed in accordance with the *Amendment to the Expanded Site Inspection Work Plan for Munitions Response Program, Former Cat Island Bomb Target BT-2* (CH2M HILL, 2014a); the *Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan), Former Cat Island Bomb Target BT-2, Expanded Site Inspection* (SAP) (CH2M HILL, 2010); and the *Explosives Safety Submission (ESS) for Munitions Response Activities Former Cat Island Bomb Target BT-2 and Surface Danger Zone* (CH2M HILL, 2014b).

BT-2 is a closed range located near Wood Island in Bogue Sound in Carteret County, between the town of Emerald Isle, North Carolina, and the mainland. The coordinates of BT-2 were modified several times during operation of the target location, but all target coordinates were located in the vicinity of Wood Island. The site consists of an approximately 10-acre island primarily covered with marsh grasses and other vegetation with sandy beaches located on the northern and southern sides of the island.

The primary objective of the Expanded SI was to perform a surface removal of munitions and explosives of concern (MEC) and material potentially presenting an explosive hazard (MPPEH) and non-munitions related debris that has accumulated on the surface of Wood Island after surface removal activities were performed in 2010. Since the previous surface removal, additional MPPEH had accumulated on the surface of Wood Island due to erosion and tidal action. The March 2014 surface removal was performed in the sandy areas along the northern and southern shorelines, as MPPEH was observed only in these areas.

A total of 4,612 pounds of MPPEH were removed from the surface of Wood Island during the surface removal activities conducted between March 19 and 27, 2014. The MPPEH was transported from Wood Island to nearby Marine Corps Auxiliary Landing Field (MCALF) Bogue, where it was inspected and certified as material documented as safe (MDAS). The MDAS was demilitarized on MCALF Bogue, as necessary, prior to shipment of the material to Bonetti Explosives, Inc. in Columbus, Texas for disposal by thermal treatment.

One MEC item, a 100-pound general purpose bomb, was identified on Wood Island during the surface removal. The item was destroyed on Wood Island by controlled detonation. Vibration monitoring was performed on Wood Island and nearby Bogue Banks during the controlled detonation and the results indicated that vibrations from the detonation did not impact the nearby residential areas.

Following the controlled detonation of the 100-pound general purpose bomb, surface soil samples were collected from the detonation area in accordance with the SAP (CH2M HILL, 2010). The samples were analyzed for explosives residues, perchlorate, and target analyte list (TAL) metals. Explosives residues and perchlorate were not detected in any of the site samples, and all detected metals concentrations were less than background concentrations.

A human health risk screening (HHRS) and ecological risk screening (ERS) were performed on the post-detonation sample results. The results of the HHRS and ERS indicated that there are no unacceptable risks to human or ecological receptors due to the controlled detonation activities.

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Acronyms and Abbreviations

AOP	air overpressure
BT	Bomb Target
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long-term Environmental Action—Navy
COPC	chemical of potential concern
DGM	digital geophysical mapping
EcoSSL	Ecological Soil Screening Level
EOD	Explosive Ordnance Disposal
EPC	exposure point concentration
EQ	Environmental Quality
ERS	ecological risk screening
ESS	explosives safety submission
ESV	ecological screening value
HHRS	human health risk screening
HI	hazard index
HQ	hazard quotient
IDW	investigation-derived waste
MCALF	Marine Corps Auxiliary Landing Field
MCAS	Marine Corps Air Station
MCIE-MCB CAMLEJ	Marine Corps Installations East-Marine Corps Base Camp Lejeune
MDAS	material documented as safe
MEC	munitions and explosives of concern
mm	millimeter
MPPEH	material potentially presenting an explosive hazard
MRP	Munitions Response Program
msl	mean sea level
NAVFAC	Naval Facilities Engineering Command
Navy	Department of the Navy
NCDENR	North Carolina Department of Environment and Natural Resources
NC HWS SSL	North Carolina Hazardous Waste Site Soil Screening Level
PA	Preliminary Assessment
PD	particle displacement
PETN	pentaerythritol tetranitrate
PV	particle velocity
QA	quality assurance
QC	quality control
RSL	regional screening level
SAP	Sampling and Analysis Plan
SDZ	Surface Danger Zone
SI	Site Inspection
TAL	target analyte list
USEPA	United States Environmental Protection Agency
UXO	unexploded ordnance

SECTION 1

Introduction

Marine Corps Air Station (MCAS) Cherry Point is in the process of investigating closed ranges in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) investigation process. Due to historical activities at the Former Cat Island Bomb Target (BT)-2 and associated surface danger zone (SDZ) (collectively referred to hereafter as BT-2), a Munitions Response Program (MRP) Expanded Site Inspection (SI) was conducted at the site in March and April 2014. This Expanded SI was conducted by CH2M HILL under the Naval Facilities Engineering Command (NAVFAC) Atlantic, Comprehensive Long-term Environmental Action—Navy (CLEAN) Contract No. N62470-08-D-1000, Contract Task Order 69.

This document summarizes the surface removal activities, soil sampling analytical results, risk screenings, and conclusions for the BT-2 Expanded SI. The Expanded SI was conducted to remove munitions and explosives of concern (MEC) and material potentially presenting an explosive hazard (MPPEH) from the surface of Wood Island. The surface removal focused on MEC/MPPEH located within the sandy areas on the northern and southern shorelines of Wood Island, where MEC/MPPEH was observed due to erosion and tidal action. MEC/MPPEH were not observed within the upland and marshland portions of the island.

The Expanded SI was performed in accordance with the *Amendment to the Expanded Site Inspection Work Plan for Munitions Response Progra*m, Former Cat Island Bomb Target (BT-2), Marine Corps Air Station Cherry Point (CH2M HILL, 2014a), referred to herein as the Work Plan; the *Sampling and Analysis Plan (SAP) (Field Sampling Plan and Quality Assurance Project Plan), Former Cat Island Bomb Target BT-2, Expanded Site Inspection* (CH2M HILL, 2010); and the *Explosives Safety Submission (ESS) for Munitions Response Activities Former Cat Island Bomb Target BT-2 and Surface Danger Zone* (CH2M HILL, 2014b).

1.1 Objectives

The objective of the Expanded SI was to perform a surface removal of MEC/MPPEH from the surface of Wood Island to protect human health and the environment. Soil sampling and vibration monitoring activities were performed to support the surface removal activities.

1.2 Report Organization

This Expanded SI Report is composed of the following sections:

- **Section 1 – Introduction;** provides the project scope and objectives of the Expanded SI and the format for report organization.
- **Section 2 – Site Background;** provides a general description of BT-2 and summarizes the site history.
- **Section 3 – Field Investigation Activities;** identifies the technical approach, methods, and operational procedures that were used to perform the surface removal activities.
- **Section 4 – Investigation Results;** summarizes the results of the surface removal activities, including vibration monitoring results and post-detonation sampling analytical results.
- **Section 5 – Human Health Risk Screening (HRS);** evaluates the potential for human health risks associated with exposure to surface soil at BT-2 that may have been impacted by controlled detonation activities.
- **Section 6 – Ecological Risk Screening (ERS);** evaluates the potential for ecological risks associated with exposure to surface soil at BT-2 that may have been impacted by controlled detonation activities.
- **Section 7 – Conclusions and Recommendations;** summarizes the findings of the investigation and provides recommendations for further actions based on these findings.
- **Section 8 – Reference**s; lists the references cited in the preceding sections.

SECTION 2

Site Background

This section presents a summary of regional and site-specific background information, including location, site setting, physical characteristics, and site history.

2.1 MCAS Cherry Point Location and Description

MCAS Cherry Point is a 13,164-acre military reservation located north of the town of Havelock, in southeastern Craven County, North Carolina (**Figure 2-1**). Commissioned in 1942, MCAS Cherry Point currently provides support facilities and services for the Second Marine Aircraft Wing, the Fleet Readiness Center – East, Service Support Detachment 21 of the Second Force Service Support Group, the Naval Air Maintenance Training Group Detachment, and the Defense Reutilization and Marketing Office. MCAS Cherry Point maintains facilities for training and supporting the Atlantic Fleet Marine Force aviation units and is designated as a primary aviation supply point. BT-2 is a former range associated with MCAS Cherry Point and is located approximately 14 miles south of the Air Station.

2.2 BT-2 Site Description

BT-2 is a closed range located in Bogue Sound in Western Carteret County, North Carolina, between the town of Emerald Isle and the mainland, and centered at Latitude 34º 41’ 12”N and Longitude 76º 57’ 06” W, as shown on **Figure 2-1**. BT-2 is composed of three bomb target coordinate locations that were in use from 1945 to 1955 and a 3-mile SDZ surrounding the targets, as shown on **Figure 2-2**. The former bomb target coordinates, which were modified several times during operation of this target, were located in the immediate vicinity of Wood Island in Bogue Sound. Wood Island is an approximately 10-acre island covered with marsh grasses and other vegetation, with sandy beaches located on the northern and southern sides of the island. The SDZ encompasses Wood Island and portions of Bogue Sound, mainland North Carolina, the Bogue Banks barrier island, and the Intracoastal Waterway. A graphical representation of the conceptual site model for BT-2 is presented on **Figure 2-3**.

2.3 Site History

2.3.1 Historical Site Use and Management (1943 – 2007)

From 1943 to 1952, BT-2 was used for aerial bombing practice from aircraft using inert, target-practice munitions. In 1952, the use of live ammunition was initiated at the site (Navy, 1957a). The *Range Identification and Preliminary Range Assessment Report* (USACE, 2001) indicates that general purpose bombs, armor piercing bombs, semi-armor piercing bombs, depth bombs, rockets and machine guns (.30 caliber to 20 millimeter [mm]) were used for training activities at BT-2. The estimated penetration depths of munitions varies according to the type of munitions that were used (USACE, 2001). Air-delivered ordnance, including up to 2,000-pound bombs, were reportedly used on the island. A memorandum dated April 5, 1956, indicated that the Navy and/or Marines had discontinued the use of BT-2 for bombing purposes in approximately 1955 (Navy, 1956).

The Department of the Navy (Navy) leased the Wood Island property from 1943 to 1955 (Maulick, 1943). In 1955, the Navy proposed to acquire the land because it was economically impractical to restore the property to its original condition (Navy, 1957a). On April 24, 1956, the Navy acquired the land by condemnation proceedings and a Declaration of Taking (Navy, 1957b).

The Navy performed UXO clearance, referred to as surface decontamination, of Wood Island in 1957. The details and extent of the UXO clearance are unknown. At that time, the Navy concluded that there was a high probability that UXO was present below the surface of the island that could not be detected by probing,

and that UXO may continue to be exposed through tidal action and storms. The Navy stated that Wood Island remained a potentially dangerous area (Navy, 1957c).

On November 21 and 27, 1963, the MCAS Cherry Point Explosive Ordnance Disposal (EOD) team conducted a surface sweep of Wood Island for UXO. No UXO was found; however, items of inert and expended ordnance were observed. At that time, the Navy would not certify that Wood Island had been decontaminated with respect to UXO due to the potential for ordnance to be buried to a depth of 30 feet or more and due to the potential for buried ordnance to be brought to the surface through tidal action and storms (USMC, 1963).

In 1972, the Navy concluded that Wood Island could not be released from Department of Defense control, as the high cost of complete unexploded ordnance (UXO) removal made disposal of the property infeasible (Navy, 1972). Although the land is no longer being used for military training, ownership of Wood Island is still retained by the Navy.

MCAS Cherry Point EOD performed a site visit to Wood Island in August 2007. Miniature practice bombs and rocket components were identified on the island surface and were destroyed by EOD personnel. Further site reconnaissance visits were made to Wood Island in February 2008 and January 2009 by the Navy and MCAS Cherry Point personnel. During these site reconnaissance visits, surface and partially-buried MPPEH were observed on the island. A higher concentration of surface MPPEH was observed on the beaches located on the northern portion of Wood Island.

2.3.2 Preliminary Assessment/Site Inspection (2008 – 2009)

Under the Navy's Munitions Response Program, a Preliminary Assessment (PA)/SI began in 2008 with a review of historical records. During site visits to Wood Island, remnants of old munitions and munitions fragments were observed on the surface, along the shoreline, and partially buried on the island.

In the spring of 2009, an aerial digital geophysical mapping (DGM) survey was conducted over approximately 10 square miles of Bogue Sound surrounding Wood Island. The purpose of the DGM survey was to detect and accurately map the locations of metallic items, referred to as magnetic anomalies, on Wood Island and within the SDZ around BT-2. In addition, samples of soil on the island and samples of surface water and sediment on and around the island were collected and analyzed for munitions constituents (MC) such as metals and explosives residues. Explosives residues and perchlorate were either not detected or were detected at concentrations that did not exceed regulatory screening criteria. Metals concentrations were considered to be representative of natural or anthropogenic background conditions unrelated to impacts from munitions use.

During the aerial DGM survey of Bogue Sound, a digital map of magnetic anomalies on and around Wood Island was generated. DGM is not able to distinguish between munitions items and non-munitions items composed of ferrous metals.

The DGM survey identified approximately 10,400 magnetic anomalies. The highest concentrations of magnetic anomalies were clustered within approximately 650 feet of Wood Island. This mass of closely-spaced magnetic anomalies corresponds to the expected pattern of ordnance distribution for an aerial bombing target. Three much smaller clusters of magnetic anomalies were found in the investigation area further away from Wood Island in Bogue Sound, and may be unrelated to former aerial bombing.

The July 2010 PA/SI Report also included the results of preliminary human health and ecological risk assessment screenings. These risk assessment screenings did not address the explosive hazards potentially associated with munitions items, but rather, any potential environmental risks from exposure to munitions-related constituents such as explosives residues and metals. Based on the environmental data that were collected and analyzed in 2009, no unacceptable risks were identified to human health or to wildlife that might be exposed to MC in the surface soil, sediment, or surface water at BT-2. Therefore, no further evaluation of MC in the surface soil, surface water, and sediment was recommended on Wood Island or in Bogue Sound (CH2M HILL, 2010).

The PA/SI Report did conclude that the explosive hazards associated with munitions presented a potential risk to human safety. The MPPEH visible on the surface of Wood Island, and the high concentrations of magnetic anomalies in the water around the island, led the Navy to conclude that further action to address explosive hazards was needed.

2.3.3 Warning Signs Installation (2008 – 2012)

In 2008, 16 warning signs were installed on the shoreline of Wood Island to advise the public about the potential munitions hazards and to warn against trespassing on the island. The signs are approximately 3 feet by 3 feet in size and manufactured of .080-gauge aluminum. The signs read: “DANGER, UNEXPLODED ORDNANCE, DO NOT ENTER” in 3-inch-high letters (CH2M HILL, 2008).

In March 2012, MCAS Cherry Point and the Navy installed 20 additional warning signs in the shallow water around Wood Island, approximately 1,200 feet from the island’s shoreline. The purpose of the signs is to warn boaters of the danger posed by bottom-disturbing activities (such as anchoring, dredging, or clamming), thereby further reducing the chance of public exposure to MEC/MPPEH. These 2-foot-square signs are mounted on 20-foot long poles that extend approximately 9 feet above the surface of the water, and read: “DANGER, UNEXPLODED ORDNANCE, NO ANCHORING OR BOTTOM DISTURBING ACTIVITIES.”

2.3.4 Expanded Site Inspection and Surface Removal Activities (2010)

In October and November 2010, MCAS Cherry Point and the Navy conducted an Expanded SI and surface removal effort to identify and remove munitions-related items, fragments, and other metallic items from the surface of Wood Island.

Approximately 3,900 pounds of MPPEH were removed from the island, along with 120 pounds of other metallic debris related to recreation and fishing activities in Bogue Sound. No controlled detonations were needed to destroy items, as all MPPEH items encountered were safe to move. The MPPEH and other metallic debris were moved from the island to Marine Corps Auxiliary Landing Field (MCALF) Bogue (a nearby Marine Corps installation on the North Carolina mainland), documented as safe, and demilitarized using a shredder. All of the material documented as safe (MDAS) was shipped to a metal recycling facility for disposal. Details of Expanded SI activities are presented in the After Action Report (CH2M HILL, 2011).

2.4 Site Geology

The marshland soils at Wood Island are level and very poorly-drained mucks. The dominant soil is classified as the Newhan-Corolla complex, and is composed of marine sediment deposits and organic mucks. Some marshlands are present on the island, and have semi-permanently saturated and flooded soils. The northern one-third (4 acres) of the island is a vegetated sandy dune including trees and bushes, with an elevation of 9 feet above mean sea level (msl); the elevation of the southern two-thirds of the island is less than 3 feet above msl. Strong storm tides may flood the terrestrial dune habitat (USMC, 2001). Visible erosion of the terrestrial dune habitat has been observed since 2008. The sediments surrounding the island are predominantly poorly-graded fine sands with trace to minor clay and silt components.

R:\USNavFacEngCom405450\CherryPoint\GIS_Folders\MapFiles\387134_BT_2_AAR\Figure 2-1 - Base Location Map.mxd6/9/2014cbowman

Legend

- MRS Boundary and 3-Mile Surface Danger Zone
- Installation Boundary

N
W E
S

0 8,500 17,000
Feet

Figure 2-1
Base Location Map
Former Cat Island Bomb Target BT-2
MCAS Cherry Point
North Carolina

Version 1, June 2014

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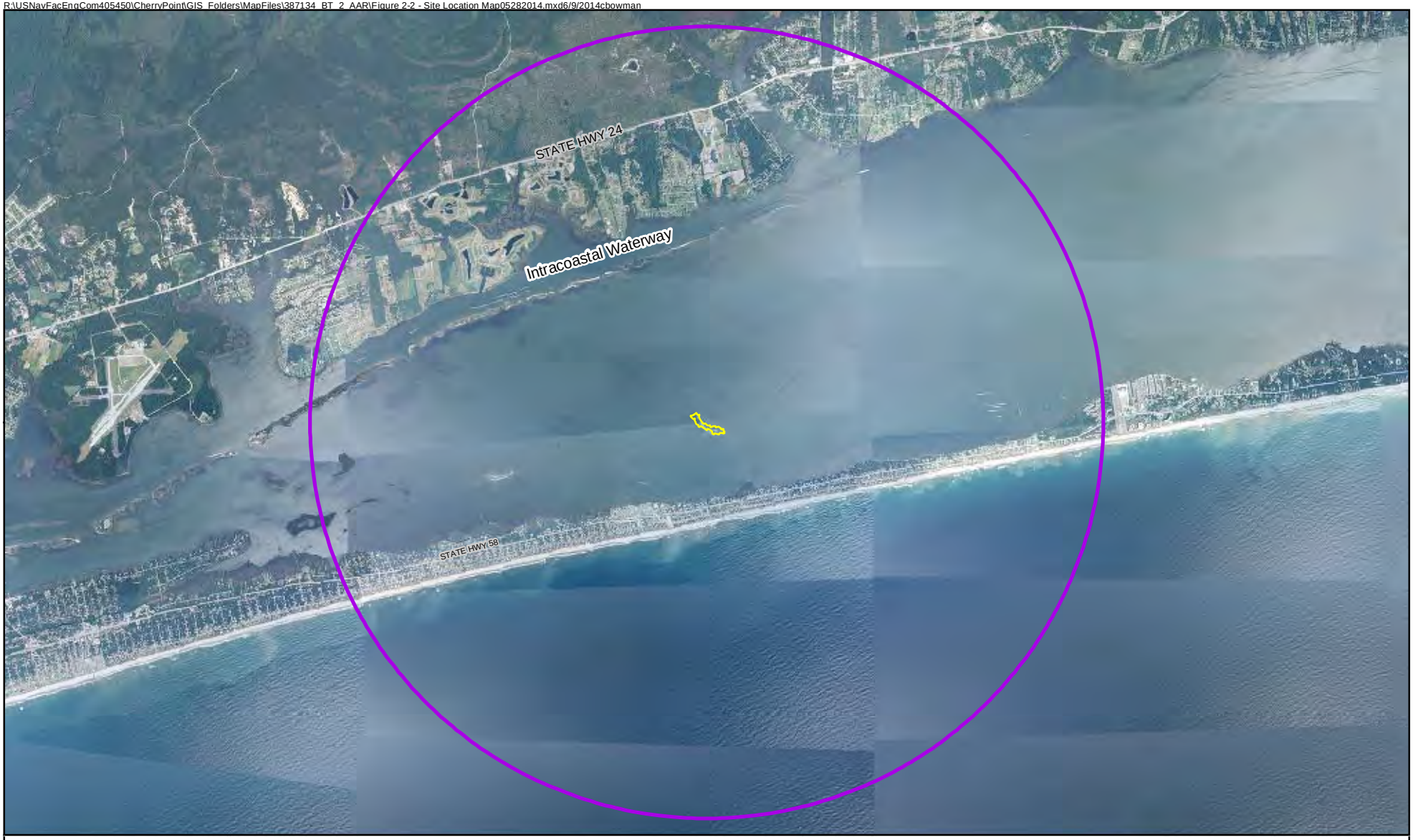
R:\USNavFacEngCom405450\CherryPoint\GIS_Folders\MapFiles\387134_BT_2_AAR\Figure 2-2 - Site Location Map05282014.mxd6/9/2014cbowman



Legend

- Wood Island
- MRS Boundary and 3-Mile Surface Danger Zone

N
W E
S

0 2,750 5,500
Feet

Figure 2-2
Site Location Map
Former Cat Island Bomb Target BT-2
MCAS Cherry Point
North Carolina

Version 1, June 2014

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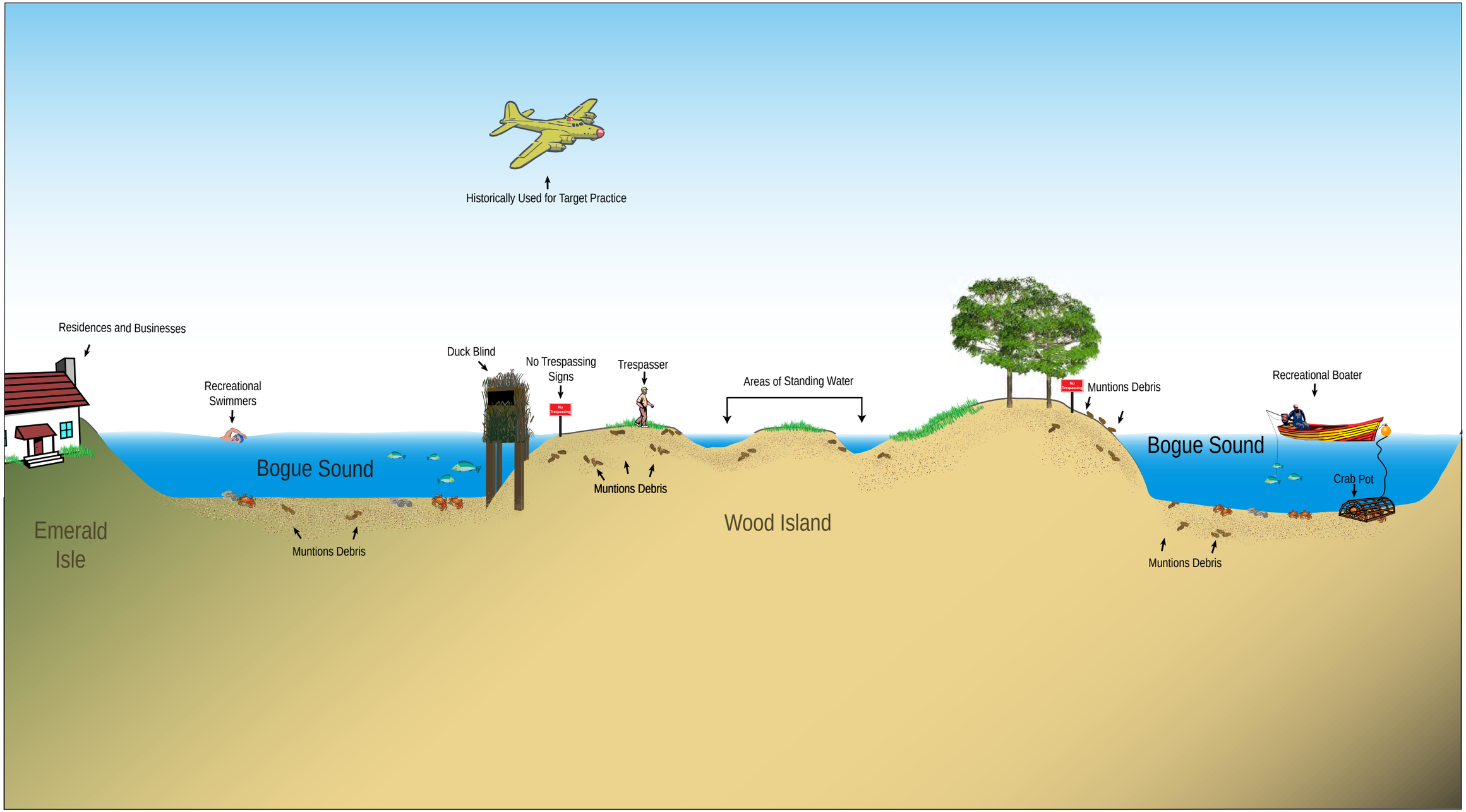


Note: Not to Scale

Figure 2-3
Conceptual Site Model
Former Cat Island Bomb Target (BT-2)
MCAS Cherry Point
North Carolina

SECTION 3

Field Investigation Activities

Field investigation activities were performed in accordance with the Work Plan (CH2M HILL, 2014a), the ESS (CH2M HILL, 2014b) and the SAP (CH2M HILL, 2010).

3.1 Surface Removal Activities

3.1.1 MEC and MPPEH Removal

- Surface removal activities on Wood Island were performed by USA Environmental, Inc. of Tampa, Florida. UXO technicians operated under the supervision of CH2M HILL from March 19 through 27, 2014. The surface removal focused on MEC/MPPEH located within the sandy areas on the northern and southern shorelines of Wood Island that had been exposed due to erosion and tidal action. MEC/MPPEH were removed down to the low tide line. MEC/MPPEH were not observed within the upland and marshland portions of the island. The approximate extent of surface removal activities on Wood Island is presented on **Figure 3-1**.
- A total of 4,612 pounds of MPPEH and non-munitions related debris were removed from the surface of Wood Island and transported by boat to MCALF Bogue. The MPPEH was inspected after using a chop saw and drill press, as necessary, to expose all surfaces of items potentially containing explosives. All MPPEH was inspected for the presence of energetic material and, following two visual inspections where no energetic materials were identified, the material was designated as MDAS. The MDAS was demilitarized on MCALF Bogue, as needed, prior to shipment to Bonetti Explosives, Inc. in Columbus, Texas for final disposal by thermal treatment. Copies of the DD Form 1348-1A prepared for each drum shipped to Bonetti and the final documentation for MDAS destruction are included in **Appendix A**.
- One MEC item, a 100-pound general purpose bomb, was identified on Wood Island during the surface removal on March 20, 2014. The MEC item was placed under guard until the controlled detonation was performed. The intentional detonation exclusion zone was enforced during the detonation activities.

A summary of the items recovered from Wood Island is included in the table below:

TABLE 3-1
Items Recovered During Surface Removal

Category	Description	Quantity
MEC	Bomb, GP, 100-lb, AN-M30	1 item
MPPEH	Rocket, Practice, SCAR nose cones	49 items
MPPEH	Rocket, Practice, SCAR	195 items
MPPEH	Bomb, AN-Mk23, Practice	772 items
MPPEH	Mk45 parts	2 items
MPPEH	Mk15 parts	2 items
MPPEH	M905 Tail Fuze part	1 item
Scrap	Metallic surface debris	1,960 pounds

3.1.2 North Carolina Department of Environment and Natural Resources Temporary Emergency Permit

MPPEH recovered on Wood Island was transported to MCALF Bogue in accordance with North Carolina Department of Environment and Natural Resources (NCDENR) Temporary Emergency Permit No. NC3 170

024 605 E1. This permit allowed all MPPEH generated from surface clearance activities on Wood Island to be transported to MCALF Bogue for temporary storage and demilitarization prior to being certified as MDAS. The permit is included in **Appendix B**.

3.1.3 Vibration Monitoring

Vibration monitoring was performed by GEONOR, Inc. of Augusta, New Jersey during the controlled detonation event to evaluate whether vibrations from the detonation may have impacted the nearby residential areas on Bogue Banks.

Velocity transducers (vibration monitoring points) were set up at three locations as shown on **Figure 3-2**: one approximately 200 feet north of the controlled detonation location on Wood Island (VMP-1), one at the northern end of Burlington Street in the town of Emerald Isle (VMP-2), and one at Park Drive in Emerald Isle (VMP-3). Velocity-sensitive transducers (three-axis geophones) were placed on the ground surface to record the frequency and amplitude of the ground motion.

The transducers were set up to record in both histogram and waveform modes. In histogram mode, the peak values of particle velocity (PV), particle displacement (PD), and air overpressure (AOP) were measured over predetermined time periods, and in waveform mode, each of the measured PV, PD, and AOP were recorded if a threshold value of 0.05 inches/second was achieved. The threshold value was selected to be generally greater than background levels but below the typical value that would potentially cause structural damage.

The results of the vibration monitoring indicated that the controlled detonation did not cause vibration levels that could potentially cause structural damage to residences on Bogue Banks. VPM-1 (located on Wood Island) recorded both histogram and waveform data, as expected, since this geophone was located closest to the detonation point and had the highest recorded PV value of 0.225 inches/second. The second waveform measurement at VPM-1 was likely generated due to a piece of debris landing near the geophone approximately 5 seconds after detonation. Vibration levels in the VPM-2 and VPM-3 geophones did not reach the threshold value of 0.05 inches/second; therefore; no waveform data were recorded. The vibration monitoring data are included in **Appendix C**.

3.1.4 Post-Detonation Surface Soil Sampling

Four post-detonation surface soil samples were collected on March 21, 2014 following the controlled detonation of the 100-pound general purpose bomb. Soil sampling was performed in accordance with the SAP (CH2M HILL, 2010). One surface soil sample (BT2-SS01) was collected using the TR-02-01 sampling approach in an area measuring 1 meter by 1 meter (Thiboutot, Ampleman, and Hewitt, 2002) at the detonation location. Thirty sample aliquots were composited from random locations within the 1-meter by 1-meter sample area from depths of 0 to 2 inches below ground surface.

Three replicate samples (BT2-SS02 through BT2-SS04) were collected outside the TR-01-01 sampling area, but within a radius of 10 meters of the detonation location, to encompass the visible ejecta pattern. Thirty aliquots of soil were collected per replicate from 0 to 2 inches below ground surface and homogenized in accordance with the *Post-Detonation Surface Soil Sampling for Munitions Constituents Standard Operating Procedure* in Appendix A of the SAP (CH2M HILL, 2010).

Surface soil samples were collected using disposal spatulas and plastic zip-top bags for homogenization. The sample location coordinates were recorded using a handheld global positioning system (GPS). All soil samples were analyzed for explosives residues, including pentaerythritol tetranitrate (PETN) and nitroglycerin, by United States Environmental Protection Agency (USEPA) Methods 8330/8332, perchlorate by USEPA Method 6850, and target analyte list (TAL) metals, including mercury, by USEPA Methods 6010/7471B.

3.1.5 Quality Assurance/Quality Control Sampling

Appropriate quality assurance (QA)/quality control (QC) sampling was performed in accordance with the SAP (CH2M HILL, 2010), including the collection of temperature blanks and duplicate samples (field and matrix spike/matrix spike duplicates).

3.1.6 Investigation Derived Waste

Investigation-derived waste (IDW) generated during surface removal activities included non-hazardous soil, disposable sampling equipment, and personal protective equipment.

Soil IDW was generated during MPPEH inspection activities as the soil was removed from the MPPEH during the inspection process. The soil IDW was placed in a 55-gallon steel drum. One soil sample (BT2-IDW) was collected from the IDW drum for laboratory analysis, from which the soil was determined to be non-hazardous. A&D Environmental Services, Inc. of High Point, North Carolina transported the soil IDW drum to the Environmental Quality Florida disposal facility identified as USEPA ID# FL 961392494 in Tampa, Florida. The IDW analytical results and waste manifest for the IDW disposal are included in **Appendix D**.

Disposable sampling equipment and PPE generated during surface clearance activities were placed in black contractor trash bags and placed in dumpsters on MCALF Bogue for disposal.

3.2 Data Tracking and Validation

The sample identification numbers and required analytical tests were recorded on chain-of-custody forms, which accompanied the post-detonation samples to the Empirical Laboratories, LLC, in Nashville, Tennessee. Chain-of-custody entries were checked against the project instructions and SAP to verify that all designated samples were collected and submitted for the appropriate analyses. Upon receipt of the samples by the laboratory, a comparison was made to verify that each sample was analyzed for the correct parameters against the field information. In addition, a check was made to ensure that the appropriate numbers and types of QA/QC samples were collected.

Analytical data reports, in hard copy and electronic format, were submitted to Environmental Data Services of Williamsburg, Virginia, for third-party validation. The procedures used for the validation process included *National Functional Guidelines for Organic Data Review* (USEPA, 1999) and *National Functional Guidelines for Inorganic Data Review* (USEPA, 2004).

The validation process focused on the usability of the data to support the project decision-making process.

Sample results may include a qualifying flag, such as:

- **U—Undetected.** Samples were analyzed for this analyte, but it was not detected above the indicated method detection limit or instrument detection limit.
- **UJ—Detection limit estimated.** Samples were analyzed for this analyte, but the results were qualified as not detected. The indicated method detection limit or instrument detection limit is estimated.
- **J—Estimated.** The analyte was present, but the reported value is estimated and may not be accurate or precise.

R:\USNavFacEngCom405450\CherryPoint\GIS_Folders\MapFiles\387134_BT_2_AAR\Figure 3-1 - Wood Island Surface Clearance Extent05282014.mxd12/16/2014JClements_ch2mhillen

Legend

- Controlled Detonation Location and Soil Sample Location
- Wood Island Site Boundary
- Wood Island Surface Clearance Area

N
W E
S

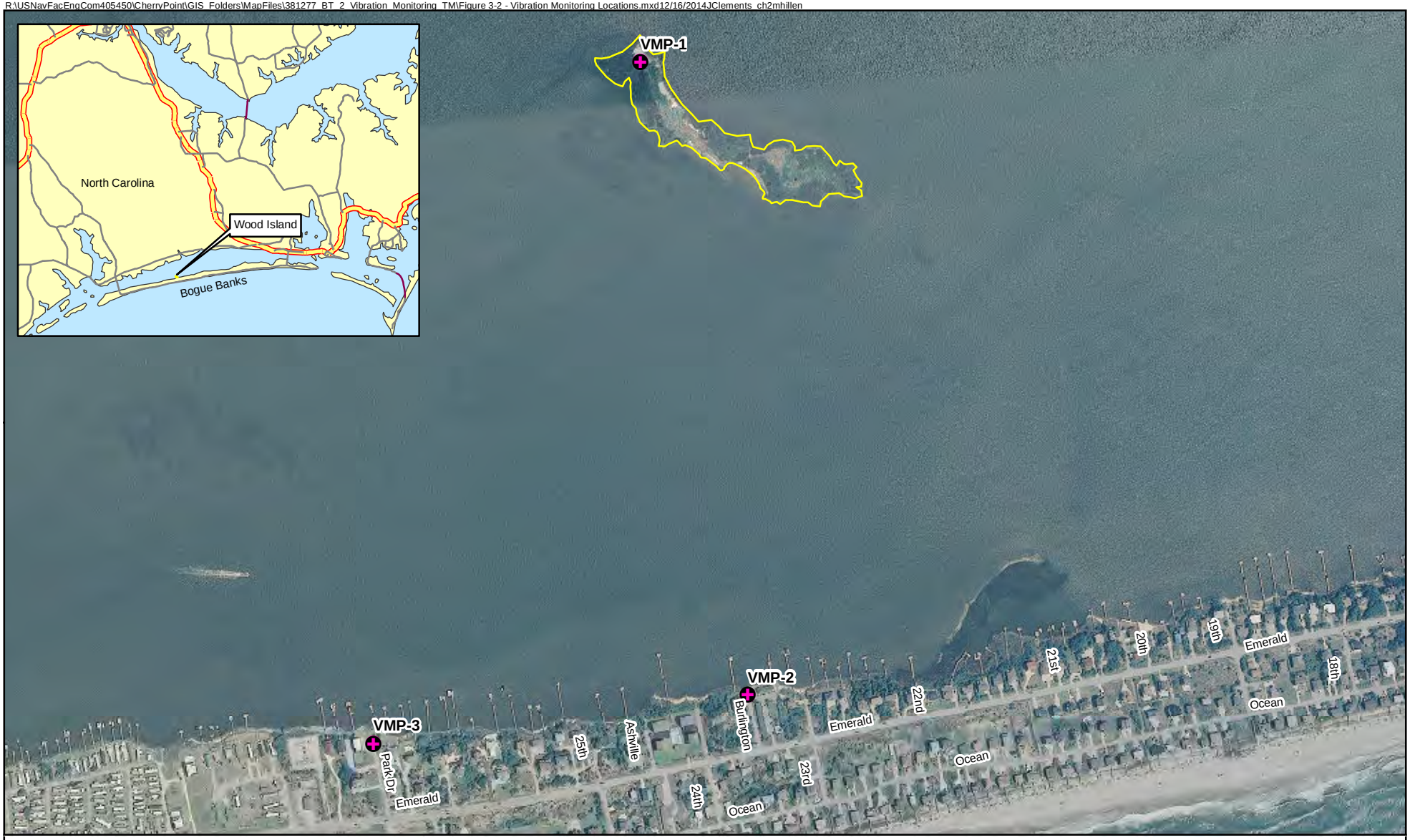
0 200 400
Feet

Figure 3-1
Wood Island Surface Removal Area
Former Cat Island Bomb Target BT-2
MCAS Cherry Point
North Carolina

Version 1, June 2014

CH2MHILL

R:\USNavFacEngCom405450\CherryPoint\GIS_Folders\MapFiles\381277_BT_2_Vibration_Monitoring_TM\Figure 3-2 - Vibration Monitoring Locations.mxd12/16/2014JClements_ch2mhillen



Legend

- VMP - Vibration Monitoring Point
- Wood Island

N
W E
S

0 500 1,000
Feet

Figure 3-2
Vibration Monitoring Locations
Former Cat Island Bomb Target BT-2
MCAS Cherry Point
North Carolina

CH2MHILL

SECTION 4

Analytical Results

4.1 Post-Detonation Soil Analytical Results

Post-detonation surface soil analytical data were screened against the North Carolina Hazardous Waste Site Soil Screening Levels (NC HWS SSLs) (NCDENR, 2014) and the USEPA residential soil Regional Screening Levels (RSLs) (USEPA, 2014). The NC HWS SSLs represent soil concentration thresholds deemed to be protective of groundwater based on a conservative analytical model of leaching from overlying soil into underlying groundwater. The USEPA RSLs represent screening levels for potential human health risk from direct exposure to soil. The soil analytical data were also screened against the Marine Corps Installations East-Marine Corp Base Camp Lejeune (MCIE-MCB CAMLEJ) (CH2M HILL, 2011) and MCAS Cherry Point background concentrations (Tetra Tech, 1999).

Further discussion of surface soil analytical results is presented in Sections 5 and 6, HHRS and ERS, respectively. A summary of the analytical results is presented in **Table 4-1** as well as below:

- Explosives residues and perchlorate were not detected in any of the surface soil samples.
- A total of 18 metals were detected in the surface soil samples. Arsenic, chromium, and iron exceeded either the USEPA NC HWS SSLs or USEPA RSLs, but did not exceed the MCAS Cherry Point and MCIE-MCB CAMLEJ background concentrations.

TABLE 4-1

Post-Detonation Surface Soil Analytical Results

Expanded Site Inspection Report Former Cat Island Bomb Target BT-2

MCAS Cherry Point, North Carolina

Station ID	Cherry Point Average Background Concentration - Soil	NCSSL (February 2012)	RSLs Residential Soil Adjusted (May 2014)	Camp Lejeune Background Undeveloped SS Combined Soil Types (August 2011)	BT2-SS01		BT2-DU01		
Sample ID					BT2-SS01-14A	BT2-SS01D-14A	BT2-SS02-14A	BT2-SS03-14A	BT2-SS04-14A
Sample Date					03/21/14	03/21/14	03/21/14	03/21/14	03/21/14
Chemical Name									
Semivolatile Organic Compounds (µg/kg)									
No Detections									
Explosives (µg/kg)									
No Detections									
Total Metals (mg/kg)									
Aluminum	10,160	--	7,700	12,800	506 J	493 J	429 J	424 J	516 J
Arsenic	3.9	5.8	0.67	1.17	**1.27**	**1.26**	1.13	**1.37**	**1.47**
Barium	23	580	1,500	36.7	2.5 J	2.64 J	2.99	2.26 J	2.88 J
Beryllium	0.44	63	16	0.195	0.159 U	0.147 U	0.13 U	0.13 U	0.0777 J
Cadmium	1.12	3	7	0.2	0.157 J	0.179 J	0.164 J	0.134 J	0.129 J
Calcium	512	--	--	8,470	**14,300**	**13,700**	5,350	**10,300**	**9,270**
Chromium	17.0	3.8	0.3	17.4	4.94	4.79	3.87	3.97	4.63
Cobalt	2.38	0.9	2.3	0.414	0.795 U	0.373 J	0.651 U	0.649 U	0.764 U
Copper	3.76	700	310	17.1	2.3 J	2.72 J	3.18 J	2.79 J	2.86 J
Iron	5,960	150	5,500	7,210	1,670	1,700	1,360	1,420	1,760
Lead	10.5	270	400	27.5	2.28	3.23	12.5	4.44	2.55
Magnesium	422	--	--	904	335 J	332 J	176 J	224 J	209 J
Manganese	16.7	65	180	37	9.87	10.5	7.47	7.56	11
Nickel	6.9	130	150	3.11	0.829	1.01	0.473 J	0.516 J	0.631 J
Potassium	482	--	--	359	82.2 J	80.1 J	69.3 J	67.6 J	77.2 J
Sodium	51	--	--	250	208 J	189 J	224 J	203 J	247 J
Vanadium	19.2	6	39	17.6	2.05	2.08	1.69	1.9	2.15
Zinc	11.3	1,200	2,300	28.6	24.6	**30**	15.7	11.9	17.1

Notes:

Shading indicates exceedance of the Cherry Point average background concentration in soil

Bold box indicates exceedance of NCSSL

Underline indicates exceedance of Adjusted Residential Soil RSLs

Bold text indicates exceedance of Camp Lejeune Background for surface soil (combined soil types)

J - Analyte present, value may or may not be accurate or precise

U - The material was analyzed for, but not detected

mg/kg - Milligrams per kilogram

µg/kg - Micrograms per kilogram

SECTION 5

Human Health Risk Screening

An HHRS was performed to assess the potential for human health risks associated with exposure to surface soil within the controlled detonation area at BT-2. The results of the HHRS provide a preliminary indication of potential risks from exposure to chemicals detected in the soil, and are used to help evaluate whether future unrestricted (i.e., residential) use of this area would be acceptable after the controlled detonation operations or if further evaluation is required (e.g., additional risk assessment or data collection).

5.1 Data Evaluation

The validated analytical data evaluated in the HHRS included four surface soil samples collected in March 2014. These samples were analyzed for explosives, perchlorate, and total metals. The soil analytical data are presented in **Table 4-1.** A review of the data identified the following criteria for data usability:

- Estimated values flagged with a J qualifier were treated as detected concentrations
- For duplicate samples, the maximum concentration between the primary and duplicate sample was used as the sample concentration

5.2 Risk Screening Approach

The HHRS was conducted in two steps using a risk ratio technique (Navy, 2000). Constituents of potential concern (COPCs) identified in Step 1 were evaluated further in Step 2.

5.2.1 Step 1

The maximum detected concentrations in soil were compared to the USEPA residential soil RSLs (USEPA, 2014). Residential soil RSLs are more conservative (i.e., lower) than industrial soil RSLs, and are therefore protective of all potential receptors (e.g., military personnel, trespassers/visitors, residents, industrial workers, construction workers). RSLs based on non-carcinogenic effects were based on a hazard quotient (HQ) of 0.1 to account for exposure to multiple constituents. RSLs based on carcinogenic endpoints were based on a carcinogenic risk of 1×10^{-6}. If the maximum detected concentration of an analyte in soil exceeded the RSL, the screening level risk evaluation for that analyte proceeded to Step 2.

Surface soil background threshold values for undeveloped combined soil types from MCIE-MCB CAMLEJ (CH2M HILL, 2011) and two times the mean concentrations of the background soil samples for MCAS Cherry Point (Tetra Tech, 1999) are included on the Step 1 screening table, since MCAS Cherry Point and MCIE-MCB CAMLEJ are within 14 miles of BT-2 and have similar soil types, and site-specific background data are not available. However, the background concentrations were not used to identify COPCs, but were used to aid in risk management decision making, if necessary (i.e., if an analyte was identified as a COPC, but was below the background value, this would be considered in the final discussion of site-related risks).

The Federal Remediation Branch Target Screening Values for protection of groundwater (NCSSLs) (NCDENR, 2014) are also shown on the Step 1 soil screening table; however, they were not used to identify COPCs, but were used to indicate the potential for leaching from the soil to groundwater at concentrations of potential concern to human receptors.

In addition to comparing the detected concentrations to the screening levels, the detection limits for non-detected analytes were compared to the screening levels. Non-detected analytes with detection limits exceeding the screening level were not identified as COPCs to carry forward to Step 2, but are discussed to evaluate the potential for underestimating the total risks.

5.2.2 Step 2

For analytes identified as COPCs in Step 1, a corresponding risk level was calculated using the following equation:

$$\text{corresponding risk level} = \frac{\text{concentration x acceptable risk level}}{\text{RSL}}$$

The concentration is the maximum detected concentration (the same concentration that was used in Step 1). The acceptable risk level is 1 for noncarcinogens and 10^{-6} for carcinogens. RSLs for noncarcinogens are based on a hazard quotient of 1, instead of the hazard quotient of 0.1 used in Step 1.

The corresponding risk levels for each analyte were summed to calculate the cumulative corresponding carcinogenic risk (for carcinogens) and cumulative corresponding hazard index (HI, for noncarcinogens). If the cumulative corresponding carcinogenic risk is greater than 5×10^{-5}, or the cumulative corresponding HI for a target organ/effect is greater than 0.5, the anayltes contributing to these values are identified as COPCs.

5.3 Human Health Risk Screening Results

The risk-based screening and risk ration evaluation for surface soil are presented in **Tables 5-1 and 5-2**. As indicated in **Table 5-1,** arsenic and chromium (based on the assumption that all detected chromium is hexavalent chromium) were identified as COPCs for evaluation in Step 2. Neither arsenic nor chromium were identified as COPCs in Step 2 (**Table 5-2**).

Thallium was the only analyte that was not detected in surface soil but had a detection limit exceeding the screening value. However, the detection limit only slightly exceeds (within ten times) the residential soil RSL, based on an HQ of 0.1, and does not exceed the RSL based on an HQ of 1. Therefore, it is not expected that thallium would be present in soil at concentrations contributing to unacceptable risks.

The maximum detected concentrations of two analytes, chromium and iron, were above the NCSSL. The total chromium concentrations were conservatively compared to the NCSSL for hexavalent chromium. The total chromium concentrations were within one order of magnitude of the hexavalent chromium NCSSL and below the trivalent chromium NCSSL. It is unlikely all detected chromium would be hexavalent chromium, and likely that actual concentrations of hexavalent chromium would be below the NCSSL. Although detected concentrations of iron exceeded the NCSSL, iron is an essential human nutrient, and it is likely any concentrations in groundwater associated with leaching from soil would not result in adverse health effects. Additionally, both chromium and iron were detected in the surface soil at concentrations below the background concentrations.

Therefore, exposure to surface soil associated with post-detonation activities is not expected to result in any unacceptable human health risks, and no further evaluation of surface soil is required based on potential human exposures and risks.

TABLE 5-1

Occurrence, Distribution and Selection Of Chemicals Of Potential Concern

Expanded Site Inspection Report Former Cat Island Bomb Target BT-2

MCAS Cherry Point, North Carolina

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening [2]	Background Value [3]	Background Value [4]	Screening Toxicity Value [5]	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection [6]
Surface Soil	99-35-4	1,3,5-Trinitrobenzene	ND	ND	MG/KG		0/4	1.8E-01 - 1.9E-01	1.9E-01	N/A	N/A	2.2E+02 N	N/A		NO	DLBSL
	99-65-0	1,3-Dinitrobenzene	ND	ND	MG/KG		0/4	1.8E-01 - 1.9E-01	1.9E-01	N/A	N/A	6.2E-01 N	N/A		NO	DLBSL
	118-96-7	2,4,6-Trinitrotoluene	ND	ND	MG/KG		0/4	1.8E-01 - 1.9E-01	1.9E-01	N/A	N/A	3.6E+00 N	N/A		NO	DLBSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	MG/KG		0/4	1.8E-01 - 1.9E-01	1.9E-01	N/A	N/A	1.7E+00 C	1.6E-03	NCSSL	NO	DLBSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	MG/KG		0/4	1.8E-01 - 1.9E-01	1.9E-01	N/A	N/A	3.6E-01 C	N/A		NO	DLBSL
	35572-78-2	2-Amino-4,6-dinitrotoluene	ND	ND	MG/KG		0/4	1.8E-01 - 1.9E-01	1.9E-01	N/A	N/A	1.5E+01 N	N/A		NO	DLBSL
	88-72-2	2-Nitrotoluene	ND	ND	MG/KG		0/4	1.8E-01 - 1.9E-01	1.9E-01	N/A	N/A	3.2E+00 C	N/A		NO	DLBSL
	99-08-1	3-Nitrotoluene	ND	ND	MG/KG		0/4	1.8E-01 - 1.9E-01	1.9E-01	N/A	N/A	6.2E-01 N	N/A		NO	DLBSL
	19406-51-0	4-Amino-2,6-dinitrotoluene	ND	ND	MG/KG		0/4	1.8E-01 - 1.9E-01	1.9E-01	N/A	N/A	1.5E+01 N	N/A		NO	DLBSL
	99-99-0	4-Nitrotoluene	ND	ND	MG/KG		0/4	1.8E-01 - 1.9E-01	1.9E-01	N/A	N/A	2.5E+01 N	N/A		NO	DLBSL
	2691-41-0	HMX	ND	ND	MG/KG		0/4	1.8E-01 - 1.9E-01	1.9E-01	N/A	N/A	3.8E+02 N	N/A		NO	DLBSL
	98-95-3	Nitrobenzene	ND	ND	MG/KG		0/4	1.8E-01 - 1.9E-01	1.9E-01	N/A	N/A	5.1E+00 C	N/A		NO	DLBSL
	55-63-0	Nitroglycerin	ND	ND	MG/KG		0/4	4.4E-01 - 4.8E-01	4.8E-01	N/A	N/A	6.2E-01 N	N/A		NO	DLBSL
	14797-73-0	Perchlorate	ND	ND	MG/KG		0/4	1.1E-02 - 1.4E-02	1.4E-02	N/A	N/A	5.5E+00 N	N/A		NO	DLBSL
	78-11-5	PETN	ND	ND	MG/KG		0/4	4.4E-01 - 4.8E-01	4.8E-01	N/A	N/A	1.2E+01 N	N/A		NO	DLBSL
	121-82-4	RDX	ND	ND	MG/KG		0/4	1.8E-01 - 1.9E-01	1.9E-01	N/A	N/A	6.0E+00 C	N/A		NO	DLBSL
	479-45-8	Tetryl	ND	ND	MG/KG		0/4	1.8E-01 - 1.9E-01	1.9E-01	N/A	N/A	1.2E+01 N	N/A		NO	DLBSL
	7429-90-5	Aluminum	4.2E+02	5.2E+02 J	MG/KG	BT2-SS04-14A	4/4	6.5E+00 - 8.0E+00	5.2E+02	1.3E+04	1.0E+04	7.7E+03 N	N/A		NO	BSL
	7440-36-0	Antimony	ND	ND	MG/KG		0/4	5.2E-01 - 6.4E-01	6.4E-01	1.9E+00	ND	3.1E+00 N	9.0E-01	NCSSL	NO	DLBSL
	7440-38-2	**Arsenic**	**1.1E+00**	**1.5E+00**	**MG/KG**	**BT2-SS04-14A**	4/4	**3.9E-01 - 4.8E-01**	**1.5E+00**	**1.2E+00**	**3.9E+00**	**6.7E-01 C**	**5.8E+00**	**NCSSL**	**YES**	**ASL**
	7440-39-3	Barium	2.3E+00 J	3.0E+00	MG/KG	BT2-SS02-14A	4/4	6.5E-01 - 8.0E-01	3.0E+00	3.7E+01	2.3E+01	1.5E+03 N	5.8E+02	NCSSL	NO	BSL
	7440-41-7	Beryllium	7.8E-02 J	7.8E-02 J	MG/KG	BT2-SS04-14A	1/4	1.3E-01 - 1.6E-01	7.8E-02	2.0E-01	4.4E-01	1.6E+01 N	6.3E+01	NCSSL	NO	BSL
	7440-43-9	Cadmium	1.3E-01 J	1.8E-01 J	MG/KG	BT2-SS01D-14A	4/4	1.3E-01 - 1.6E-01	1.8E-01	2.0E-01	1.1E+00	7.0E+00 N	3.0E+00	NCSSL	NO	BSL
	7440-70-2	Calcium	5.4E+03	1.4E+04	MG/KG	BT2-SS01-14A	4/4	1.3E+02 - 1.6E+02	1.4E+04	8.5E+03	5.1E+02	N/A	N/A		NO	NUT
	7440-47-3	**Chromium**	**3.9E+00**	**4.9E+00**	**MG/KG**	**BT2-SS01-14A**	**4/4**	**2.6E-01 - 3.2E-01**	**4.9E+00**	**1.7E+01**	**1.7E+01**	**3.0E-01 C**	**3.8E+00**	**NCSSL**	**YES**	**ASL**
	7440-48-4	Cobalt	3.7E-01 J	3.7E-01 J	MG/KG	BT2-SS01D-14A	1/4	6.5E-01 - 8.0E-01	3.7E-01	4.1E-01	2.4E+00	2.3E+00 N	9.0E-01	NCSSL	NO	BSL
	7440-50-8	Copper	2.7E+00 J	3.2E+00 J	MG/KG	BT2-SS02-14A	4/4	5.2E-01 - 6.4E-01	3.2E+00	1.7E+01	3.8E+00	3.1E+02 N	7.0E+02	NCSSL	NO	BSL
	7439-89-6	Iron	1.4E+03	1.8E+03	MG/KG	BT2-SS04-14A	4/4	3.9E+00 - 4.8E+00	1.8E+03	7.2E+03	6.0E+03	5.5E+03 N	1.5E+02	NCSSL	NO	BSL
	7439-92-1	Lead	2.6E+00	1.3E+01	MG/KG	BT2-SS02-14A	4/4	1.9E-01 - 2.4E-01	1.3E+01	2.8E+01	1.1E+01	4.0E+02 NL	2.7E+02	NCSSL	NO	BSL
	7439-95-4	Magnesium	1.8E+02 J	3.4E+02 J	MG/KG	BT2-SS01-14A	4/4	2.0E+02 - 2.4E+02	3.4E+02	9.0E+02	4.2E+02	N/A	N/A		NO	NUT
	7439-96-5	Manganese	7.5E+00	1.1E+01	MG/KG	BT2-SS04-14A	4/4	3.9E-01 - 4.8E-01	1.1E+01	3.7E+01	1.7E+01	1.8E+02 N	6.5E+01	NCSSL	NO	BSL
	7439-97-6	Mercury	ND	ND	MG/KG		0/4	3.0E-02 - 4.4E-02	4.4E-02	1.6E-01	1.2E-01	2.3E+00 N	1.0E+00	NCSSL	NO	DLBSL
	7440-02-0	Nickel	4.7E-01 J	1.0E+00	MG/KG	BT2-SS01D-14A	4/4	3.9E-01 - 4.8E-01	1.0E+00	3.1E+00	6.9E+00	1.5E+02 N	1.3E+02	NCSSL	NO	BSL
	7440-09-7	Potassium	6.8E+01 J	8.2E+01 J	MG/KG	BT2-SS01-14A	4/4	2.0E+02 - 2.4E+02	8.2E+01	3.6E+02	4.8E+02	N/A	N/A		NO	NUT
	7782-49-2	Selenium	ND	ND	MG/KG		0/4	3.3E-01 - 4.0E-01	4.0E-01	1.6E+00	5.6E-01	3.9E+01 N	2.1E+00	NCSSL	NO	DLBSL
	7440-22-4	Silver	ND	ND	MG/KG		0/4	1.3E-01 - 1.6E-01	1.6E-01	3.5E-01	8.2E-01	3.9E+01 N	3.4E+00	NCSSL	NO	DLBSL
	7440-23-5	Sodium	2.0E+02 J	2.5E+02 J	MG/KG	BT2-SS04-14A	4/4	2.0E+02 - 2.4E+02	2.5E+02	2.5E+02	5.1E+01	N/A	N/A		NO	NUT
	7440-28-0	Thallium	ND	ND	MG/KG		0/4	2.9E-01 - 4.0E-01	4.0E-01	N/A	9.6E-01	7.8E-02 N	2.8E-01	NCSSL	YES	DLASL
	7440-62-2	Vanadium	1.7E+00	2.2E+00	MG/KG	BT2-SS04-14A	4/4	6.5E-01 - 8.0E-01	2.2E+00	1.8E+01	1.9E+01	3.9E+01 N	6.0E+00	NCSSL	NO	BSL
	7440-66-6	Zinc	1.2E+01	3.0E+01	MG/KG	BT2-SS01D-14A	4/4	6.5E-01 - 8.0E-01	3.0E+01	2.9E+01	1.1E+01	2.3E+03 N	1.2E+03	NCSSL	NO	BSL

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening. If chemical was not detected, the maximum detection limit is used for screening.

[3] Background values are MCB CamLej Background Surface Soil, Undeveloped Combined Soil Types since Cat Island within 14 miles of MCB CamLej.
Background values not used to identify COPCs, they will be used in risk management decisions.

[4] Background values are Cherry Point background soil values, two times the mean background soil concentration, from Background Evaluation Report Marine Corps Air Station, Cherry Point, North Carolina, TetraTech NUS, Inc., 1999.
Background values not used to identify COPCs, they will be used in risk management decisions.

[5] Oak Ridge National Laboratory (ORNL). May, 2014. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Residential soil RSL.
RSL based on noncarcinogenic endpoints based on hazard quotient of 0.1. RSL based on carcinogenic endpoints based on cancer risk of 10-6.
RSL value for chromium (VI) used for chromium.
RSL value for mercuric chloride (and other mercury salts) used for mercury.

[6] Rationale Codes

Selection Reason: Above Screening Levels (ASL)
Detection Limit Above Screening Level (DLASL), not quantitatively evaluated in HHRA

Deletion Reason: Below Screening Level (BSL)
Detection Limit Below Screening Level (DLBSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
C = Carcinogenic
N = Noncarcinogenic
NL = Noncarcinogenic lead soil RSL from IEUBK Lead model.
MG/KG = Milligram per kilogram
RSL = Regional Screening Level
NCSSL = North Carolina NCSSL = North Carolina Preliminary Soil Remediation Goal, Protection of Groundwater, January 2014
ND = Not detected
N/A = Not available

TABLE 5-2

Risk Ratio Screening for Surface Soil, Maximum Detected Concentration

Expanded Site Inspection Report Former Cat Island Bomb Target BT-2

MCAS Cherry Point, North Carolina

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier)	Sample Location of Maximum Detected Concentration	Carcinogenic Residential Soil RSL	Acceptable Risk Level	Corresponding Cancer Risk[a]	Non-carcinogenic Residential Soil RSL	Acceptable Hazard Level	Corresponding Hazard Index[b]	Target Organ
Metals (mg/kg)										
Arsenic	4 / 4	1.5E+00	BT2-SS04-14A	6.7E-01	1E-06	2E-06	3.4E+01	1	0.04	Skin, Blood
Chromium[e]	4 / 4	4.9E+00	BT2-SS01-14A	3.0E-01	1E-06	2E-05	2.3E+02	1	0.02	None Reported
Cumulative Corresponding Hazard Index[c]									**0.06**	
Cumulative Corresponding Cancer Risk[d]						**2E-05**				
									Total Skin HI =	0.04
									Total Blood HI =	0.04

Notes:

[a] Corresponding Cancer Risk equals maximum detected concentration divided by the RSL divided by the acceptable risk level.

[b] Corresponding Hazard Index equals maximum detected concentration divided by the RSL divided by the acceptable risk level.

[c] Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.

[d] Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

[e] RSL value for chromium (VI) used for chromium.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.
Constituents selected as COPCs are indicated by shading.
COPC = Constituent of Potential Concern
HI = Hazard Index
mg/kg = milligrams per kilogram
N/A = Not available/not applicable

SECTION 6

Ecological Risk Screening

An ERS was performed to assess the potential risks to ecological receptors associated with exposure to surface soil within the controlled detonation area at BT-2. The results of the ERS were used to help evaluate current conditions and determine if further evaluation (e.g., additional risk assessment or data collection) is warranted.

6.1 Methodology

6.1.1 Available Data

The validated analytical data evaluated in the ERS included four surface soil samples collected in March 2014 (**Figure 3-1**). These samples were analyzed for explosives, perchlorate, and total metals. A complete summary of the data from these samples is presented in **Table 4-1**. A review of the data identified the following criteria for data usability:

- Estimated values flagged with a J qualifier were treated as detected concentrations
- For duplicate samples, the maximum concentration between the primary and duplicate sample was used as the sample concentration

For this surface soil dataset, none of the explosive constituents were detected. A total of 13 of 18 metals were detected in soil. Of those, 11 metals were detected in all four samples. The other two metals were detected in one of four samples.

6.1.2 Ecological Screening Values

Constituent-specific surface soil concentrations were compared to Ecological Screening Values (ESVs). ESVs are intended to be protective of lower trophic level (soil invertebrates, terrestrial plants) and/or upper trophic level (birds and mammals) ecological receptors. The ESVs used in this ERS were identified from various sources from the scientific literature. All ESV sources are indicated in the screening table (**Table 6-1**). The only detected constituents for these surface soil samples were metals. The primary source of metals ESVs was USEPA Ecological Soil Screening Levels (EcoSSLs). Some EcoSSLs represent both lower and upper trophic level receptors. For this ERS, the lowest metal-specific EcoSSL was used as the ESV. This approach conservatively addresses the range of receptors expected to utilize the site.

ESVs were unavailable for three constituents, PETN, aluminum and iron. For PETN, the inability to screen is an uncertainty that is low given the analyte was not detected. For aluminum and iron, both of which were detected in all four samples, the EcoSSLs are based on site-specific soil pH rather than a particular concentration of these constituents in surface soil (USEPA, 2003a and 2003b). According to the aluminum EcoSSL narrative, aluminum should only be considered a COPC at sites where it is detected and soil pH is below 5.5 (USEPA, 2003a). Similarly, the iron EcoSSL narrative states that detected iron is not expected to be toxic when soil pH is between 5 and 8 (USEPA, 2003b). However, soil pH was not analyzed in these surface soil samples. Regardless, the concentrations detected at BT-2 are most likely naturally occurring. According to Buchman (2008), concentrations of aluminum and iron at BT-2 are below the average mean background concentrations of 4.7 percent and 1.8 percent, respectively.

6.1.3 Screening

The HQ method was used for screening and identifying COPCs. Using the HQ method, site-specific exposure point concentrations (EPCs) were calculated for detected constituents. For this dataset, the EPCs included both maximum and mean concentrations. These EPCs were divided by the ESVs to calculate an HQ. Constituents with HQs greater than 1.0 were identified as ecological COPCs, warranting further consideration.

Screening included both detect and non-detect values. For constituents that were undetected in all samples, the maximum non-detect value was used as a surrogate concentration for screening. When calculating mean concentrations, one-half the non-detect value was used. For the location where a duplicate sample was collected (BT2-SS01), the greatest detected concentration or greatest detection limit, if there was no detection, was used.

6.2 Ecological Risk Screening Results

A summary of the comparison of constituent-specific surface soil concentrations to ESVs is provided in **Table 6-2**. For explosives residues, none of the reporting limits exceeded available screening values. Therefore, no unacceptable risk is expected from explosives residues at BT-2.

For undetected metals, the maximum and mean EPCs for antimony (based on non-detect values) exceeded the ESV. This ESV is the EcoSSL for mammals and neither EPC exceeds the soil invertebrate ESV (78 milligrams per kilogram). Therefore, based on the fact that it was undetected and does not exceed the lower trophic level ESV, antimony is not expected to pose unacceptable risk.

For detected metals, only the maximum lead concentration exceeded the ESV. However, the mean EPC did not exceed the ESV. Therefore, lead is also not expected to pose an unacceptable risk.

Based on the results of the ERS, no further action is warranted for BT-2 related to activities in the controlled detonation area.

TABLE 6-1

Ecological Risk Screening Surface Soil Detections

Expanded Site Inspection Report Former Cat Island Bomb Target BT-2

MCAS Cherry Point, North Carolina

Constituent	BT2-SS01		BT2-SS02	BT2-SS03	BT2-SS04
	BT2-SS01-14A	BT2-SS01D-14A	BT2-SS02-14A	BT2-SS03-14A	BT2-SS04-14A
	3/21/14	Duplicate	3/21/14	3/21/14	3/21/14
Explosives (mg/kg)					
1,3,5-Trinitrobenzene	179 U	199 U	176 U	188 U	191 U
1,3-Dinitrobenzene	179 U	199 U	176 U	188 U	191 U
2,4,6-Trinitrotoluene	179 U	199 U	176 U	188 U	191 U
2,4-Dinitrotoluene	179 U	199 U	176 U	188 U	191 U
2,6-Dinitrotoluene	179 U	199 U	176 U	188 U	191 U
2-Amino-4,6-dinitrotoluene	179 U	199 U	176 U	188 U	191 U
2-Nitrotoluene	179 U	199 U	176 U	188 U	191 U
3-Nitrotoluene	179 U	199 U	176 U	188 U	191 U
4-Amino-2,6-dinitrotoluene	179 U	199 U	176 U	188 U	191 U
4-Nitrotoluene	179 U	199 U	176 U	188 U	191 U
HMX	179 U	199 U	176 U	188 U	191 U
Nitrobenzene	179 U	199 U	176 U	188 U	191 U
Nitroglycerin	446 U	498 U	441 U	469 U	478 U
Perchlorate	13.5 U	12 U	13.2 U	12.7 U	11.1 U
PETN	446 U	498 U	441 U	469 U	478 U
RDX	179 U	199 U	176 U	188 U	191 U
Tetryl	179 U	199 U	176 U	188 U	191 U
Total Metals (mg/kg)					
Aluminum	506 J	493 J	429 J	424 J	516 J
Antimony	0.636 U	0.588 U	0.521 U	0.519 U	0.612 U
Arsenic	1.27	1.26	1.13	1.37	1.47
Barium	2.5 J	2.64 J	2.99	2.26 J	2.88 J
Beryllium	0.159 U	0.147 U	0.13 U	0.13 U	0.0777 J
Cadmium	0.157 J	0.179 J	0.164 J	0.134 J	0.129 J
Calcium	14,300	13,700	5,350	10,300	9,270
Chromium	4.94	4.79	3.87	3.97	4.63
Cobalt	0.795 U	0.373 J	0.651 U	0.649 U	0.764 U
Copper	2.3 J	2.72 J	3.18 J	2.79 J	2.86 J
Iron	1,670	1,700	1,360	1,420	1,760
Lead	2.28	3.23	12.5	4.44	2.55
Magnesium	335 J	332 J	176 J	224 J	209 J
Manganese	9.87	10.5	7.47	7.56	11
Mercury	0.0436 U	0.0397 U	0.0349 U	0.0301 U	0.0381 U
Nickel	0.829	1.01	0.473 J	0.516 J	0.631 J
Potassium	82.2 J	80.1 J	69.3 J	67.6 J	77.2 J
Selenium	0.398 U	0.368 U	0.326 U	0.325 U	0.382 U
Silver	0.159 U	0.147 U	0.13 U	0.13 U	0.153 U
Sodium	208 J	189 J	224 J	203 J	247 J
Thallium	0.398 U	0.294 U	0.326 U	0.325 U	0.382 U
Vanadium	2.05	2.08	1.69	1.9	2.15
Zinc	24.6	30	15.7	11.9	17.1

Notes:
Shaded cells indicated detections values
mg/kg - Milligrams per kilogram
mg/kg - Micrograms per kilogram
J - Analyte present. Value may or may not be accurate or precise
U - The material was analyzed for, but not detected

TABLE 6-2

Ecological Screening Value Comparisons for Surface Soil

Expanded Site Inspection Report Former Cat Island Bomb Target BT-2

MCAS Cherry Point, North Carolina

Parameter Class	Constituent	Units	Range of Non-Detect Values	Maximum Detection		Mean Concentration	Frequency of Detection	Ecological Screening Value		Frequency of Exceedance	Hazard Quotient (HQ)		Retain?	Reason
				Concentration	Location						Max	Mean		
Expolsive	1,3,5-Trinitrobenzene	mg/kg	176 - 199	--	--	94.25	0 / 4	40,000	Nitrobenzene value	-- / 4	*<0.01*	*<0.01*	No	Undetected; non-detect yeild HQ < 1.0
Expolsive	1,3-Dinitrobenzene	mg/kg	176 - 199	--	--	94.25	0 / 4	40,000	Nitrobenzene value	-- / 4	*<0.01*	*<0.01*	No	Undetected; non-detect yeild HQ < 1.0
Expolsive	2,4,6-Trinitrotoluene	mg/kg	176 - 199	--	--	94.25	0 / 4	3,700	NRCC, 2006	-- / 4	*0.05*	*0.03*	No	Undetected; non-detect yeild HQ < 1.0
Expolsive	2,4-Dinitrotoluene	mg/kg	176 - 199	--	--	94.25	0 / 4	11,000	NRCC 2006	-- / 4	*0.02*	*0.01*	No	Undetected; non-detect yeild HQ < 1.0
Expolsive	2,6-Dinitrotoluene	mg/kg	176 - 199	--	--	94.25	0 / 4	8,500	NRCC 2006	-- / 4	*0.02*	*0.01*	No	Undetected; non-detect yeild HQ < 1.0
Expolsive	2-Amino-4,6-dinitrotoluene	mg/kg	176 - 199	--	--	94.25	0 / 4	80,000	Talmage et al. 1999	-- / 4	*<0.01*	*<0.01*	No	Undetected; non-detect yeild HQ < 1.0
Expolsive	2-Nitrotoluene	mg/kg	176 - 199	--	--	94.25	0 / 4	30,000	TNT value	-- / 4	*0.01*	*<0.01*	No	Undetected; non-detect yeild HQ < 1.0
Expolsive	3-Nitrotoluene	mg/kg	176 - 199	--	--	94.25	0 / 4	30,000	TNT value	-- / 4	*0.01*	*<0.01*	No	Undetected; non-detect yeild HQ < 1.0
Expolsive	4-Amino-2,6-dinitrotoluene	mg/kg	176 - 199	--	--	94.25	0 / 4	80,000	2-amino-4,6-dinitrotoluene value	-- / 4	*<0.01*	*<0.01*	No	Undetected; non-detect yeild HQ < 1.0
Expolsive	4-Nitrotoluene	mg/kg	176 - 199	--	--	94.25	0 / 4	30,000	TNT value	-- / 4	*0.01*	*<0.01*	No	Undetected; non-detect yeild HQ < 1.0
Expolsive	HMX	mg/kg	176 - 199	--	--	94.25	0 / 4	10,000	Talmage et al. 1999	-- / 4	*0.02*	*0.01*	No	Undetected; non-detect yeild HQ < 1.0
Expolsive	Nitrobenzene	mg/kg	176 - 199	--	--	94.25	0 / 4	40,000	Efroymson et al. 1997a	-- / 4	*<0.01*	*<0.01*	No	Undetected; non-detect yeild HQ < 1.0
Expolsive	Nitroglycerin	mg/kg	441 - 498	--	--	235.75	0 / 4	65,000	NRCC, 2006	-- / 4	*0.01*	*<0.01*	No	Undetected; non-detect yeild HQ < 1.0
Expolsive	Perchlorate	mg/kg	11.1 - 13.5	--	--	6.3125	0 / 4	1,000	USEPA 2002	-- / 4	*0.01*	*0.01*	No	Undetected; non-detect yeild HQ < 1.0
Expolsive	PETN	mg/kg	441 - 498	--	--	235.75	0 / 4	NSV	--	-- / 4	--	--	No	Undetected
Expolsive	RDX	mg/kg	176 - 199	--	--	94.25	0 / 4	4,700	NRCC, 2006	-- / 4	*0.04*	*0.02*	No	Undetected; non-detect yeild HQ < 1.0
Expolsive	Tetryl	mg/kg	176 - 199	--	--	94.25	0 / 4	25,000	Talmage et al., 1999	-- / 4	*0.01*	*<0.01*	No	Undetected; non-detect yeild HQ < 1.0
Metals	Aluminum	mg/kg	-- - --	516	BT2-SS02-14A	469	4 / 4	pH <5.5	USEPA 2003a	-- / 4	--	--	No	No soil pH; concentrations with range of expected background
Metals	Antimony	mg/kg	0.519 - 0.636	--	--	0.286	0 / 4	0.27	USEPA 2005a	0 / 4	***2.4***	***1.1***	No	Undetected; mammal ESV; soil invertebrate ESV not exceeded
Metals	Arsenic	mg/kg	-- - --	1.47	BT2-SS04-14A	1.31	4 / 4	18	USEPA 2005b	0 / 4	0.1	0.1	No	HQs < 1.0
Metals	Barium	mg/kg	-- - --	2.99	BT2-SS02-14A	2.69	4 / 4	330	USEPA 2005c	0 / 4	0.01	0.01	No	HQs < 1.0
Metals	Beryllium	mg/kg	0.13 - 0.159	0.0777	BT2-SS02-14A	0.07	1 / 4	21	USEPA 2005d	0 / 4	<0.01	<0.01	No	HQs < 1.0
Metals	Cadmium	mg/kg	-- - --	0.179	BT2-SS01D-14A	0.152	4 / 4	0.36	USEPA 2005e	0 / 4	0.5	0.4	No	HQs < 1.0
Metals	Chromium	mg/kg	-- - --	4.94	BT2-SS01-14A	4.35	4 / 4	26	USEPA 2008	0 / 4	0.2	0.2	No	HQs < 1.0
Metals	Cobalt	mg/kg	0.649 - 0.795	0.373	BT2-SS01D-14A	0.35	1 / 4	13	USEPA 2005f	0 / 4	0.03	0.03	No	HQs < 1.0
Metals	Copper	mg/kg	-- - --	3.18	BT2-SS02-14A	3	4 / 4	28	USEPA 2007a	0 / 4	0.1	0.1	No	HQs < 1.0
Metals	Iron	mg/kg	-- - --	1,760	BT2-SS04-14A	1,560	4 / 4	pH 5-8	USEPA 2003b	-- / 4	--	--	No	No soil pH; concentrations with range of expected background
Metals	Lead	mg/kg	-- - --	12.5	BT2-SS02-14A	5.68	4 / 4	11	USEPA 2005g	0 / 4	**1.1**	0.5	No	Only 1 exceedance; Mean HQ < 1.0
Metals	Manganese	mg/kg	-- - --	11	BT2-SS04-14A	8.98	4 / 4	220	USEPA 2007b	1 / 4	0.1	0.04	No	HQs < 1.0
Metals	Mercury	mg/kg	0.0301 - 0.0436	--	--	0.0183	0 / 4	0.1	Efroymson et al. 1997a	0 / 4	*0.4*	*0.2*	No	Undetected; non-detect yeild HQ < 1.0
Metals	Nickel	mg/kg	-- - --	1.01	BT2-SS01D-14A	0.66	4 / 4	38	USEPA 2007c	0 / 4	0.03	0.02	No	HQs < 1.0
Metals	Selenium	mg/kg	0.325 - 0.398	--	--	0.1789	0 / 4	0.52	USEPA 2007d	0 / 4	*0.8*	*0.3*	No	Undetected; non-detect yeild HQ < 1.0
Metals	Silver	mg/kg	0.13 - 0.159	--	--	0.072	0 / 4	4.2	USEPA 2006	0 / 4	*0.04*	*0.02*	No	Undetected; non-detect yeild HQ < 1.0
Metals	Thallium	mg/kg	0.294 - 0.398	--	--	0.179	0 / 4	1.0	Efroymson et al. 1997b	0 / 4	*0.4*	*0.2*	No	Undetected; non-detect yeild HQ < 1.0
Metals	Vanadium	mg/kg	-- - --	2.15	BT2-SS04-14A	1.96	4 / 4	7.8	USEPA 2005h	0 / 4	0.3	0.3	No	HQs < 1.0

Notes:

Shaded/italicized HQs are based on non-detect values

Bolded HQs are >1.0

mg/kg - milligrams per kilogram

mg/kg - micrograms per kilogram

J - Analyte present. Value may or may not be accurate or precise

U - The material was analyzed for, but not detected

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SECTION 7

Conclusions and Recommendations

Surface removal activities performed at Wood Island in March 2014 resulted in the recovery of MPPEH and one MEC item identified as a 100-pound general purpose bomb. The MPPEH items were inspected and documented as MDAS and the MEC item was destroyed by controlled detonation on Wood Island. A total of 4,612 pounds of MDAS was shipped to Bonetti Explosives, Inc. in Columbus, Texas, for final destruction by thermal treatment. A full surface sweep was performed along exposed beach areas at low tide and all MEC/MPPEH and non-military metallic debris were removed from Wood Island. Based on the results of the recent surface removal activities, it has been observed that MEC/MPPEH is accumulating on the surface of Wood Island within the shoreline areas and within the eroding upland areas. This is consistent with MPPEH accumulation identified along the sandy shoreline areas of Wood Island in 2010.

Post-detonation surface soil sampling was performed following the controlled detonation of the 100-pound bomb on Wood Island. A total of four soil samples were collected and analyzed for munitions constituents. The post-detonation surface soil results did not identify the presence of explosives residues and perchlorate. Three metals, arsenic, chromium and iron, were detected at concentrations exceeding regulatory screening criteria, but at concentrations less than background concentrations. An HHRS and ERS were performed for the post-detonation soil data, which concluded that no unacceptable risks to human or ecological receptors are present due to the controlled detonation activities.

Vibration monitoring was performed during the controlled detonation to determine whether ground vibrations from the controlled detonation had the potential to impact nearby structures on Bogue Banks. The results of the vibration monitoring indicated that the controlled detonation did not cause vibration levels that could potentially cause structural damage to residences on Bogue Banks.

Following the 2010 surface removal, MEC and MPPEH continued to accumulate on the surface of Wood Island, which necessitated the 2014 surface removal. It is assumed that MEC and MPEEH will continue to accumulate on Wood Island due to continuing erosion and wave action. Therefore, it is recommended that periodic inspections be conducted in the future to assess the presence of MEC and MPPEH on Wood Island and to determine whether additional surface removals are necessary.

SECTION 8

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Appendix A
MDAS Documentation

June 18, 2014 Invoice # 3103

Mr. George Mackanin
American EOD Services, Inc.
P.O. Box 1237
Spearfish, South Dakota 57783-1237

Re: MDAS sent from Cat Island (BT-2), MCALF Bogue, NC by USAE/CH2MHILL

Mr. Mackanin,

This letter is to verify that Bonetti Explosives, LLC has smelted and prepared for recycling, in the presence of a CH2MHILL representative, nine (9) drums weighing 4,612 lbs of MDAS which was sent on April 15, 2014. The contents of the container was not sold, traded or otherwise given to another party until the contents were properly prepared for recycle and only identifiable by their basic content. On June 12, 2014, the material was dispositioned into civilian recycling in accordance with EM 1110-1-4009; this is your final letter regarding this matter.

Thank you for your Business,

Gina Barnett

Gina Barnett

(979) 739-5597

P.O. Box 116, Columbus TX, 78934 (979) 739-5597
www.Bonettiexplosives.com Bonetti4@yahoo.com

FREIGHT CHARGES ARE PREPAID ON THIS BILL OF LADING UNLESS MARKED COLLECT

OLD DOMINION FREIGHT LINE, INC

PHONE: 800-432-6335 WEB: www.odfl.com

INTERNET STRAIGHT BILL OF LADING

ORIGINAL - NOT NEGOTIABLE

Page 1 of 1

77744751536

FREIGHT CHARGES:	DATE:
Prepaid	04/04/2014

B/L# -

Pickup Reference # - 29078792

PO#:

SHIPPER
USA ENVIRONMENTAL, INC.
USMC AUX. LANDING FIELD BOGUE
BUILDING 8102
CAPE CARTERET, NC 28584
USA Ph#: 910-728-7794
JIM KEESEE

CONSIGNEE
BONETTI EXPLOSIVES, INC.
1618 SMITH RAU ROAD
COLUMBUS, TX 78934
USA Ph#: 979-739-5597
MATT BARNETT

COD
Amount:
COD Fee:

Subject to section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful changes.

(Signature of Consignor)

BILL CHARGES TO:
AMERICAN EOD SERVICES INC
PO BOX 1237
SPEARFISH, SD 57783
USA Ph#: 818-621-3689
GEORGE MACKANIN

REMIT TO (COD):

Pieces	HM	Description	Type	NMFC No.	Class	Weight (lbs)
5		MATERIAL DOCUMENTED AS SAFE (MDAS).	SKID		70	6,000
		MUNITIONS DEBRIS SCRAP METAL.				

SPECIAL INSTRUCTIONS

Rate Ref: 29078792

HAZARDOUS MATERIALS EMERGENCY CONTACT: -

Total Weight: 6,000

Total Shipping Units: 5 - Skids

Received and mutually agreed by the shipper and his assigns, any additional party with an interest to any of said property hereto and each carrier of all or any of said property over all or any portion of said route to destination, that every service to be performed hereunder shall be subject to the National Motor Freight classifications (NMF 100 Series) including the Rules, packaging and the Uniform Bill of Lading Terms and Conditions, the applicable regulations of the US Department of Transportation (DOT), the Household Goods Mileage Guides, the Carrier's tariffs, the Carrier's pricing schedules, terms, conditions and rules maintained at Carrier's general offices all of which are in effect as of the date of issue of this Bill of Lading. Carrier (Carrier being understood throughout this contract as meaning any person or corporation in possession of the property under this contract) agrees to carry to said destination if on it's route, otherwise to deliver to another carrier on the route to said destination. Carrier shall in no event be liable for loss of profit, income, interest, attorney fees, or any special, incidental or consequential damages. This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

NOTE-Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.

The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding $ _____ per _____

Carrier liability in the 48 contiguous states only: Shipments valued at more than $20.00 per pound are of extraordinary value. Carrier's maximum liability is $20.00 per pound per package subject to $50,000.00 maximum total liability per occurrence. The agreed value on household goods, used machinery, or personal effects does not exceed ten cents per pound per article, unless otherwise specified.

ACCESSORIAL SERVICES REQUESTED

SHIPPER: USA ENVIRONMENTAL, INC.

DATE: 4-4-14 H/U RECEIVED: 5 skids TRAILER NO: 403698

CARRIER: OLD DOMINION FREIGHT LINE, INC. 0056

AUTHORIZED SIGNATURE: (Shipper) James D. Keesee

AUTHORIZED SIGNATURE: (Driver) John Farr

MDAS Scrap Pallets Former Cat Island Bombing Target (BT-2)

Barrel #	Weight	Seal Number
1	705	436381
2	717	436385
3	495	436380
4	360	436383
5	280	436388
6	684	436387
7	643	436386
8	466	436389
9	735	467272

Total Weight 5085 lbs

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

1 2 3	4 5 6 7	23 24	25 26 27 28 29	45 46 47 48 49 50	51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80	1. TOTAL PRICE	2. SHIP FROM	3. SHIP TO
DOCUMENT	RI FROM	M&S	UNIT ISS	QUANTITY	SUPPLEMENTARY ADDRESS / SUPPLEMENTARY ADDRESS / SIG / FUND / DISTRIBUTION / PROJECT / PRI / REQD / DDEALTE / ADV / RI / O/P / COND / MGT	UNIT PRICE DOLLARS / CTS / DOLLARS / CTS	4. MARK FOR	

Contract: N62470-02-D-1000 CTO: 069

5. DOC DATE	6. NMFC	7. FRT RATE	8. TYPE CARGO	9. PS

10. QTY. REC'D	11.UP	12. UNIT WEIGHT	13. UNIT CUBE	14. UFC	15. SL

16. FREIGHT CLASSIFICATION NOMENCLATURE

17. ITEM NOMENCLATURE
Metal Scrap, (MDAS)

18. TY CONT	19. NO CONT	20. TOTAL WEIGHT	21. TOTAL CUBE
Drum, 55 Gal	1	705 lbs	

22. RECEIVED BY	23. DATE RECEIVED

24. DOCUMENT NUMBER & SUFFIX (30-44)

Basic Material Content: Material Documented as Safe (MDAS)

Estimate Weight (lbs): 705 lbs

Container ID No.: 1 Seal ID No.: 436381

Site address: USA Environmental, Inc.
Former Cat Island Bombing Target (BT-2)
MCALF Bogue, NC
Tel: (910) 728-7794

25. NATIONAL STOCK NO. & ADD (8-22)

Ship To: Bonetti Explosives, Inc.
Attn: Matt Barnett
1618 Smith Rau Rd
Columbus, TX 78394
Tel: (979) 739-5597

26. RIC (4-6) UI (23-24) QTY (25-29) CON CODE (71) DIST (55-56) UP (74-80)

"The material listed on this form has been inspected or processed by DDESB-approved means, as required by DOD policy, and to the best of my knowledge and belief does not pose an explosive hazard"

27. ADDITIONAL DATA

Certify By:

Jim Keesee _____ Date: 4/1/14
USA Environmental, Inc SUXOS , Tel: (910) 728-7794

Verified By:

Kevin Lombardo _____ Date: 4/1/14
CH2M Hill UXOQCS, Tel: 703-608-8247

USA Environmental, Inc., 720 Brooker Creek Boulevard, Suite 204, Oldsmar, Florida 34677, Telephone: 813.343.6336, Fax: 813.343.6377

PREVIOUS EDITION MAY BE USED

PerFORM (DLA)

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

1	2	3	4	5	6	7		23	24	25	26	27	28	29	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
DOCIT CODE		RI FROM				M&S		UNIT	ISS	QUANTITY					SER	SUPPLEMENTARY ADDRESS					SIG	FUND			DISTRIBUTION			PROJECT			PRI	REQD	DDEATE		ADV	RI			O/P	COND	MGT								

Contract: N62470-02-D-1000 CTO: 069

UNIT PRICE		DOLLARS	CTS
DOLLARS	CTS		

1. TOTAL PRICE

2. SHIP FROM

3. SHIP TO

4. MARK FOR

5. DOC DATE	6. NMFC	7. FRT RATE	8. TYPE CARGO	9. PS

10. QTY. REC'D	11.UP	12. UNIT WEIGHT	13. UNIT CUBE	14. UFC	15. SL

16. FREIGHT CLASSIFICATION NOMENCLATURE

17. ITEM NOMENCLATURE
Metal Scrap, (MDAS)

18. TY CONT	19. NO CONT	20. TOTAL WEIGHT	21. TOTAL CUBE
Drum, 55 Gal	1	717 lbs	

22. RECEIVED BY

23. DATE RECEIVED

24. DOCUMENT NUMBER & SUFFIX (30-44)

Basic Material Content: Material Documented as Safe (MDAS)

Estimate Weight (lbs): 717 lbs

Container ID No.: 2 Seal ID No.: 436385

Site address: USA Environmental, Inc.
Former Cat Island Bombing Target (BT-2)
MCALF Bogue, NC
Tel: (910) 728-7794

25. NATIONAL STOCK NO. & ADD (8-22)

Ship To: Bonetti Explosives, Inc.
Attn: Matt Barnett
1618 Smith Rau Rd
Columbus, TX 78394
Tel: (979) 739-5597

26. RIC (4-6)
UI (23-24)
QTY (25-29)
CON CODE (71)
DIST (55-56)
UP (74-80)

"The material listed on this form has been inspected or processed by DDESB-approved means, as required by DOD policy, and to the best of my knowledge and belief does not pose an explosive hazard"

27. ADDITIONAL DATA

Certify By:

Jim Keesee ~~Date:~~ 4/1/14
USA Environmental, Inc SUXOS , Tel: (910) 728-7794

Verified By:

Kevin Lombardo Date: 4/1/14
CH2M Hill UXOQCS, Tel: 703-608-8247

USA Environmental, Inc., 720 Brooker Creek Boulevard, Suite 204, Oldsmar, Florida 34677, Telephone: 813.343.6336, Fax: 813.343.6377

PREVIOUS EDITION MAY BE USED

PerFORM (DLA)

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

1	2	3	4	5	6	7	23	24	25	26	27	28	29	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
DOCIZ			RI FROM			M&S	UNIT	ISS	QUANTITY					SER	SUPPLEMENTARY ADDRESS					SIG	FUND			DISTRIBUTION			PROJECT			PRI	REQD	DELD	DATE			ADV	RI			O/P	COND	MGT							

1. TOTAL PRICE

UNIT PRICE		DOLLARS	CTS
DOLLARS	CTS		

2. SHIP FROM

3. SHIP TO

4. MARK FOR

Contract: N62470-02-D-1000 CTO: 069

5. DOC DATE	6. NMFC	7. FRT RATE	8. TYPE CARGO	9. PS

10. QTY. REC'D	11.UP	12. UNIT WEIGHT	13. UNIT CUBE	14. UFC	15. SL

16. FREIGHT CLASSIFICATION NOMENCLATURE

17. ITEM NOMENCLATURE
Metal Scrap, (MDAS)

18. TY CONT	19. NO CONT	20. TOTAL WEIGHT	21. TOTAL CUBE
Drum, 55 Gal	1	495lbs	

22. RECEIVED BY	23. DATE RECEIVED

PREVIOUS EDITION MAY BE USED

24. DOCUMENT NUMBER & SUFFIX (30-44)

Basic Material Content: Material Documented as Safe (MDAS)

Estimate Weight (lbs): 495 lbs

Container ID No.: 3 Seal ID No.: 436380

Site address: USA Environmental, Inc.
Former Cat Island Bombing Target (BT-2)
MCALF Bogue, NC
Tel: (910) 728-7794

25. NATIONAL STOCK NO. & ADD (8-22)

Ship To: Bonetti Explosives, Inc.
Attn: Matt Barnett
1618 Smith Rau Rd
Columbus, TX 78394
Tel: (979) 739-5597

26. RIC (4-6)
UI (23-24)
QTY (25-29)
CON CODE (71)
DIST (55-56)
UP (74-80)

"The material listed on this form has been inspected or processed by DDESB-approved means, as required by DOD policy, and to the best of my knowledge and belief does not pose an explosive hazard"

27. ADDITIONAL DATA

Certify By:

Jim Keesee Date: 4/1/14
USA Environmental, Inc SUXOS , Tel: (910) 728-7794

Verified By:

Kevin Lombardo Date: 4/1/14
CH2M Hill UXOQCS, Tel: 703-608-8247

USA Environmental, Inc., 720 Brooker Creek Boulevard, Suite 204, Oldsmar, Florida 34677, Telephone: 813.343.6336, Fax: 813.343.6377

PerFORM (DLA)

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

PREVIOUS EDITION MAY BE USED

DI CONTROL	RI FROM	M&S	UI	QUANTITY	SER	SUPPLEMENTARY ADDRESS	SIG	FUND	DISTRIBUTION	PROJECT	PRI	REQD	DDEL	DATE	ADV	RI	O/P	COND	MGT

Contract: N62470-02-D-1000 CTO: 069

1. TOTAL PRICE		2. SHIP FROM	3. SHIP TO
UNIT PRICE DOLLARS / CTS	DOLLARS / CTS	4. MARK FOR	

5. DOC DATE	6. NMFC	7. FRT RATE	8. TYPE CARGO	9. PS

10. QTY. REC'D	11.UP	12. UNIT WEIGHT	13. UNIT CUBE	14. UFC	15. SL

16. FREIGHT CLASSIFICATION NOMENCLATURE

17. ITEM NOMENCLATURE
Metal Scrap, (MDAS)

18. TY CONT	19. NO CONT	20. TOTAL WEIGHT	21. TOTAL CUBE
Drum, 55 Gal	1	360 lbs	

22. RECEIVED BY | 23. DATE RECEIVED

24. DOCUMENT NUMBER & SUFFIX (30-44)

Basic Material Content: Material Documented as Safe (MDAS)

Estimate Weight (lbs): 360 lbs

Container ID No.: 4 Seal ID No.: 436383

25. NATIONAL STOCK NO. & ADD (8-22)

Site address: USA Environmental, Inc.
Former Cat Island Bombing Target (BT-2)
MCALF Bogue, NC
Tel: (910) 728-7794

Ship To: Bonetti Explosives, Inc.
Attn: Matt Barnett
1618 Smith Rau Rd
Columbus, TX 78394
Tel: (979) 739-5597

26. RIC (4-6) UI (23-24) QTY (25-29) CON CODE (71) DIST (55-56) UP (74-80)

"The material listed on this form has been inspected or processed by DDESB-approved means, as required by DOD policy, and to the best of my knowledge and belief does not pose an explosive hazard"

27. ADDITIONAL DATA

Certify By:

Jim Keesee Date: 4/1/14
USA Environmental, Inc SUXOS , Tel: (910) 728-7794

Verified By:

Kevin Lombardo Date: 4/1/14
CH2M Hill UXOQCS, Tel: 703-608-8247

USA Environmental, Inc., 720 Brooker Creek Boulevard, Suite 204, Oldsmar, Florida 34677, Telephone: 813.343.6336, Fax: 813.343.6377

PerFORM (DLA)

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

1	2	3	4	5	6	7	23	24	25	26	27	28	29	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
DOC IDENT			RI FROM			M&S	UNIT	ISS	QUANTITY					SMR	SUPPLEMENTARY ADDRESS					SIG	FUND			DISTRIBUTION			PROJECT			PRI	REQD	DELTE			ADV	RI			O/P	CONDITION		MGT						

Contract: N62470-02-D-1000 CTO: 069

1. TOTAL PRICE		2. SHIP FROM	3. SHIP TO
UNIT PRICE DOLLARS	UNIT PRICE CTS	DOLLARS	CTS
		4. MARK FOR	13.

5. DOC DATE	6. NMFC	7. FRT RATE	8. TYPE CARGO	9. PS

10. QTY. REC'D	11.UP	12. UNIT WEIGHT	UNIT CUBE	14. UFC	15. SL

16. FREIGHT CLASSIFICATION NOMENCLATURE

17. ITEM NOMENCLATURE
Metal Scrap, (MDAS)

18. TY CONT	19. NO CONT	20. TOTAL WEIGHT	21. TOTAL CUBE
Drum, 55 Gal	1	280 lbs	

22. RECEIVED BY	23. DATE RECEIVED

24. DOCUMENT NUMBER & SUFFIX (30-44)

25. NATIONAL STOCK NO. & ADD (8-22)

26. RIC (4-6) UI (23-24) QTY (25-29) CON CODE (71) DIST (55-56) UP (74-80)

27. ADDITIONAL DATA

Basic Material Content: Material Documented as Safe (MDAS)

Estimate Weight (lbs): 280 lbs

Container ID No.: 5 Seal ID No.: 436388

Site address: USA Environmental, Inc.
Former Cat Island Bombing Target (BT-2)
MCALF Bogue, NC
Tel: (910) 728-7794

Ship To: Bonetti Explosives, Inc.
Attn: Matt Barnett
1618 Smith Rau Rd
Columbus, TX 78394
Tel: (979) 739-5597

"The material listed on this form has been inspected or processed by DDESB-approved means, as required by DOD policy, and to the best of my knowledge and belief does not pose an explosive hazard"

Certify By:

Jim Keesee Date: 4/2/14
USA Environmental, Inc SUXOS , Tel: (910) 728-7794

Verified By:

Kevin Lombardo Date: 4/2/14
CH2M Hill UXOQCS, Tel: 703-608-8247

USA Environmental, Inc., 720 Brooker Creek Boulevard, Suite 204, Oldsmar, Florida 34677, Telephone: 813.343.6336, Fax: 813.343.6377

PREVIOUS EDITION MAY BE USED

PerFORM (DLA)

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

1	2	3	4	5	6	7	23	24	25	26	27	28	29	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
DI OD CI NZ			RI FROM			M & S		UI NS IT		QUANTITY				SER	SUPPLE-MENTARY ADDRESS				SIG	FUND	DIS-TRI-BU-TION		PRO-JECT		PRI	REQD	DDEALTE		ADV	RI		O/P	COND	MGT														

Contract: N62470-02-D-1000 CTO: 069

1. TOTAL PRICE			2. SHIP FROM	3. SHIP TO
UNIT PRICE	DOLLARS	CTS		
DOLLARS	CTS		4. MARK FOR	
				13.

5. DOC DATE	6. NMFC	7. FRT RATE	8. TYPE CARGO	9. PS

10. QTY. REC'D	11.UP	12. UNIT WEIGHT	UNIT CUBE	14. UFC	15. SL

16. FREIGHT CLASSIFICATION NOMENCLATURE

17. ITEM NOMENCLATURE
Metal Scrap, (MDAS)

18. TY CONT	19. NO CONT	20. TOTAL WEIGHT	21. TOTAL CUBE
Drum, 55 Gal	1	684 lbs	

22. RECEIVED BY	23. DATE RECEIVED

24. DOCUMENT NUMBER & SUFFIX (30-44)

Basic Material Content: Material Documented as Safe (MDAS)

Estimate Weight (lbs): 684 lbs

Container ID No.: 6 Seal ID No.: 436387

25. NATIONAL STOCK NO. & ADD (8-22)

Site address: USA Environmental, Inc.
Former Cat Island Bombing Target
(BT-2) MCALF Bogue, NC
Tel: (910) 728-7794

Ship To: Bonetti Explosives, Inc.
Attn: Matt Barnett
1618 Smith Rau Rd
Columbus, TX 78394
Tel: (979) 739-5597

26. RIC (4-6) UI (23-24) QTY (25-29) CON CODE (71) DIST (55-56) UP (74-80)

"The material listed on this form has been inspected or processed by DDESB-approved means, as required by DOD policy, and to the best of my knowledge and belief does not pose an explosive hazard"

27. ADDITIONAL DATA

Certify By:

Jim Keesee Date: 4/2/14
USA Environmental, Inc SUXOS , Tel: (910) 728-7794

Verified By:

Kevin Lombardo Date: 4/2/14
CH2M Hill UXOQCS, Tel: 703-608-8247

USA Environmental, Inc., 720 Brooker Creek Boulevard, Suite 204, Oldsmar, Florida 34677, Telephone: 813.343.6336, Fax: 813.343.6377

PREVIOUS EDITION MAY BE USED

PerFORM (DLA)

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

24. DOCUMENT NUMBER & SUFFIX (30-44)

25. NATIONAL STOCK NO. & ADD (8-22)

26. RIC (4-6) UI (23-24) QTY (25-29) CON CODE (71) DIST (55-56) UP (74-80)

27. ADDITIONAL DATA

1	2	3	4	5	6	7	23	24	25	26	27	28	29	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
DOD CONTROL			RI FROM			M&S	UNIT	ISS	QUANTITY					SER	SUPPLEMENTARY ADDRESS					SIG	FUND			DISTRIBUTION			PROJECT			PRI	REQD	DDEATE			ADV	RI			O/P	COND	MGT							

Contract: N62470-02-D-1000 CTO: 069

1. TOTAL PRICE			2. SHIP FROM	3. SHIP TO
UNIT PRICE	DOLLARS	CTS	4. MARK FOR	
DOLLARS / CTS				

5. DOC DATE	6. NMFC	7. FRT RATE	8. TYPE CARGO	9. PS

10. QTY. REC'D	11.UP	12. UNIT WEIGHT	13. UNIT CUBE	14. UFC	15. SL

16. FREIGHT CLASSIFICATION NOMENCLATURE

17. ITEM NOMENCLATURE
Metal Scrap, (MDAS)

18. TY CONT	19. NO CONT	20. TOTAL WEIGHT	21. TOTAL CUBE
Drum, 55 Gal	1	643 lbs	

22. RECEIVED BY

23.

PREVIOUS EDITION MAY BE USED

DATE RECEIVED

Basic Material Content: Material Documented as Safe (MDAS)

Estimate Weight (lbs): 643 lbs

Container ID No.: 7 Seal ID No.: 436386

Site address: USA Environmental, Inc.
Former Cat Island Bombing Target (BT-2)
MCALF Bogue, NC
Tel: (910) 728-7794

Ship To: Bonetti Explosives, Inc.
Attn: Matt Barnett
1618 Smith Rau Rd
Columbus, TX 78394
Tel: (979) 739-5597

"The material listed on this form has been inspected or processed by DDESB-approved means, as required by DOD policy, and to the best of my knowledge and belief does not pose an explosive hazard"

Certify By:

Jim Keesee Date: 4/2/14
USA Environmental, Inc SUXOS , Tel: (910) 728-7794

Verified By:

Kevin Lombardo Date: 4/2/14
CH2M Hill UXOQCS, Tel: 703-608-8247

USA Environmental, Inc., 720 Brooker Creek Boulevard, Suite 204, Oldsmar, Florida 34677, Telephone: 813.343.6336, Fax: 813.343.6377

PerFORM (DLA)

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

PREVIOUS EDITION MAY BE USED

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DOCUMENT			RI FROM			M&S	UNIT	ISS	QUANTITY					SER	SUPPLEMENTARY ADDRESS					SIG	FUND		DISTRIBUTION			PROJECT			PRI	REQD	DELATE		ADV	RI		O/P	COND	MGT									

Contract: N62470-02-D-1000 CTO: 069

1. TOTAL PRICE			2. SHIP FROM	3. SHIP TO
UNIT PRICE	DOLLARS	CTS	4. MARK FOR	
DOLLARS	CTS			

5. DOC DATE	6. NMFC	7. FRT RATE	8. TYPE CARGO	9. PS

10. QTY. REC'D	11.UP	12. UNIT WEIGHT	13. UNIT CUBE	14. UFC	15. SL

16. FREIGHT CLASSIFICATION NOMENCLATURE

17. ITEM NOMENCLATURE
Metal Scrap, (MDAS)

18. TY CONT	19. NO CONT	20. TOTAL WEIGHT	21. TOTAL CUBE
Drum, 55 Gal	1	466 lbs	

22. RECEIVED BY	23. DATE RECEIVED

24. DOCUMENT NUMBER & SUFFIX (30-44)

25. NATIONAL STOCK NO. & ADD (8-22)

26. RIC (4-6) UI (23-24) QTY (25-29) CON CODE (71) DIST (55-56) UP (74-80)

27. ADDITIONAL DATA

Basic Material Content: Material Documented as Safe (MDAS)

Estimate Weight (lbs): 466 lbs

Container ID No.: 8 Seal ID No.: 436389

Site address: USA Environmental, Inc.
Former Cat Island Bombing Target (BT-2)
MCALF Bogue, NC
Tel: (910) 728-7794

Ship To: Bonetti Explosives, Inc.
Attn: Matt Barnett
1618 Smith Rau Rd
Columbus, TX 78394
Tel: (979) 739-5597

"The material listed on this form has been inspected or processed by DDESB-approved means, as required by DOD policy, and to the best of my knowledge and belief does not pose an explosive hazard"

Certify By:

Jim Keesee Date: 4/2/14
USA Environmental, Inc SUXOS , Tel: (910) 728-7794

Verified By:

Kevin Lombardo Date: 4/2/14
CH2M Hill UXOQCS, Tel: 703-608-8247

USA Environmental, Inc., 720 Brooker Creek Boulevard, Suite 204, Oldsmar, Florida 34677, Telephone: 813.343.6336, Fax: 813.343.6377

PerFORM (DLA)

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

PREVIOUS EDITION MAY BE USED

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DOD CONTROL			RI FROM			M&S	UNIT ISS			QUANTITY				SER	SUPPLEMENTARY ADDRESS				SIG	FUND	DISTRIBUTION			PROJECT		PRI	REQD	DATE	ADV	RI		O/P	COND	MGT													

Contract: N62470-02-D-1000 CTO: 069

1. TOTAL PRICE			2. SHIP FROM	3. SHIP TO
UNIT PRICE DOLLARS / CTS	DOLLARS	CTS	4. MARK FOR	

5. DOC DATE	6. NMFC	7. FRT RATE	8. TYPE CARGO	9. PS

10.			13. UNIT CUBE	14. UFC	15. SL

16. FREIGHT CLASSIFICATION NOMENCLATURE
QTY. REC'D 11.UP 12. UNIT WEIGHT

17. ITEM NOMENCLATURE
Metal Scrap, (MDAS)

18. TY CONT	19. NO CONT	20. TOTAL WEIGHT	21. TOTAL CUBE
Drum, 55 Gal	1	735 lbs	

22. RECEIVED BY	23. DATE RECEIVED

24. DOCUMENT NUMBER & SUFFIX (30-44)

Basic Material Content: Material Documented as Safe (MDAS)

Estimate Weight (lbs): 735 lbs

Container ID No.: 9 Seal ID No.: 467272

Site address: USA Environmental, Inc.
Former Cat Island Bombing Target (BT-2)
MCALF Bogue, NC
Tel: (910) 728-7794

25. NATIONAL STOCK NO. & ADD (8-22)

Ship To: Bonetti Explosives, Inc.
Attn: Matt Barnett
1618 Smith Rau Rd
Columbus, TX 78394
Tel: (979) 739-5597

26. RIC (4-6) UI (23-24) QTY (25-29) CON CODE (71) DIST (55-56) UP (74-80)

"The material listed on this form has been inspected or processed by DDESB-approved means, as required by DOD policy, and to the best of my knowledge and belief does not pose an explosive hazard"

27. ADDITIONAL DATA

Certify By:

Jim Keesee _____ Date: 4/3/14
USA Environmental, Inc SUXOS , Tel: (910) 728-7794

Verified By:

Kevin Lombardo _____ Date: 4/3/14
CH2M Hill UXOQCS, Tel: 703-608-8247

USA Environmental, Inc., 720 Brooker Creek Boulevard, Suite 204, Oldsmar, Florida 34677, Telephone: 813.343.6336, Fax: 813.343.6377

PerFORM (DLA)

Appendix B
NCDENR Temporary Emergency Permit

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Waste Management

Pat McCrory
Governor

Dexter R. Matthews
Director

John E. Skvarla, III
Secretary

January 27, 2014

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

G.W. Radford
Environmental Affairs Officer
Marine Corps Air Station Cherry Point
PSC Box 8003
Cherry Point, NC 28533-0003

Reference: Emergency Permit
Marine Corps Air Station Cherry Point and
Department of the Navy Naval Facilities Engineering Command
NC3 170 024 605 E1

Attn: Mr. Erik Delaney

Dear Mr. Radford:

Enclosed is the Emergency Permit issued to the Marine Corps Air Station Cherry Point and the Department of the Navy Naval Facilities Engineering Command to store and treat Material Potentially Presenting an Explosive Hazard (MPPEH) at the Marine Corps Auxiliary Landing Field Bogue (Bogue Field), Carteret County, North Carolina. MPPEH generated from range clearance activities on Wood Island in Bogue Sound will be transported to Bogue Field for temporary storage and demilitarization. Please note the specific conditions of the permit as they must be addressed. The public notice must be printed in the local newspaper within five (5) days of receipt of this written permit. Also, you must report the information specified in Condition eleven (11) of the permit within thirty (30) days after the termination of this permit.

If you have any questions, please contact Katherine O'Neal at (919) 707-8209 or at katherine.oneal@ncdenr.gov.

Sincerely,

Dexter Matthews, Director
Division of Waste Management

Enclosure

ec: Jon D. Johnston, US EPA, Region 4
Bobby Nelms
Bud McCarty
Bill Hunneke
Katherine O'Neal

1646 Mail Service Center, Raleigh, North Carolina 27699-1646
Phone\Fax: 919-707-8200 \ Internet: http//:portal.ncdenr.org/web/wm

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Permit No. NC3 170 024 605 E1
Date Issued: January 27, 2014

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
Division of Waste Management
1646 Mail Service Center
Raleigh, NC 27699-1646

EMERGENCY HAZARDOUS WASTE PERMIT

OPERATOR
Department of the Navy
Naval Facilities Engineering Command
Mid-Atlantic
6506 Hampton Blvd.
Building C
Norfolk, VA 23508-1278

AND

OWNER
Marine Corps Air Station Cherry Point
PCS Box 8003
Cherry Point, NC 28533-0003

are hereby issued a permit pursuant to 40 CFR 270.61 as adopted in 15A NCAC 13A .0113 to process Material Potentially Presenting an Explosive Hazard (MPPEH) at the Marine Corps Auxiliary Landing Field (MCALF) Bogue (Bogue Field), Carteret County, North Carolina. The MPPEH will be generated during range clearance activities on Wood Island, N.C., site of the Former Cat Island Bomb Target BT-2 associated with MCAS Cherry Point. Treatment activities are subject to the conditions set forth in this permit and in N. C. General Statutes 130A-294(c) and all applicable rules promulgated there under.

Dexter Matthews, Director
Division of Waste Management

1-28-14
Date

Conditions of Permit

The issuance of this permit will result in environmental benefits and the listed conditions are designed to protect public health and the environment. Issuance under 40 CFR 270.61 as adopted in 15A NCAC 13A .0113 is warranted because there is an imminent and substantial endangerment to human health and the environment.

1. Duration of Permit [40 CFR 270.61 as adopted in 15A NCAC 13A .0113]

   This permit is issued for a period of 90 days, February 1, 2014 through May 1, 2014. This permit may be terminated by the issuing authority at any time if he or she determines that the termination is appropriate and necessary to protect human health and the environment.

2. Duty to Comply [40 CFR 270.30(a) as adopted in 15A NCAC 13A .0113]

   The Permittee shall comply with all conditions of this permit. All words used in this permit shall have the meaning and definitions set forth in 40 CFR Parts 260.10 and 270.2 as adopted in 15A NCAC 13A .0102 and .0113. The filing of a request by the Permittee for a permit modification, revocation, and reissuance, or termination, or a notification of planned changes or anticipated non-compliance, does not stay any condition of this permit. Any permit non-compliance constitutes a violation of the Act and is ground for enforcement action including permit termination, revocation, and reissuance, or modification or for denial of a permit renewal application. In addition, a criminal or civil action may be brought in appropriate instances.

3. Duty to Mitigate [40 CFR 270.30(d) as adopted in 15A NCAC 13A .0113]

   The Permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from non-compliance with this permit.

4. Personnel Training [40 CFR 264.16 as adopted in 15A NCAC 13A .0109]

   Contact with wastes shall be limited to personnel adequately trained in handling of hazardous wastes. MCAS Cherry Point EOD and CH2M Hill personnel handling Material Potentially Presenting an Explosive Hazard (MPPEH) shall be qualified as described on page 5 of the Temporary Emergency RCRA Permit Application submitted December 2013.

5. Emergency Coordinator [40 CFR 264.55 as adopted in 15A NCAC 13A .0109]

   The Permittee will ensure that at all times there will be at least one employee on the premises with responsibility for coordinating all emergency response measures. The emergency coordinator must, in addition to carrying out the responsibilities specified in 40 CFR 264.56 as adopted in 15A NCAC 13A .0109, be thoroughly familiar with all aspects of the facility's contingency plan, all operations and activities at the facility, and

the location layout. This person must have the authority to commit the resources needed to carry out contingency action.

6. Operation and Maintenance [40 CFR 264.31 as adopted in 15A NCAC 13A .0109]

   The Permittee must maintain and operate the facility to minimize the possibility of unplanned fire, explosion, or sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment. There must be a clear zone for maximum protection from any potential shrapnel and hazardous waste releases.

7. Security [40 CFR 264.14 as adopted in 15A NCAC 13A .0109]

   The Permittee must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portions of the facility by providing a 24-hour surveillance system which continuously monitors and controls entry onto the active portion of the facility or the Permittee must have an artificial or natural barrier which completely surrounds the active portion of the facility and a means to control entry, at all times, through the gates or other entrances to the active portion of the facility.

8. Access to Communications or Alarm System [40 CFR 264.34 as adopted in 15A NCAC 13A .0109]

   Whenever hazardous waste is being poured, mixed, spread, or otherwise handled, the Permittee must ensure that all personnel involved in the operation will have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee.

9. **Waste management activities will consist of the following: Material Potentially Presenting an Explosive Hazard (MPPEH) determined Safe to Move will be transported from Wood Island in Bogue Sound to the Marine Corps Auxiliary Landing Field (MCALF) Bogue (Bogue Field) in Carteret County, North Carolina. Storage containers marked "MPPEH" will be used to store MPPEH at Bogue Field prior to demilitarization and inspection. If all surfaces of an item cannot be inspected, the item will undergo demilitarization using a shredding machine which will shred the item so all surfaces are visible for inspection. Following demilitarization, the material will be inspected by a UXO Technician III and a UXO Quality Control Specialist to document that the MPPEH is free of explosive hazards. Following documentation of these two visual inspections, the MPPEH becomes Material Documented as Safe (MDAS). The MDAS will be placed into a storage box for offsite disposal. Treatment will be performed by qualified MCAS Cherry Point EOD or CH2M Hill personnel. Treatment activities shall be as described on pages 3 and 4 of the Temporary Emergency RCRA Permit Application submitted December 2013. Personnel handling MPPEH shall be qualified as described on page 5 of the Temporary Emergency RCRA Permit Application submitted December 2013.**

10. Arrangements with Local Authorities [40 CFR 264.37 as adopted in 15A NCAC 13A .0109]

    The Permittee shall notify local police and fire departments of details of the treatment activity for treatment activities taking place off base.

11. Reporting

    The Permittee shall submit to the North Carolina Department of Environment and Natural Resources, Hazardous Waste Section within 30 days after the termination of this permit, the following information in writing:

    (a) Emergency Permit number
    (b) Actual dates of treatment
    (c) Description and quantity of waste
    (d) Name of emergency coordinator
    (e) A certification that the public notice condition (item 14) was complied with
    (f) A certification that the emergency has been alleviated and no residue remains at the treatment facility
    (g) A copy of the manifest for wastes disposed of or treated off-site
    (h) Soil analysis before and after treatment (dependent on type of waste treated)

12. Property Rights [40 CFR 270.30(g) as adopted in 15A NCAC 13A .0113]

    The issuance of this permit does not convey any property rights of any sort or any exclusive privilege.

13. Duty to Reapply [40 CFR 270.30(b) as adopted in 15A NCAC 13A .0113]

    This Permittee shall apply for a new permit if the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit.

14. Public Notice [40 CFR 270.61 and 124.10 as adopted in 15A NCAC 13A .0113 and .0105]

    The enclosed public notice shall be run within five (5) days of the receipt of this written permit in a major local newspaper of general circulation.

PUBLIC NOTICE
STATE OF NORTH CAROLINA
HAZARDOUS WASTE SECTION
DIVISION OF WASTE MANAGEMENT
1646 Mail Service Center
RALEIGH, N.C. 27699-1646
TELEPHONE: (919) 707-8200

NOTICE OF ISSUANCE OF EMERGENCY PERMIT UNDER THE NORTH CAROLINA HAZARDOUS WASTE MANAGEMENT RULES.

The NC Department of Environment and Natural Resources has issued a temporary emergency permit under 40 CFR 270.61 as adopted in 15A NCAC 13A .0113 to MCAS Cherry Point and the Department of the Navy Naval Facilities Engineering Command to treat Material Potentially Presenting an Explosive Hazard (MPPEH) at Bogue Airfield, Carteret County, North Carolina. The MPPEH will be generated during range clearance activities on Wood Island, N.C., site of the Former Cat Island Bomb Target BT-2 associated with MCAS Cherry Point. Treatment of MPPEH at Bogue Airfield will consist of demilitarization by shredding. The permit was drafted in accordance with the North Carolina Hazardous Waste Management Rules. The permit is effective for a period of 90 days, February 1, 2014 through May 1, 2014.

Comments concerning the permit issuance or the permit conditions may be submitted to the Hazardous Waste Section, ATTENTION: Ms. Julie Woosley. All comments will be considered in the formulation of future emergency permits.

Appendix C
Vibration Monitoring Data

Instantel

Event Report

VMP-1 (Wood Island) Histogram

Histogram Start Time	11:14:06 March 21, 2014
Histogram Finish Time	13:01:21 March 21, 2014
Number of Intervals	107.00 at 1 minute
Range	Geo:254.0 mm/s
Sample Rate	1024sps

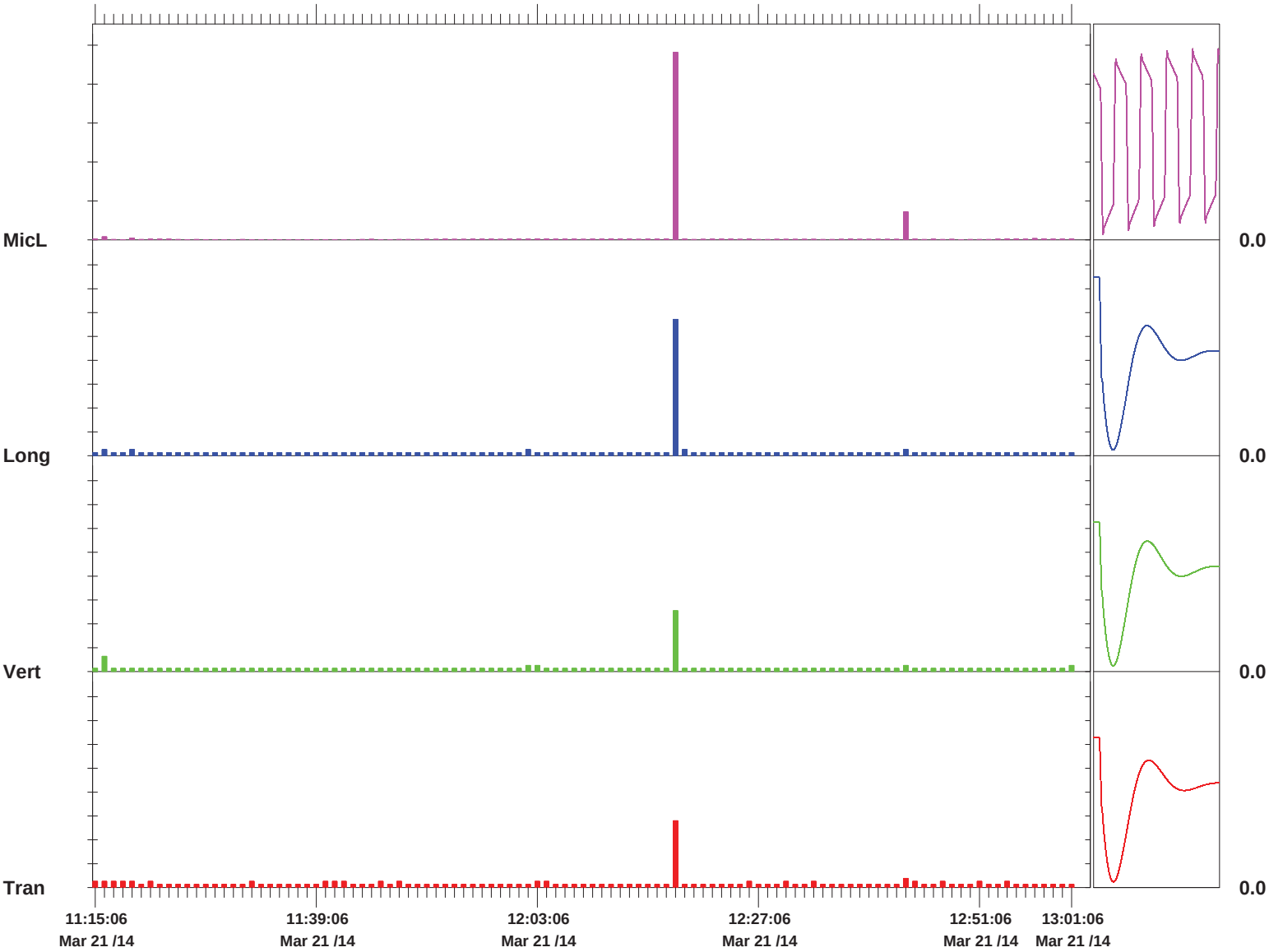
Serial Number	BE20125 V 10.60-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	August 9, 2013 by Instantel
File Name	V125F8XZ.7I0

Notes

Microphone	Linear Weighting
PSPL	481.0 pa.(L) on March 21, 2014 at 12:18:06
ZC Freq	37 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 577 mv)

	Tran	Vert	Long	
PPV	2.794	2.540	5.715	mm/s
ZC Freq	64	51	6.2	Hz
Date	Mar 21 /14	Mar 21 /14	Mar 21 /14	
Time	12:18:06	12:18:06	12:18:06	
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.6	7.6	Hz
Overswing Ratio	4.0	3.5	3.6	

Peak Vector Sum 6.051 mm/s on March 21, 2014 at 12:18:06



Time Scale: 1 minute /div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 100.00 pa.(L)/div Sensor Check

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Instantel

Event Report VMP-1 (Wood Island) Waveform 1

Date/Time	Vert at 12:17:12 March 21, 2014
Trigger Source	Geo: 1.270 mm/s
Range	Geo: 254.0 mm/s
Record Time	3.0 sec at 1024 sps

Serial Number	BE20125 V 10.60-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	August 9, 2013 by Instantel
File Name	V125F8Y2.4O0

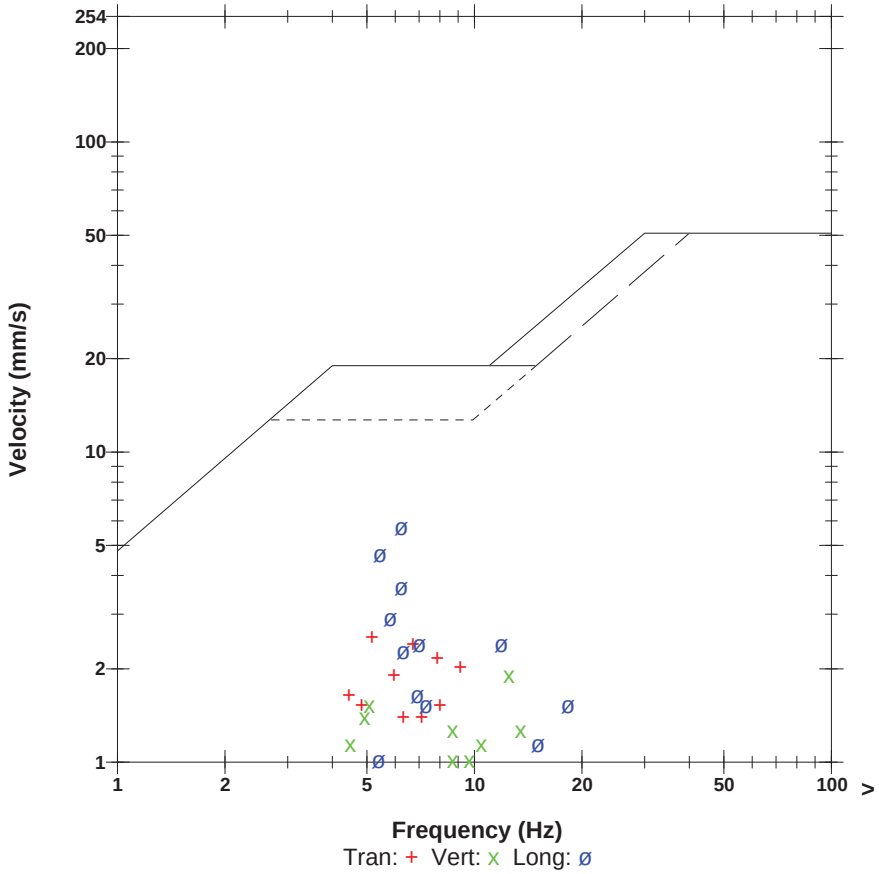
Notes

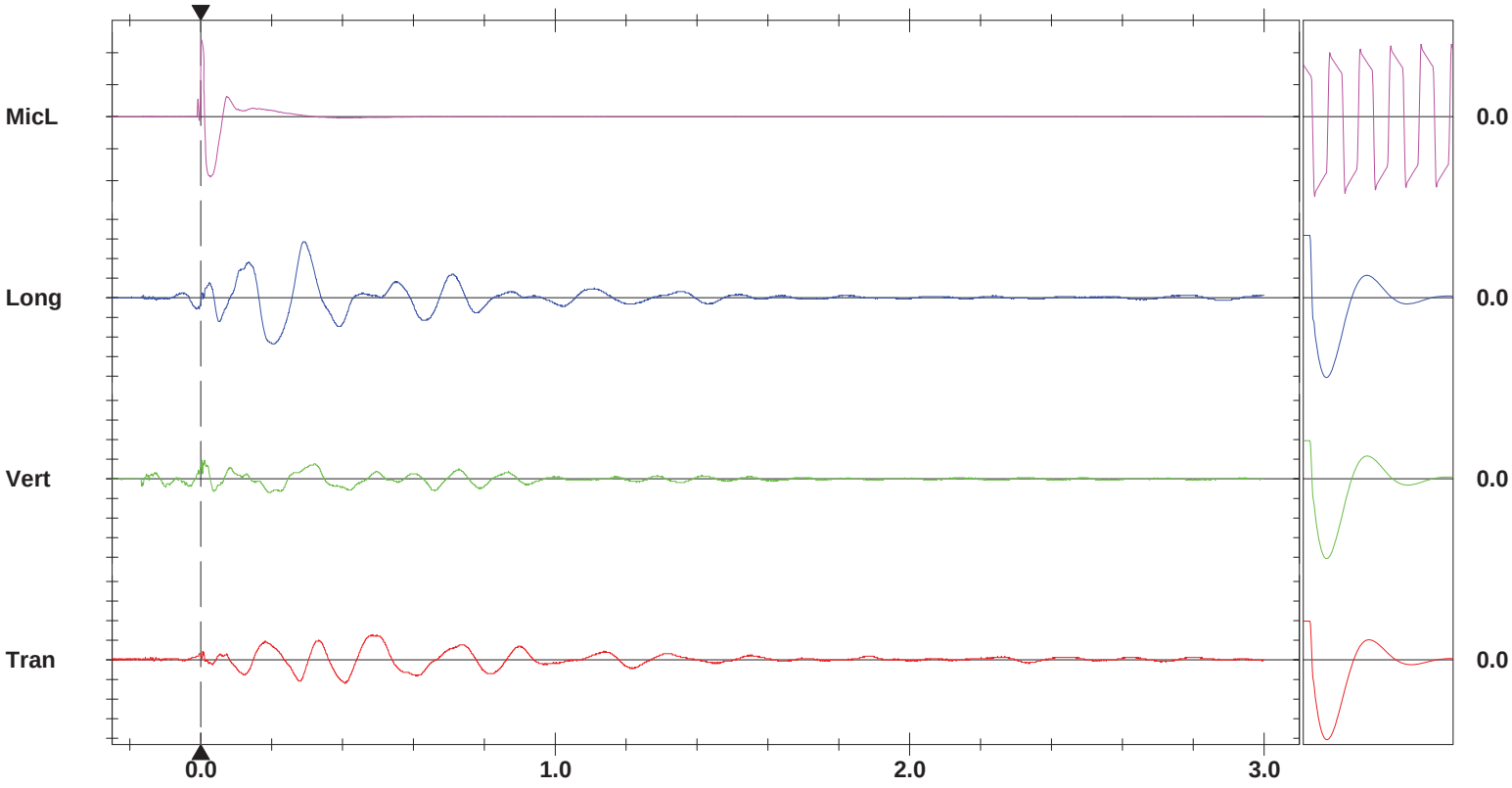
Microphone	Linear Weighting
PSPL	481.0 pa.(L) at 0.002 sec
ZC Freq	37 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 577 mv)

	Tran	Vert	Long	
PPV	2.540	1.905	5.715	mm/s
ZC Freq	5.2	12	6.2	Hz
Time (Rel. to Trig)	0.479	0.003	0.288	sec
Peak Acceleration	0.053	0.106	0.066	g
Peak Displacement	0.086	0.045	0.151	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.6	7.6	Hz
Overswing Ratio	4.0	3.5	3.6	

Peak Vector Sum 6.051 mm/s at 0.288 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 200.0 pa.(L)/div Sensor Check

Trigger = ▶—— ——◀

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Instantel

Event Report

VMP-1 (Wood Island) Waveform 2

Date/Time	Vert at 12:17:17 March 21, 2014
Trigger Source	Geo: 1.270 mm/s
Range	Geo: 254.0 mm/s
Record Time	3.0 sec at 1024 sps

Serial Number	BE20125 V 10.60-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	August 9, 2013 by Instantel
File Name	V125F8Y2.4T0

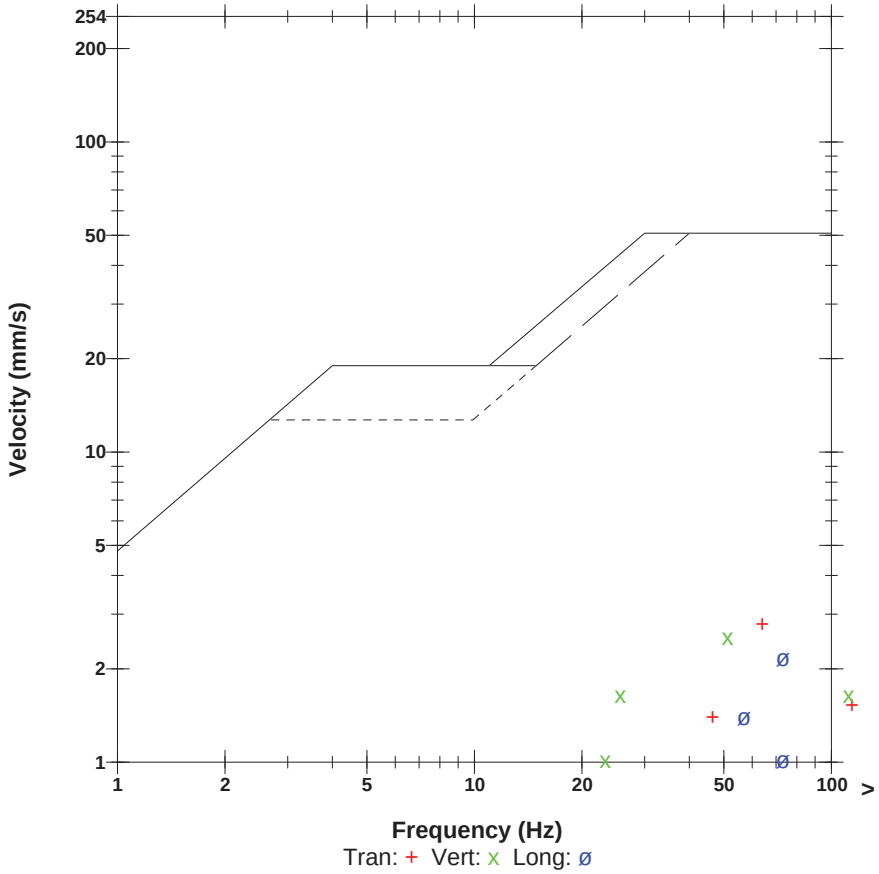
Notes

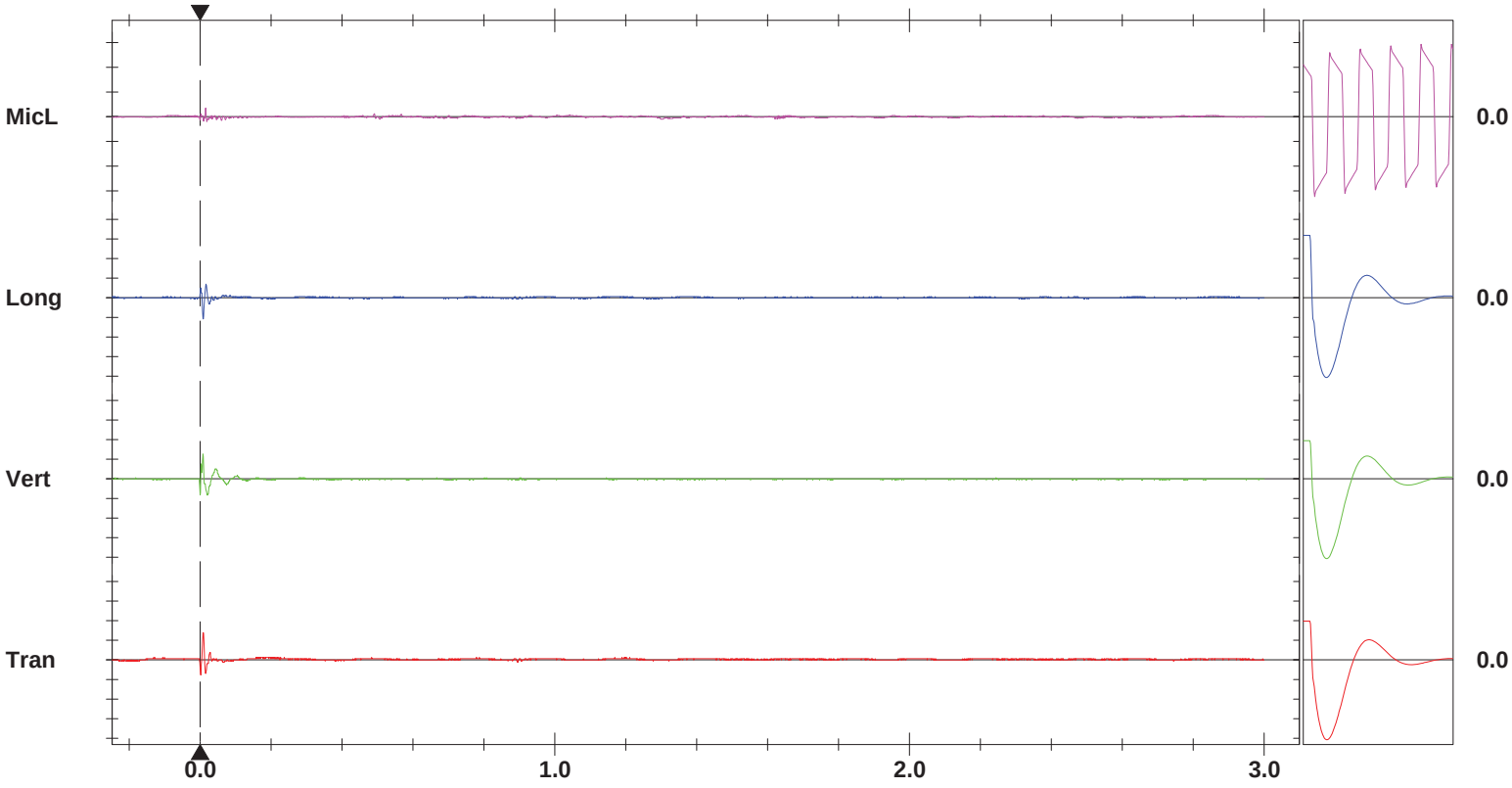
Microphone	Linear Weighting
PSPL	3.500 pa.(L) at 0.016 sec
ZC Freq	>100 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 577 mv)

	Tran	Vert	Long	
PPV	2.794	2.540	2.159	mm/s
ZC Freq	64	51	73	Hz
Time (Rel. to Trig)	0.009	0.008	0.009	sec
Peak Acceleration	0.119	0.172	0.093	g
Peak Displacement	0.007	0.009	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.6	7.6	Hz
Overswing Ratio	4.0	3.5	3.6	

Peak Vector Sum 4.206 mm/s at 0.008 sec

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check

Trigger =

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Instantel

Event Report

VMP-2 (Burlington St.) Histogram

Histogram Start Time	11:44:29 March 21, 2014
Histogram Finish Time	12:29:16 March 21, 2014
Number of Intervals	44.00 at 1 minute
Range	Geo:254.0 mm/s
Sample Rate	1024sps

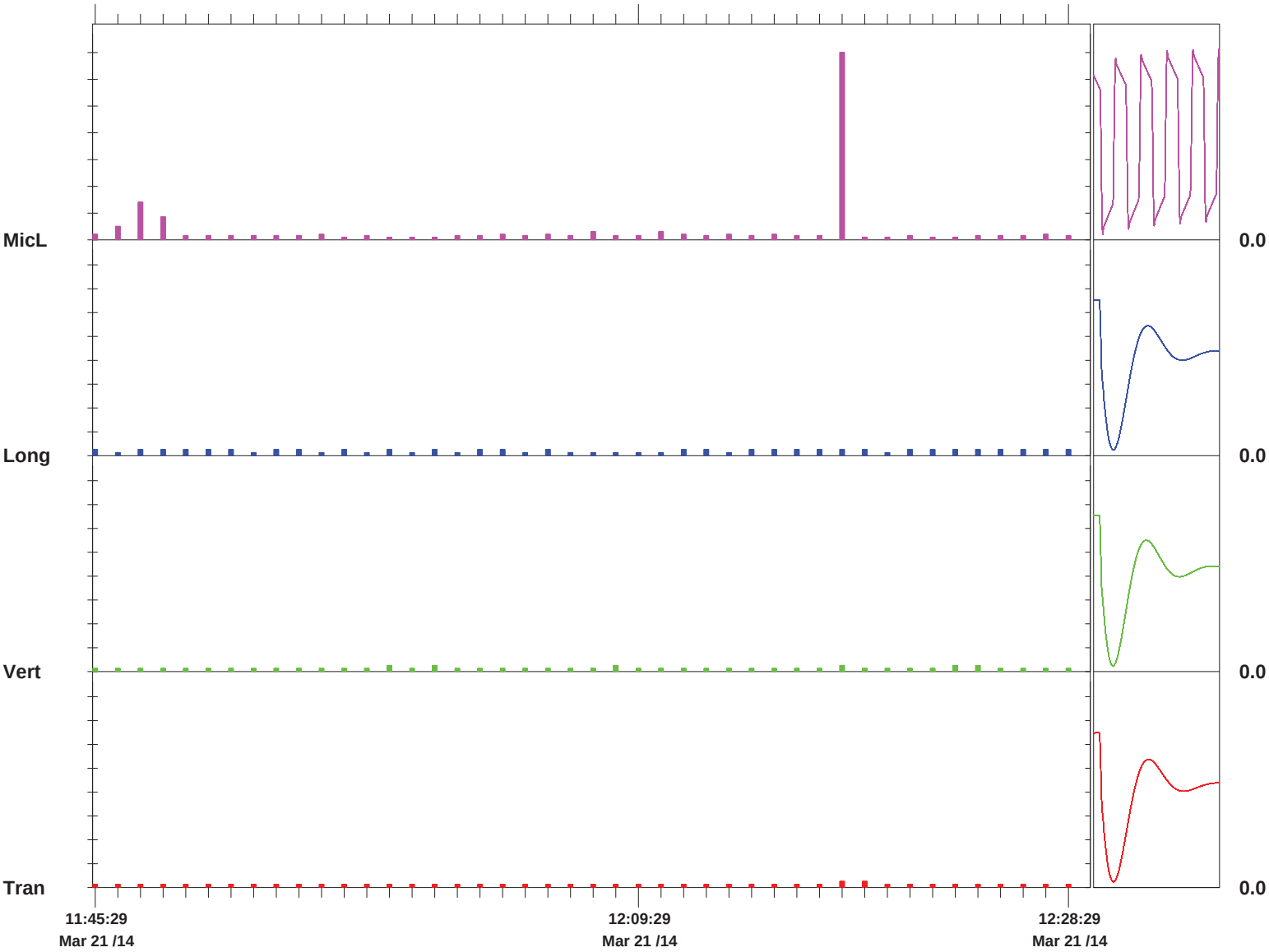
Serial Number	BE20126 V 10.60-8.17 MiniMate Plus
Battery Level	6.4 Volts
Unit Calibration	August 9, 2013 by Instantel
File Name	V126F8Y0.M50

Notes

Microphone	Linear Weighting
PSPL	35.00 pa.(L) on March 21, 2014 at 12:18:29
ZC Freq	20 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 579 mv)

	Tran	Vert	Long	
PPV	0.254	0.254	0.254	mm/s
ZC Freq	>100	>100	>100	Hz
Date	Mar 21 /14	Mar 21 /14	Mar 21 /14	
Time	12:18:29	11:58:29	11:45:29	
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.8	7.5	Hz
Overswing Ratio	3.9	3.4	3.6	

Peak Vector Sum 0.381 mm/s on March 21, 2014 at 12:18:29



Time Scale: 1 minute /div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check

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Instantel

Event Report

VMP-3 (Park Dr.) Histogram

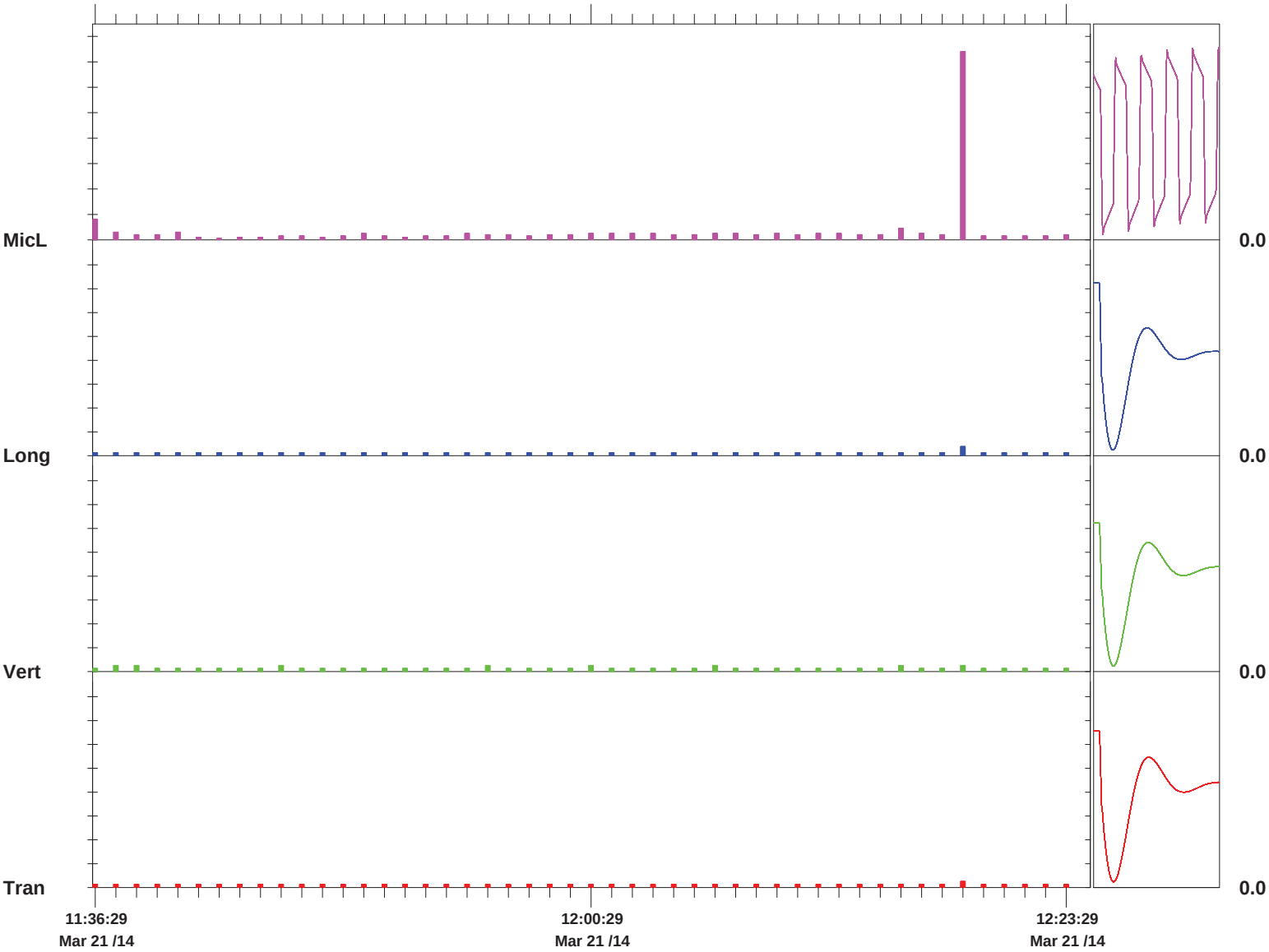
Histogram Start Time	11:35:29 March 21, 2014	**Serial Number**	BE20300 V 10.60-8.17 MiniMate Plus
Histogram Finish Time	12:24:00 March 21, 2014	**Battery Level**	6.3 Volts
Number of Intervals	48.00 at 1 minute	**Unit Calibration**	September 20, 2013 by Instantel
Range	Geo:254.0 mm/s	**File Name**	V300F8Y0.750
Sample Rate	1024sps		

Notes

Microphone	Linear Weighting
PSPL	37.00 pa.(L) on March 21, 2014 at 12:18:29
ZC Freq	22 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 544 mv)

	Tran	Vert	Long	
PPV	0.254	0.254	0.381	mm/s
ZC Freq	>100	>100	37	Hz
Date	Mar 21 /14	Mar 21 /14	Mar 21 /14	
Time	12:18:29	11:37:29	12:18:29	
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.4	7.6	Hz
Overswing Ratio	3.6	3.7	3.9	

Peak Vector Sum 0.421 mm/s on March 21, 2014 at 12:18:29



Time Scale: 1 minute /div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check

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Event Report VMP-3 (Park Dr.) Background Check

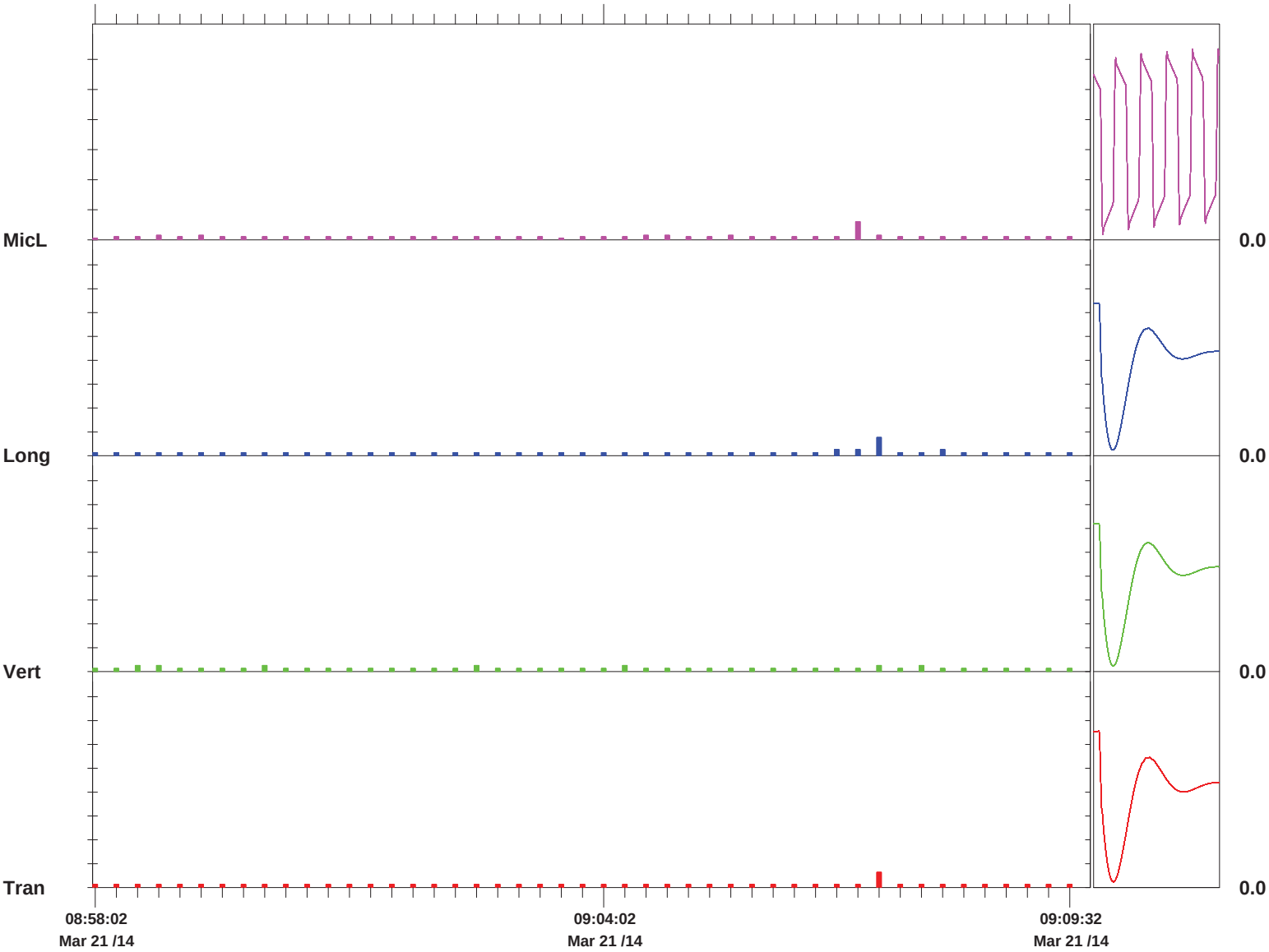
Histogram Start Time	08:57:47 March 21, 2014
Histogram Finish Time	09:09:34 March 21, 2014
Number of Intervals	47.00 at 15 seconds
Range	Geo:254.0 mm/s
Sample Rate	1024sps
Notes	

Serial Number	BE20300 V 10.60-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	September 20, 2013 by Instantel
File Name	V300F8XS.WB0
Scaled Distance	1281.6 (609.6 m, 0.2 kg)
Post Event Notes	
VMP - 3 Background vibrations/noise check	

Microphone	Linear Weighting
PSPL	3.000 pa.(L) on March 21, 2014 at 09:07:02
ZC Freq	2.0 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 620 mv)

	Tran	Vert	Long	
PPV	0.635	0.254	0.762	mm/s
ZC Freq	>100	>100	>100	Hz
Date	Mar 21 /14	Mar 21 /14	Mar 21 /14	
Time	09:07:17	08:58:32	09:07:17	
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.5	7.5	Hz
Overswing Ratio	3.6	3.8	4.0	

Peak Vector Sum 0.907 mm/s on March 21, 2014 at 09:07:17



Time Scale: 15 seconds /div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check

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Appendix D
IDW Results and Disposal Manifest

BT-2 CAT ISLAND
IDW ANALYTICAL RESULTS
April 2014

Sample ID	BT2-IDW-0403014
Sample Date	4/3/14
Chemical Name	
Explosives (MG/KG)	
1,3,5-Trinitrobenzene	0.2 NU
1,3-Dinitrobenzene	0.2 U
2,4,6-Trinitrotoluene	0.2 U
2,4-Dinitrotoluene	0.2 U
2,6-Dinitrotoluene	0.2 U
2-Amino-4,6-dinitrotoluene	0.2 U
2-Nitrotoluene	0.2 U
3-Nitrotoluene	0.2 U
4-Amino-2,6-dinitrotoluene	0.2 U
4-Nitrotoluene	0.2 U
HMX	0.2 U
Nitrobenzene	0.2 U
Nitroglycerin	0.5 U
PETN	0.5 U
RDX	0.2 U
Tetryl	0.2 XU
TCLP Metals (MG/L)	
Arsenic	0.06 U
Barium	0.0531 J
Cadmium	0.0137 J
Chromium	0.04 U
Lead	3.4
Mercury	0.0016 U
Selenium	0.05 U
Silver	0.02 U

Notes:
J - Analyte present. Value may or may not be accurate or precise
MG/KG - Milligrams per kilogram
MG/L - Milligrams per liter
N - The matrix spike/matrix spike duplicate accuracy and/or precision are outside criteria
U - The material was analyzed for, but not detected
X - The parameter shows a potential positive bias on a reported concentration due to an initial calibration verification (ICV) or continuing calibration verification (CCV) exceeding the upper control limit on the high side.

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number NC1170027267	2. Page 1 of 1	3. Emergency Response Phone 800-255-3924-MIS0007951	4. Waste Tracking Number

GENERATOR

5. Generator's Name and Mailing Address
MCAS Cherry Point
Env. Affairs Dept. PCS Box 8006
Cherry Point, NC 28533 USA
Generator's Phone: 252-466-5376

Generator's Site Address (if different than mailing address)
Bogue Bldg 8102
Cape Carteret, NC

6. Transporter 1 Company Name: A&D Environmental Services, Inc.
U.S. EPA ID Number: NCD986232221

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
EQ Florida, Inc.
2002 North Orient Road
Tampa, FL 33619
Facility's Phone: 813-319-3418
U.S. EPA ID Number: FLD981392494

9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1. Non-Hazardous, Non-Regulated Material (IDW-Soil)	1	DM	680	P	None
2.					
3.					
4.					

13. Special Handling Instructions and Additional Information
1) Appl#: E141840EQFL 1 x 55gal. (CTO69-BT2-S01)
A&D Job No: 71889 P.O. No: 22800 March 2014 Cat Island Target surface sweep IDW

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: John S. Myers for MCAS Cherry Point
Signature: John S. Myers
Month Day Year: May 28 2014

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Tony Jeffries
Signature: Tony Jeffries
Month Day Year: 6 3 14
Transporter 2 Printed/Typed Name
Signature
Month Day Year

DESIGNATED FACILITY

17. Discrepancy
17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
17b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:
17c. Signature of Alternate Facility (or Generator)
Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a
Printed/Typed Name
Signature
Month Day Year