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FINAL AFTER ACTION REPORT FOR THE EXECUTION OF A SELECTED RESPONSE FOR
DISCARDED MILITARY MUNITIONS AT BUILDING 365 MUNITIONS RESPONSE AREA NAS
CECIL FIELD FL
5/30/2013
CH2MHILL

Final

After Action Report

Execution of a Selected Response for
Discarded Military Munitions
Building 365 Munitions Response Area

Former Naval Air Station Cecil Field
Jacksonville, Florida

Contract No. N62470-08-D-1006
Task Order No. JM07

Prepared for



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Acronyms and Abbreviations

AGVIQ-CH2M HILL	AGVIQ-CH2M HILL Constructors, Inc. Joint Venture III
bgs	below ground surface
BRAC	Base Realignment and Closure
BRAC PMO SE	Base Realignment and Closure, Program Management Office Southeast
CH2M HILL	CH2M HILL Constructors, Inc.
CQCR	Contractor Quality Control Report
DMM	Discarded Military Munitions
DFOW	Definable Features of Work
DGPS	Differential Global Positioning System
ECA	equipment check area
EPA	U.S. Environmental Protection Agency
ESP	Explosives Site Plan
ESS	Explosives Safety Submission
EZ	Exclusion Zone
HE	high explosive
ICA	instrument certification area
JAA	Jacksonville Aviation Authority
lbs	pounds
MDAS	Material Documented as Safe
MEC	Munitions and Explosives of Concern
mm	millimeter
MPPEH	Material Potentially Presenting an Explosive Hazard
MR	Munitions Response
MRA	Munitions Response Area
NAS	Naval Air Station
NAVFAC SE	U.S. Naval Facilities Engineering Command Southeast
NAVSEA	Naval Sea Systems Command
NOSSA	Naval Ordnance Safety and Security Activity
NOSSAINST	Naval Ordnance Safety and Security Activity Instruction
PLS	Professional Land Surveyor
QA	Quality Assurance
QC	Quality Control
RTK	Real-Time Kinematic
UXO	Unexploded Ordnance
UXOQCS	UXO Quality Control Specialist

1.0 Brief Description of MRA

The subject of the "Selected Response" for discarded military munitions (DMM) is the Building 365 Munitions Response Area (MRA) located at the former Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. The munitions response (MR) action was implemented by CH2M HILL Constructors, Inc. (CH2M HILL) and AGVIQ-CH2M HILL Constructors, Inc. Joint Venture III (AGVIQ-CH2M HILL) for U.S. Naval Facilities Engineering Command Southeast (NAVFAC SE)/Base Realignment and Closure (BRAC), Program Management Office Southeast (BRAC PMO SE) under Remedial Action Contracts No. N62467-01-D-0331, Contract Task Order No. 0029 and No. N62470-08-D-1006, Task Order No. JM07.

The Building 365 MRA encompasses approximately 28.34 acres and is composed of the Phase I (approximate 20-acre), Phase II (approximate 2-acre), and Phase III (approximately 6-acre) work areas.

The scope of the MR at the Building 365 MRA was to perform a Time Critical Removal Action under the Comprehensive Environmental Response, Compensation and Liability Act to remove munitions and explosives of concern (MEC) from 0 to 1 foot below ground surface (bgs). The "Selected Response" was to be performed until no MEC was recovered within one row of periphery grids surrounding the MRA.

Future use of the property is industrial. The property has already been transferred from Navy control to the Jacksonville Aviation Authority (JAA).

2.0 Request to Cancel EZs

Request Naval Ordnance Safety and Security Activity (NOSSA) cancel all Explosive Safety Quantity-Distance arcs which were approved for use with the Building 365 MRA.

3.0 Summary of MEC and/or MPPEH Found

Seven hundred sixty-three (763) MEC and/or material potentially presenting an explosive hazard (MPPEH) items were recovered during the MR action. Figure 6-3 shows the locations of recovered MEC/MPPEH items.

Phase I of the MR action was completed December 2004 to March 2005. Following is a summary of the items recovered during Phase I:

- (699) MEC/MPPEH
 - (203) each Cartridge, 20 millimeter (mm), HEI, M56

- (427) each Cartridge, Impulse MK2, MK14 MOD 0, MK19, MK124
- (21) each Cartridge, Signal, MK4 MOD 0, CXU-3A/B
- (2) each Bomb, Practice M23, MK76/BDU 35
- (46) each Small Arms Blanks
- 292.75 pounds (lbs) of Material Documented as Safe (MDAS)
- 2,606 lbs of cultural debris

Phase II of the MR action was completed May to June 2006. Following is a summary of the items recovered during Phase II:

- (19) MEC/MPPEH
 - (3) each Projectile, 20mm, HEI, M56
 - (14) each Cartridge, Impulse MK1 MOD 3, MK2, MK19
 - (2) each Cartridge, Signal, MK4 MOD 0
- 12 lbs of MDAS
- 157 lbs of cultural debris

Phase III of the MR action was completed July 2010 to April 2012. Following is a summary of the items recovered during Phase III:

- (45) MEC/MPPEH
 - (1) each Cartridge, 20mm, HEI, M56
 - (3) each Cartridge, 20mm, TP, MK11
 - (4) each Cartridge, 20mm, TP-T, M221
 - (1) each Projectile, 20mm, TP-T, M221
 - (5) each Case, 20mm, with Primer
 - (24) each Cartridge, Impulse MK2, MK8, CCU 41/B, CCU 44/B, CCU 45/B
 - (3) each Cartridge, Signal, MK4 MOD 0
 - (4) each Small Arms Blanks
- 31 lbs of MDAS
- 1,221 lbs of cultural debris

MEC/MPPEH items were disposed by open detonation on March 2, 2005 (Phase I), March 10, 2005 (Phase I), March 17, 2005 (Phase I), June 28, 2006 (Phase II), July 28, 2010 (Phase III), and April 11, 2012 (Phase III). Open detonation events were completed in accordance with the project Work Plans and Explosives Safety Submissions (ESSs)/Explosive Site Plans (ESPs) at the sited demolition locations within either the Building 365 MRA or Hangar 860 MRA, except the March 10, 2005 event which was completed by the Naval Station Mayport Explosive Ordnance Disposal Unit as a blow in place. The blow in place was completed within Grid D4 at the location of the Cartridge, Signal CXU-3A/B (see Figure 6-3).

Soil samples were collected from representative locations where significant quantities of MEC were recovered to determine if MEC had caused an adverse impact to the surrounding soil, and from the detonation sites to ensure soil impacted by MEC detonations had been sufficiently removed. Samples were laboratory analyzed for the 8 Resource Conservation and Recovery Act metals by U.S. Environmental Protection Agency (EPA) Method 6010B or 6010C, and 7471A and nitroaromatic explosives by EPA Method 8330. Based on the analytical results, MEC discovered in soil and MEC detonations have not caused an adverse environmental impact.

All MPPEH were 100% visually inspected on site by a qualified Unexploded Ordnance (UXO) Technician III. If the UXO Technician III certified MPPEH to be clear of any explosive hazard, the item was passed to a CH2M HILL UXO Technician III for a second independent 100% visual re-inspection. The DD Form 1348-1A was used to document the certification and verification of MDAS (per Naval Sea Systems Command [NAVSEA] Ordnance Publication 5, Volume 1, Section 13-15.7.1).

Final processing of the MDAS removed during Phases I and II was performed from January 24 to 25, 2011, at the Chesapeake Metals, Inc. facility and the Smith Iron facility located in Richmond, Virginia. Destruct was performed using heat treatment, oxygen/propane torches, heating/cutting/ melting, and shredding of the metal with sufficient heat to burn or destroy any residual explosive material and render the material as unrecognizable as ordnance items. Final disposition/ destruct for the MDAS removed during Phase III is pending disposition of MDAS removed from the Hangar 860 MRA to be completed under separate contract (scheduled for completion calendar year 2013).

All cultural debris was transferred to and recycled at local scrap yards located in Jacksonville, Florida.

4.0 Removal Action Methods and Technology

4.1 Detection Equipment, Method, and Standards

Hand held analog geophysical metal detectors were used at the site. Cartridge actuated devices found at the site were historically constructed of both ferrous and non-ferrous metals; therefore, White's hand held all-metals detectors (Spectrum, DFX-300, or equivalent) were used to complete MEC avoidance and MEC intrusive investigation.

The White's all-metals detector is a hand held analog magnetometer that detects both ferrous and non-ferrous metals. The instrument provides an audible signal representing the magnitude and direction of the local magnetic field. In application, the operator sweeps the instrument back and forth in the area of interest and monitors the change in pitch of the sound emanating from the instrument. The change in pitch is the response to a secondary magnetic field produced by a metallic item in the area of interest.

4.1.1 Navigational Equipment

MRA boundary, operational grid systems, and MEC/MPPEH locations were surveyed using Real Time Kinematic (RTK) Differential Global Positioning System (DGPS) survey equipment. Accuracies of all navigational equipment are sub-foot.

4.1.2 Equipment Check-Out and Calibration

Equipment checks were performed over static items in an equipment check area (ECA) or Instrument Certification Area (ICA) on the White's all-metals detectors to ensure the equipment was operating appropriately. Any equipment not passing system checks were fixed or removed from site. The ECA was used daily by each operator. Each operator was tested through the ICA (with no failure) when the operator was new to the site, obtained a new hand held all-metals detector, or adjusted the settings on the current hand held all-metals detector.

4.2 Data Management, Collection and Storage

CH2M HILL strictly controls the entire MR project process, documentation, and quality control (QC) in accordance with the Project QC Plan included in the Project Work Plans. Daily production and quality findings were recorded onto Contractor Production Reports, Contactor Quality Control Reports (CQCRs), and into Anomaly Investigation Dig Sheets. Listed below is the information required daily:

- Project Information (e.g., personnel, teams, instrument serial numbers, grid IDs, and locations)
- Field Team Leader Notes (e.g., safety meetings, logbooks, field requests to management)
- UXO Team notes (e.g., grids, files, personnel, methods, instruments, GPS coordinates and descriptions of items found)
- Grid Statuses (e.g., activities performed by grid and by area, percentages and quantities complete or remaining)
- Demolition Tracking
- Quality Control (e.g., QC on notes and field activities)

Field operations data were captured using GPS-enabled handheld devices running mobile Geographical Information System. The data were transferred to a centralized relational database, where they were then validated (QC checks).

4.3 Response Technique

The MR action was completed in three phases. Phase I was completed on approximately 20 acres from December 6, 2004 to March 19, 2005, Phase II was completed on approximately 2 acres from May 15, 2006 to June 28, 2006, and Phase III was completed on approximately 6 acres from July 9, 2010 to April 11, 2012.

4.3.1 MEC Avoidance

MEC avoidance was utilized for site preparation activities, including surveying and vegetation removal. MEC avoidance included the visual observation of the ground surface by UXO Technicians augmented with the addition of White's hand held all-metals detectors. The instrument was used to check inside heavy vegetation (e.g., a thick bush) where it was not possible for the UXO Technician to visually check the area. Also prior to the beginning of vegetation removal operations, UXO Technicians conducted a search of the cutting area to ensure that the area was free of any surface MEC/MPPEH items and metal debris.

4.3.1.1 Site Survey

The initial 5-acre site boundary and operational grid system, and subsequent expansion site boundaries and operational grid systems were emplaced using RTK DGPS. Horizontal controls for graphic and non-graphic information were Mercator Projection, GRS 80, State Plane Coordinate System, North American Datum 1983, Lambert Zones 1 through 6. Vertical controls were mean sea level, North American Vertical Datum, 1988. Boundary surveys were performed first for each work phase, and included placement of colored flagging on stakes along the perimeter to establish work area limits. A system of 100-foot by 100-foot grids coinciding with the Florida State Plane Coordinate system was then established across the site using labeled stakes. The grids were identified in an alphanumeric succession and sequence (see Figure 6-3). Following grid placement for each work phase, the extents of the exclusion zones (EZs) were surveyed to include the placement of stakes with colored flagging along the perimeter of each EZ. The initial 5-acre site boundary and operational grid system were emplaced by a local Professional Land Surveyor (PLS). Subsequent expansion boundaries and operational grid systems were emplaced by the UXO subcontractor survey team. The final MRA site boundary is shown on Figure 6-3.

4.3.1.2 Vegetation Removal

Vegetation removal over select areas of the MRA was necessary to complete the mag&dig MEC intrusive investigation. A local subcontractor performed the vegetation removal by cutting the brush to a height of approximately 6 inches above ground surface using heavy vegetation removal machinery. This allowed the UXO Technicians to visually observe the ground surface during the mag&dig operations.

4.3.2 MEC Intrusive Investigation

4.3.2.1 Mag&Dig

Following vegetation removal, the grids were divided into lanes approximately 5 feet wide marked by string. A UXO Technician used the White's hand held all-metals detector for searching within the survey lane. When a surface or subsurface anomaly was detected, a UXO Technician marked and excavated the anomaly to determine if it presented a MEC/MPPEH hazard. Once the anomaly was manually investigated and a metallic item removed, the anomaly location was surveyed again with the White's all-metals detector to determine if any metallic items remain. The process was repeated until no metallic items were detected. The clearance depth of intrusive investigation was to 1 foot bgs.

4.3.2 Inspecting Existing Vegetation Piles

Vegetation piles were present within the initial 5-acre work area from grubbing activities prior to finding the DMM. Each of the piles was carefully inspected by UXO Technicians to ensure that MEC/MPPEH was not present prior to removal of the piles from the site. UXO Technicians performed visual inspection of the vegetation piles in lifts and were assisted by White's hand held all-metals detectors. Vegetation that was inspected was relocated and stockpiled for later removal by the JAA construction contractor.

4.3.3 MEC/MPPEH Storage

During Phase I, recovered MEC/MPPEH that was safe to move was stored in Building 365, the existing earth covered explosive magazine.

During Phases II and II, recovered MEC/MPPEH that was safe to move was stored within a portable Type 2 high explosive (HE) storage magazine, due to Building 365 being demolished in November 2007. The Type 2 HE storage magazine was a skid-mounted 5.5-foot by 5-foot by 5-foot box Type 2 magazine. The storage magazine was installed in accordance with the project Work Plans and ESSs/ESPs and secured within a fence. For lightning protection, the storage magazine was properly grounded and tested by a certified electrician to assure resistance value was below 25 ohms.

4.4 Relative Effectiveness, Limitations, and Residual Risk

4.4.1 Relative Effectiveness

Within the footprint of the MRA, the "Selected Response" was effective in addressing the explosive safety risks. Each detected anomaly potentially representing a MEC/MPPEH hazard was manually investigated, metallic item(s) removed, and the process repeated until no metallic items were detected. The clearance depth of intrusive investigation was to 1 foot bgs.

4.4.2 Limitations

Although rigorous QC was implemented, analog detection method relies on user technique and skill to be performed properly. Targets are identified and documented by the equipment operator in real time. QC is designed and implemented to reduce human error. QC of analog method is done through visual observation and additional sweeps by QC personnel.

4.4.3 Residual Risk

There could be residual risks remaining at the MRA below the clearance depth of 1 foot bgs and/or outside the final MRA boundary. Based on the risk ranking in NOSSA Instruction (NOSSAINST) 8020.15D, the ranking is considered "negligible" (Mishap Probability D, Hazard Severity IV) to a depth of 1 foot bgs. The scope of the "Selected Response" was to remove MEC from 0 to 1 foot bgs by an analog detection method. As such, anomaly detection relied on the limitations of the detection method and detection depth of analog detection equipment, and there is a slight possibility MEC/MPPEH could not have been detected and remains at the site.

4.5 Rationale for Variations to the Approved ESS

Changes in implementation of the MR were documented in the approved ESS and ESS Revisions, Amendments and Corrections. Additional variations in execution are as follows:

- The Naval Air Station Jacksonville Defense Reutilization and Marketing Office declined acceptance and management of MDAS removed during Phases I, II, and III. Based on this, final disposition/ destruct for the MDAS removed during Phases I and II was performed at the Chesapeake Metals, Inc. facility and the Smith Iron facility located in Richmond, Virginia. Final disposition/ destruct for the MDAS removed during Phase III is pending disposition of MDAS removed from the Hangar 860 MRA to be completed under separate contract (See Section 3.0).
- The initial 5-acre site boundary and operational grid system were emplaced by a local PLS. Due to the frequent expansion of the work areas needed because of MEC/MPPEH finds, subsequent expansion boundaries and operational grid systems were emplaced by the UXO subcontractor survey team to provide flexibility. Also, a site survey of the final MRA boundary was not completed due to development of the area by JAA. The re-development of the area resulted in the inability to confirm by survey or visually the site boundary.
- No additional operational grids were completed to the south of Row EX due to the presence of the existing impervious surface and taxiways associated with the airfield.

5.0 Quality Control Assessments

5.1 Quality Control Implementation

An extensive QC program was applied to the project and, in particular, to the field operations in accordance with the project Work Plans and ESSs. QC was implemented strictly through the establishment of QC tests with acceptance and failure criteria, and monitoring of those items by CH2M HILL's UXO Quality Control Specialist (UXOQCS).

QC was monitored through the Definable Features of Work (DFOW) using a three-phase control process. The UXOQCS was responsible for ensuring that the three-phase control process, including the Preparatory Phase, Initial Phase, and Follow-up Phase, was implemented for each DFOW listed in the QC Plan, regardless of whether it was performed by CH2M HILL or its subcontractors. Each control phase was important for obtaining a quality product and meeting the project objectives; however, the preparatory and initial controls were particularly valuable in preventing problems. Documentation of the three phases of control is in the CQCRs for the project. Completion of each grid is documented on Anomaly Investigation Dig Sheets.

5.2 Quality Assurance Implementation

No independent Quality Assurance (QA) oversight was performed as intended by the Navy Region Southeast Explosive Safety Officer due to availability. A QA audit was performed by NOSSA to validate that the work was done in accordance with the ESS(s) (see Section 5.3).

5.3 NOSSA Inspection and Findings

In accordance with NOSSAINST 8020.15B (in effect at the time of MR execution), NOSSA performed an audit to assess the extent to which the project complied with applicable explosives safety, environmental, and other requirements related to the management of MEC and MPPEH. Although the project was found to be compliant and managed in a safe and effective manner, a number of findings were noted.

An audit response with root cause analyses and corrective actions for each of the findings was submitted to NOSSA, and immediate actions were taken on all of the findings following the NOSSA audit to ensure compliance with Navy explosives safety criteria.

6.0 Maps and Land Use

6.1 Maps

Figures 6-1 and 6-2 show the location of the former NAS Cecil Field in Jacksonville, Florida and the location of the Building 365 MRA within the former NAS Cecil Field, respectively. Figure 6-3 shows the final MRA site boundary and locations within the MRA from which MEC and/or MPPEH were removed. The clearance depth was to 1 foot bgs. Figure 6-3 also shows operational grids named, however not required to be completed. No additional operational grids were completed to the south of Row EX due to the presence of the existing impervious surface and taxiways associated with the airfield.

The total acreage for the Building 365 MRA is approximately 28.34 acres.

6.2 Munitions Response Site Land Use

Current and future land use of the property is industrial. The property has already been transferred from Navy control to the JAA. Figure 6-3 shows the current development of the area associated with the MRA.

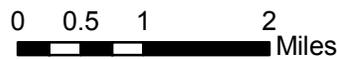
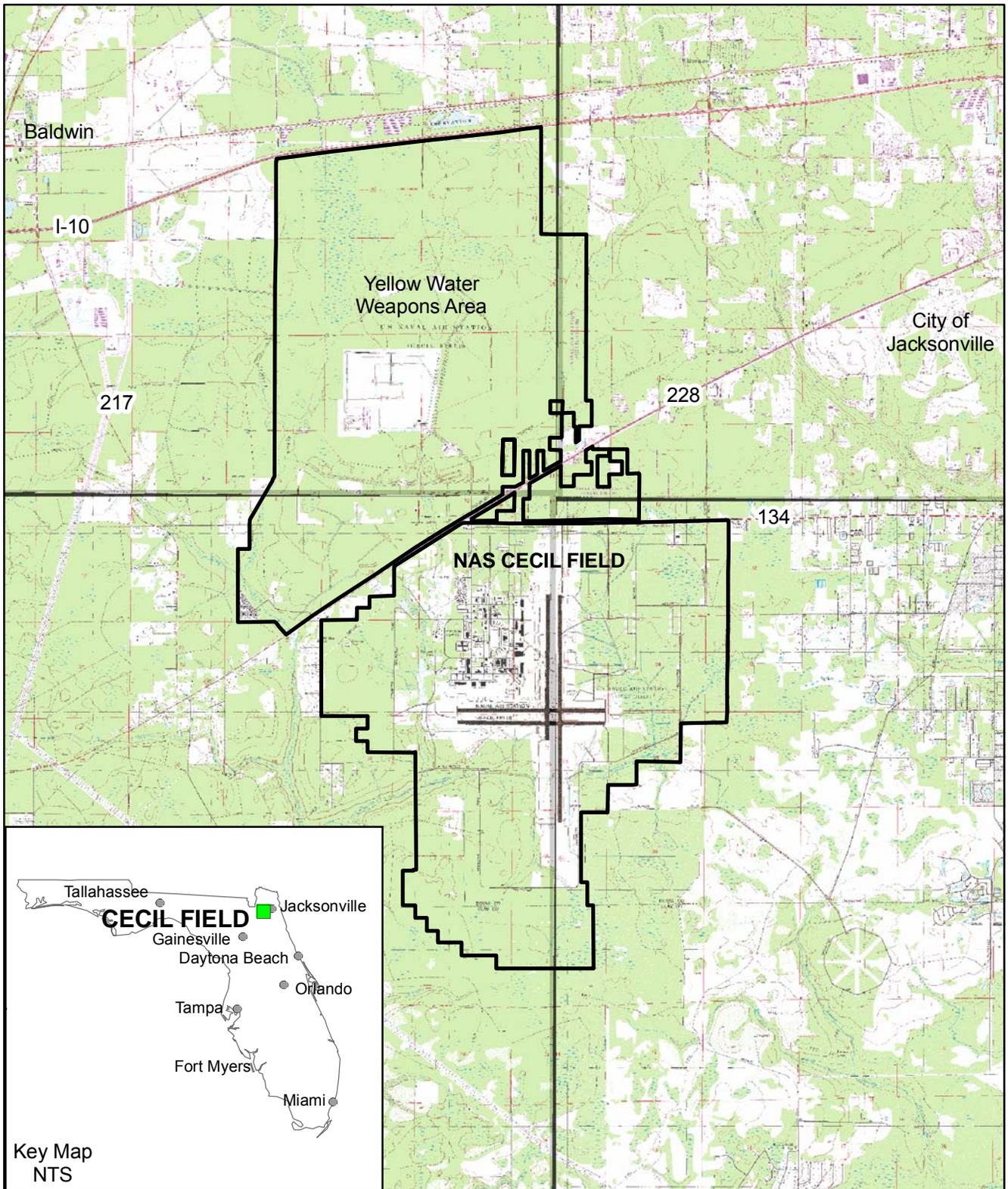
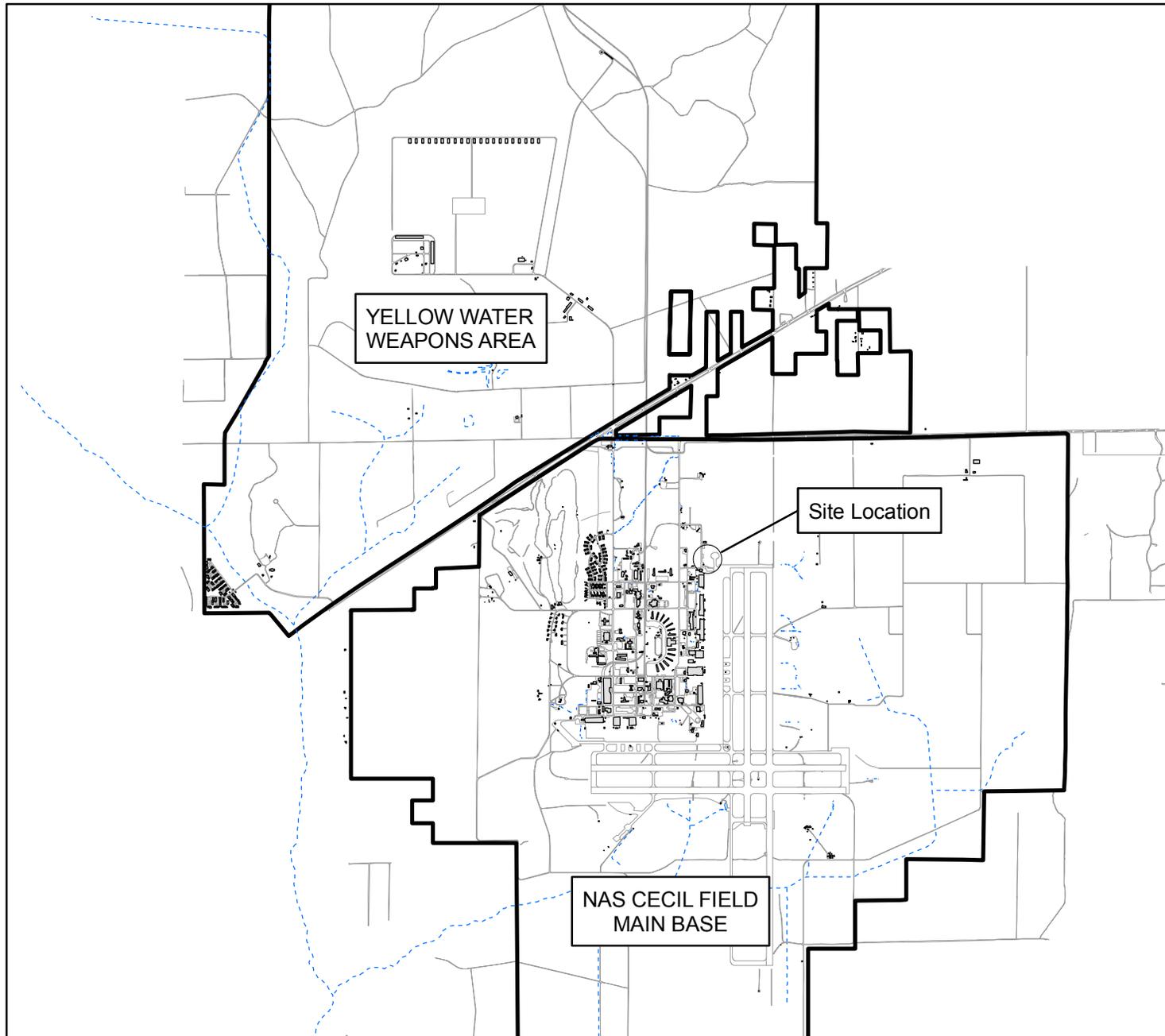


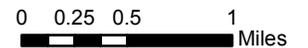
FIGURE 6-1
Regional Map of
Former NAS
Cecil Field

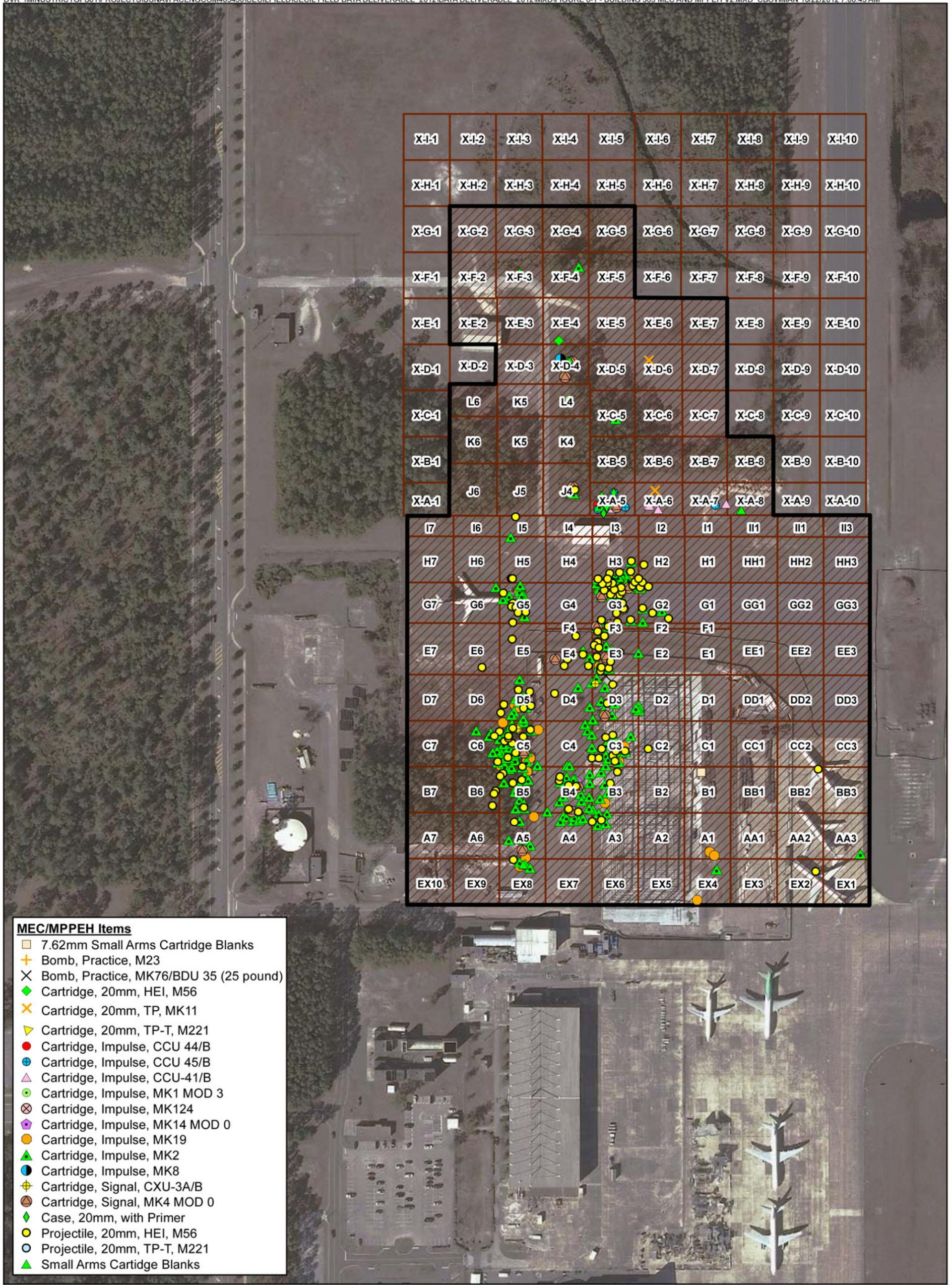
FIGURE 6-2
ACTIVITY MAP
NAS CECIL FIELD



Legend

-  Installation Area
-  Permanent Structure
-  Roads





- MEC/MPPEH Items**
- 7.62mm Small Arms Cartridge Blanks
 - ✦ Bomb, Practice, M23
 - ✕ Bomb, Practice, MK76/BDU 35 (25 pound)
 - ◆ Cartridge, 20mm, HEI, M56
 - ✕ Cartridge, 20mm, TP, MK11
 - ▶ Cartridge, 20mm, TP-T, M221
 - Cartridge, Impulse, CCU 44/B
 - ⊕ Cartridge, Impulse, CCU 45/B
 - △ Cartridge, Impulse, CCU-41/B
 - Cartridge, Impulse, MK1 MOD 3
 - ⊗ Cartridge, Impulse, MK124
 - ⬠ Cartridge, Impulse, MK14 MOD 0
 - Cartridge, Impulse, MK19
 - ▲ Cartridge, Impulse, MK2
 - Cartridge, Impulse, MK8
 - ⊕ Cartridge, Signal, CXU-3A/B
 - ⊗ Cartridge, Signal, MK4 MOD 0
 - ◆ Case, 20mm, with Primer
 - Projectile, 20mm, HEI, M56
 - Projectile, 20mm, TP-T, M221
 - ▲ Small Arms Cartridge Blanks

- Legend**
- Grid
 - ▨ Completed Grid
 - ▭ Final MRA Boundary

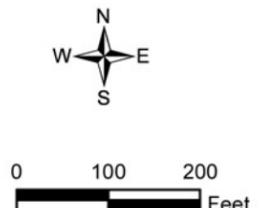


Figure 6-3
MEC/MPPEH Removal Area
Building 365 Munitions Response Area
Former NAS Cecil Field
Jacksonville, FL

7.0 Land Use Controls

Future land use of the property is industrial. The property has already been transferred from Navy control to the JAA. No land use controls on the MRA are required.

8.0 Summary of Provisions for Long-Term Management

For future intrusive activities to a depth of greater than 1 foot bgs within the MRA, UXO construction support is recommended.

9.0 References

The following references were consulted and used to prepare this After Action Report. Not all are cited in the text.

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