

Final

**Munitions Response Third-Party Quality Assessment
Quality Assurance Summary Report for
the Remedial Investigation Transfer Parcel XVI
Paint Waste Area and Vicinity
Former Mare Island Naval Shipyard
Vallejo, California**

March 2015



Prepared for:

**Department of the Navy
Base Realignment and Closure
Program Management Office West
San Diego, California**

Prepared by:

**Environmental Cost Management, Inc.
3525 Hyland Ave, Suite 200
Costa Mesa, California**

Prepared under:

**Naval Facilities Engineering Command Southwest
Contract Number N62473-13-C-2405
DCN: ECM-2405-0000-0005**

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Quality Assurance Summary Report for
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Paint Waste Area and Vicinity
Former Mare Island Naval Shipyard
Vallejo, California**

Submitted by:
Environmental Cost Management, Inc.



Signature
Donald L. Stevens
Name

October 1, 2014
Date
ECM Project Manager
Title



Signature
John McCormick
Name

October 1, 2014
Date
MEC Quality Assurance Specialist
Title



Signature
Roark W. Smith
Name

October 1, 2014
Date
CA Certified Geophysicist
Title

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ABBREVIATIONS AND ACRONYMS

| | |
|-----------------|---|
| BIP | blow in place |
| CE2-Kleinfelder | CE2-Kleinfelder Joint Venture |
| DGM | digital geophysical mapping |
| DQO | data quality objective |
| ECM | Environmental Cost Management, Inc. |
| ESQD | Explosive Safety Quantity Distance |
| ESS | Explosives Safety Submission |
| GPS | global positioning system |
| IVS | Instrument Verification Strip |
| MC | munitions constituents |
| MEC | munitions and explosives of concern |
| MGFD | munition with the greatest fragmentation distance |
| MINS | Former Mare Island Naval Shipyard |
| mm | millimeter |
| MPPEH | material potentially presenting an explosive hazard |
| MRS | Munitions Response Site |
| mV | millivolt |
| Navy | Department of the Navy |
| NOSSA | Naval Ordnance Safety and Security Activity |
| PWA | Paint Waste Area |
| PWA/V | Paint Waste Area and Vicinity |
| QA | quality assurance |
| QAIPP | Quality Assurance Implementation Project Plan |
| QC | quality control |
| RI | Remedial Investigation |
| SOP | standard operating procedure |
| SU | survey unit |
| SUXOS | Senior Unexploded Ordnance Supervisor |
| TCRA | Time-Critical Removal Action |
| UXO | unexploded ordnance |
| UXOQC | unexploded ordnance quality control |
| UXOQCS | Unexploded Ordnance Quality Control Specialist |
| UXOSO | Unexploded Ordnance Safety Officer |
| Weston | Weston Solutions, Inc. |

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1.0 INTRODUCTION

Environmental Cost Management, Inc. (ECM), under Department of the Navy (Navy) Contract No. N62473-13-C-2405, was tasked to provide independent third-party quality assurance (QA) oversight services during the remedial investigation (RI) within the Paint Waste Area (PWA) and Vicinity (PWA/V), located at the former Mare Island Naval Shipyard (MINS), Vallejo, California. The RI was conducted by CE-2 Kleinfelder's subcontractor, Weston Solutions, Inc. (Weston).

This report discusses the QA oversight activities that ECM conducted during the RI at the PWA/V site from May 19 through June 30, 2014. A total of 10 QA days were logged to complete this effort. The Navy tasked Weston with performing digital geophysical mapping (DGM) surveys, investigating selected targets, and conducting trenching operations to determine the extent of potential contamination. The requirements and activities for the MEC component of the RI are provided in the Remedial Investigation and Radiological Scoping Survey Work Plan (CE2-Kleinfelder, 2014) and Explosives Safety Submission (ESS), Amendment 1 (Weston, 2012).

The MEC QA Specialist followed the Navy-approved Quality Assurance Implementation Project Plan (QAIPP) (ECM, 2013) prepared under Contract No. N62473-13-C-2405. The QAIPP is applicable to all third-party QA activities performed at former MINS, Vallejo, California, associated with the facility's Military Munitions Response Program. The QAIPP addresses the third-party QA objectives and describes the processes and organization necessary to ensure that all QA activities are performed in accordance with the Military Munitions Response Program for MEC and the scope of work for each identified site. The QAIPP was reviewed and it was determined that it was sufficient to cover most of the sites at the former MINS.

1.1 SITE DESCRIPTION AND BACKGROUND

The current designation for the Munitions Response Site (MRS) is the Paint Waste Area (PWA) and Vicinity, located on the former MINS, Vallejo, California (Figures 1 and 2). The PWA/V surrounds the original PWA time-critical removal action (TCRA) excavation area that was the subject of an earlier action described in the PWA After-Action Report (Weston, 2011) and TCRA Completion Report (Weston, 2013).

1.2 HISTORY OF MEC USE

Although there is no documented history of MEC use at the PWA/V, MEC items recovered during the 2007–2010 TCRA indicate that munitions items, as well as radiological items, may have been incidentally disposed of along with general debris in the late 1940s to early 1960. MEC, material potentially presenting an explosive hazard (MPPEH), and radiological items have been encountered at depths of up to 5 feet below ground surface along with significant quantities of metallic debris throughout the PWA/V.

1.3 PREVIOUS STUDIES OF EXTENT OF MEC OR MPPEH CONTAMINATION

The Unexploded Ordnance (UXO) Site Investigation ([Supervisor of Shipbuilding, Conversion and Repair, Portsmouth, Virginia, Environmental Detachment, Vallejo, California, 1997](#)) included some exploratory geophysical surveys utilizing hand-held instruments in the general area of the PWA/V even though there was no prior known history of MEC-related uses or contamination. In 2010, a 20-millimeter (mm) projectile was encountered and removed during installation of a silt fence just outside the northern boundary of the PWA TCRA excavated area ([Figure 3](#)), inside the step-out area as described in the ESS First Amendment, Correction 1, approved in a letter from the Naval Ordnance Safety and Security Activity (NOSSA), Serial N537/1851, dated 30 October 2009. Radiological and DGM surveys were completed in 2010 as part of the PWA TCRA within areas designated as survey unit (SU)-9 and SU-10, which have now been included in the PWA/V MRS ([Figure 3](#)). Initial excavations at the PWA/V in September and October 2011 indicated that MEC and radiological items were present in areas also containing significant quantities of metallic debris.

2.0 PROJECT OBJECTIVE AND OPERATIONAL APPROACH

The following operational approach was implemented as described in the ESS, Amendment 1 (Weston, 2012) and Work Plan (CE2-Kleinfelder, 2014). If a UXO team member discovers a suspect MEC item, he or she will (1) call for a temporary work stoppage within the team's work area and (2) request that the Senior UXO Supervisor (SUXOS) identify and/or verify the identity of the item and the hazards associated with it. The SUXOS and UXO Safety Officer (UXOSO) will have ultimate responsibility for proper identification of the item and its condition, and only the SUXOS and UXOSO can declare that an item is acceptable to move. This determination will be documented in writing prior to movement. Suspect MEC items that are not deemed acceptable to move will be secured in place, and the SUXOS will coordinate treatment of the item with a donor charge using blow-in-place (BIP) procedures. If MEC is deemed acceptable to move, the UXO team may transport the item(s) to the collection point established at the site by the SUXOS for recovered MEC that are determined acceptable to move and are awaiting transport to the storage magazine. The temporary collection points will be under the control of the SUXOS until the item has been transported to the storage magazine at the end of the day. The purpose of the collection point is to facilitate tracking of smaller items that are not easily seen if left in place. The Explosive Safety Quantity Distance (ESQD) arc created by the net explosive weight for each collection point will not extend beyond that established for the site; movement of items away from the area where work is being conducted will allow site operations to continue.

Upon finding a MEC item, the UXO team will assign a unique name to each item found, take a digital photograph of the item, and record the item's approximate location on the MEC tracking log. The SUXOS will complete the MEC tracking log daily. MPPEH and scrap metal will be tracked by estimating the total weight of the items collected each day. The UXO team leader will document all information in a logbook and report pertinent information to the SUXOS for inclusion in the daily report. Information documented by the UXO team leader will include, at a minimum, the length, width, and depth of each excavation at the end of each day; the location(s) excavated; and a description of each MEC or MPPEH removed along with general descriptions and weight.

2.1 SCOPE AND OBJECTIVE OF QA SERVICES

The objective of this QA effort is to assess the Navy contractor's efforts in removing MEC/MPPEH from the PWA, MINS, Vallejo, California. The QA conclusions will provide a high degree of confidence that work performed by the Navy's contractor is in accordance with the applicable Work Plan and ESS. The Navy Remedial Program Manager uses the QA services to:

- Verify approved Standard Operating Procedures (SOPs) for geophysical surveys, data processing and management, conducting intrusive investigations, etc. are followed.

- Obtain objective evidence about the effectiveness of MEC/MPPEH removal operations.
- Observe and document any necessary on-site destruction/detonation of MEC.
- Assure an audit trail of data is collected, documented, and maintained.
- Document and preserve the Quality Assessment data gathered during this project.

3.0 QUALITY ASSURANCE OVERSIGHT AND ACTIVITIES

The MEC QA Specialist performed the following QA activities throughout the duration of field activities performed by CE-2 Kleinfelder’s subcontractor, Weston, at the MINS PWA/V site:

- Assessed the contractor field teams’ overall explosive management program.
- Assessed the contractor’s field activities using their site-specific SOPs.
- Assessed the contractor’s personnel qualifications.
- Assessed the MEC and geophysical quality control (QC) program, including on-site procedures, activities, and documentation by the UXO QC Specialist (UXOQCS).
- Implemented the QA blind seed program. Manufactured blind seeds per instructions contained in ESS, Amendment 1 (Weston, 2012) and QAIPP (ECM, 2013).
- Assessed the detection of anomalies and removal of MEC/MPPEH.
- Performed QA inspections of no less than 10 per cent of all investigated targets.
- Assessed disposal demolition procedures.
- Assisted with procedures for correcting deficiencies.

All QA oversight activities were performed in accordance with the QAIPP (ECM, 2013). The following subsections discuss each of the QA oversight activities listed above.

3.1 CONTRACTOR EXPLOSIVES MANAGEMENT PROGRAM

The MEC QA Specialist conducted oversight inspections at the onset of field activities and periodically throughout the course of the project to evaluate the compliance of the contractor’s explosives management program with the requirements of the Work Plan, including documentation, QC, and site health and safety.

Initial QA inspections focused on whether the contractor’s personnel performing UXO clearance and DGM surveys were in compliance with the requirements of the project Work Plan (CE2-Kleinfelder, 2014) and the ESS, Amendment 1 (Weston, 2012). QA inspections also focused on the qualifications and certifications of the contractor’s personnel. Field observations were made and inspections were conducted periodically by the MEC QA Specialist.

The QA Compliance Inspections were documented on the QA Compliance Checklist as well as the Daily Reports as indicated in the QAIPP (ECM, 2013). A completed QA Compliance Checklist is presented in Appendix A. Field QA Daily Reports are presented in Appendix D. QA Audits of project plans and field documentation and inspections of field operations were also conducted and documented on the Field QA Daily Reports provided in Appendix D. “Blind seeds” were utilized by both the QC personnel and the MEC QA Specialist to document the success of removal actions. The QA Blind Seed Log is presented in Appendix E.

3.2 CONTRACTOR FIELD ACTIVITIES

The QA Field Oversight Summary ([Table 2](#)) contains a list of the areas that the MEC QA Specialist observed during project operations performed by CE2-Kleinfelder's subcontractor, Weston. The table contains the definable features of work and the related references, methods of surveillance, and the QA documentation used.

The MEC QA Specialist observed how the following field equipment functioned: (1) hand-held detectors and the EM61-MK2 at the geophysical test strip, and (2) global positioning units (GPS) at the predetermined control point. The MEC QA Specialist observed that Weston personnel regularly checked their equipment and that they were thoroughly trained on their respective equipment prior to operations. The MEC QA Specialist noted in the checklists and Field QA Daily Reports ([Appendix D](#)) that equipment was operated properly during the QA inspections and field activities.

3.3 CONTRACTOR PERSONNEL QUALIFICATIONS

Prior to the start of fieldwork, the MEC QA Specialist reviewed the personnel requirements and certifications of all field personnel to ensure compliance with the requirements of the contract and the Work Plan ([CE2-Kleinfelder, 2014](#)). No deficiencies were found during these reviews.

3.4 MEC AND GEOPHYSICAL QC PROGRAM

During the field investigation, ECM performed follow-up QA inspections and observations of geophysical surveys, including installation of the Instrument Verification Strip (IVS) and performance and documentation of the unexploded ordnance quality control (UXOQC) procedures ([Weston, 2012](#)). As specified in the QAIPP ([ECM, 2013](#)) inspections and observations were documented on the Field QA Daily Report ([Appendix D](#)), which includes the MEC activity being performed, location being observed, and inspection and observation results. The MEC QA Specialist ensured project compliance during the following field activities:

- Implementation of safe work practices when locating and removing MEC
- Use of appropriate personal protective equipment
- Use of proper equipment (e.g., EM61, GPS, Schonstedt, Vallon etc.)
- Implementation of MEC avoidance procedures
- Recovery of QA and QC blind seeds
- Operation of heavy equipment
- Storage and disposition and demolition of MEC and MPPEH
- Tracking and documentation of MEC and MPPEH

Geophysical instrumentation was checked at the IVS every morning prior to work commencing. Geophysical instruments that were operated by Weston were determined to be operating properly during the project.

The MEC QA Specialist also observed UXOQC meetings and inspections before and during field activities and recorded the information on the Field QA Daily Reports provided in [Appendix D](#). The MEC QA Specialist performed inspections to confirm that Weston personnel conducted QC follow-up inspections of field activities to identify items excavated during intrusive activities. Inspections were also performed by the MEC QA Specialist to ensure that UXOQC procedures implemented by Weston complied with the QA/QC procedures found in the Work Plan ([CE2-Kleinfelder, 2014](#)). The Weston UXOQC program was found to be in full compliance once the two non-conformance notes were submitted and approved. It was necessary to submit the two non-conformance notices ([Appendix B](#)) as the project Work Plan had been approved for work at the PWA and did not take into consideration that the scope of work for the RI at the PWA/V was different.

Advanced Geological Services was separately subcontracted by ECM to review DGM data processes and procedures. The DGM summary report is contained in [Appendix C](#).

3.5 BLIND SEED PLACEMENT AND RECOVERY

The QA blind seed program is a QA process in which QA personnel strategically emplace simulated UXO items within the project production area to test and confirm complete area coverage by geophysical and MEC teams and verify the quality of the detection process. The validity of blind seeding as a QA tool is based on assumptions that seed items will accurately mimic the munition with the greatest fragmentation distance (MGFD) to be found in the field.

The blind seed placement and recovery program included the placement of two separate sets of blind seeds, one placed and implemented by the UXOQCS and the other placed and implemented by the MEC QA Specialist. The MEC QA Specialist tracked the QC blind seed program and documented the results in the Field QA Daily Report ([Appendix D](#)) and the QA Blind Seed Log ([Appendix E](#)). Weston planned, documented, and controlled the QC blind seeding action, which was monitored and observed by the MEC QA Specialist.

Not all QC and QA blind seeds were discovered by Weston's geophysical personnel during the target selection process. The nonconforming conditions and corrective actions taken are documented by non-compliance notice 2229-CTO002-001 ([Appendix B](#)) and the Blind Seed Log ([Appendix E](#)). Three out of eight blind QC seeds located in dense anomaly areas were not picked as targets of interest for intrusive investigation. Further investigation indicated that the responses from these seeds (reported in millivolts [mV]) were masked by high-mV responses returned by a nearby linear feature (two seeds) and an unknown source (one seed). When a target response was determined to be a pick and subsequently selected as a target to be investigated, the UXO intrusive teams successfully recovered all blind seeds.

Failure to place blind seeds within the investigation trench footprint on a daily basis represented a second nonconforming condition. Non-compliance notice 2229-CTO002-002 was issued because the UXOQCS failed to place blind QC seeds within the investigation trenches from June 18 through 24, 2014, as the result of an oversight. Blind QC seeding was immediately implemented after the non-compliance was recognized and continued throughout the remainder of the field work.

3.6 DETECTION AND REMOVAL OF ANOMALIES

The MEC QA Specialist performed a QA inspection and oversight of Weston personnel performing intrusive operations and found that once a selected target was investigated it was clear of anomalies. The MEC QA Specialist performed six QA inspections during conduct of intrusive investigations and observed that Weston's personnel properly conducted intrusive operations and properly characterized items that were excavated.

There were no MEC/munitions-related MPPEH items discovered during RI intrusive operations conducted within the PWA/V.

3.7 CORRECTIVE ACTIONS

As discussed in Section 3.5, the MEC QA Specialist reported that three seeds were not picked as targets for intrusive investigation because their responses were masked by high-mV responses associated with a liner feature and other unknown source. The sources of the high-mV responses were not visible on the surface and were not detected by the hand-held magnetometer used to clear the area for seed placement. UXO technicians removed the three blind seeds.

The failure to select three seeds for intrusive investigation is documented in non-compliance notice 2229-CTO002-001 ([Appendix B](#)). Causal analysis indicated that during a removal action, the high-mV response areas would be further investigated, and items with low-mV responses would be found and recovered during excavation. Additional corrective action regarding anomaly selection was not deemed necessary to meet the objectives of this RI. The finding and causal analysis indicate that application of the blind seeding program should be evaluated to optimize results for each definable feature of work prior to initiation of operations based on specific site conditions.

Non-compliance notice 2229-CTO002-002 ([Appendix B](#)) was issued because the UXOQCS failed to place blind QC seeds within the investigation trenches on a daily basis from June 18 through 24, 2014. The requirement was not specified in the Work Plan or ESS, but in a SOP contained in the Sampling and Analysis Plan. The topic was discussed during the preparatory QC phase meeting, but not reviewed on the day that trench investigation began. Blind QC seeding was immediately implemented after the non-compliance was recognized and continued throughout the remainder of the field work. UXO technicians were able to locate the QC seeds during the anomaly investigations with hand-held geophysical instruments.

The causal analysis determined that the oversight resulted from the project team's failure to carefully read the Work Plan and Sampling and Analysis Plan prior to undertaking each definable feature of work. The corrective action required review of all sections of relevant planning documents as part of the initial inspection. In addition, a trench seed tracking form was prepared to assist the UXOQCS to place and track QC seeds according to project requirements. Additional corrective action was not implemented for the excavated material. Soil already removed from the trenches during the period that blind seeding was not utilized was inspected visually and using an all-metals detector and a magnetometer to identify metallic objects. Daily instrument inspections and function checks were conducted at the IVS each day that trenching

operations were completed. The hand-held detectors identified the QC seeds placed within the trenches once the blind seeding program was implemented, indicating that these instruments had been capable of locating metallic objects within the excavation area during the period blind seeds were not used.

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4.0 DIGITAL GEOPHYSICAL MAPPING QUALITY ASSURANCE

ECM partnered with Advanced Geological Services (AGS) to provide QA of DGM activities. Mr. Roark Smith, a registered California Geophysicist, of AGS, and the MEC QA Specialist evaluated the field QC procedures and activities performed by CE-2 Kleinfelder's subcontractor, Weston. Weston collected site-specific data to comprehensively analyze the entire digital geophysical survey including data acquisition, processing, and interpretation. The following digital geophysical activities were monitored:

- Operator performance
- Equipment performance
- Operator and equipment procedures
- Anomaly detection to depths of concern
- Removal of targets of interest

The following subsections discuss monitoring of operator performance and acquisition of digital field data.

4.1 Operator Performance

The QA Geophysicist evaluated Weston's geophysical instrument operators by observing their instrument operation, data acquisition, and reacquisition procedures. Geophysical data processors were evaluated by analyzing the quality of the data processing, as shown in the processed data files, and the target selection and interpretation results listed in the dig sheets. [Appendix D](#) contains detailed results of the operator performance auditing. Operator performance was very good and in accordance with contract requirements ([Appendix C](#)).

4.2 Digital Field Data Acquisition

The QA Geophysicist evaluated the acquired and processed data. The data were evaluated for the following issues:

- Data gaps along survey lines
- Unreasonable data (e.g., systematic "spikes" or noise)
- Data incongruity across survey grids
- Inadequate data density along survey traverse
- Lack of accurate, precise locations; survey line orientation
- Inadequate and incomplete site survey coverage
- Missing, incomplete, or noncompliant instrument standardization checks

At the completion of data evaluation activities, the QA Geophysicist sampled 100 percent of the data by generating their own contour maps and inspected 10 percent of Weston's DGM data in profile format and prepared a report of the results of that sampling. This report is attached as [Appendix C](#), and contains detailed results of digital field data acquisition and processing inspection. The results indicate that the DGM survey covered approximately 99.8 percent of the PWA/V site. Data quality was good as indicated by repeatability of the IVS data, correlation between spike responses and seeded item locations along the IVS test line, symmetrical anomaly response curves, and nature of the background data. The target picking interpretation process was thorough and accurately performed given the noise sources. In conclusion, the contractor achieved the project goal of obtaining and interpreting data to provide the Navy a high degree confidence that the PWA/V site was adequately characterized with respect to potential MEC/MPPEH items within the detection limits of the EM61-MK2 instrument.

5.0 QUALITY ASSURANCE CONCLUSIONS

Third-party QA oversight of RI field activities was performed to the requirements specified in the QAIPP (ECM, 2013) to ensure that all work conducted by CE-2 Kleinfelder's subcontractor, Weston, within the PWA and Vicinity was in compliance with the Work Plan (CE2-Kleinfelder, 2014) and ESS, Amendment 1 (Weston, 2012). Specific field activities performed included vegetation removal, DGM within the PWA/V, trench surveys, excavation and removal of anomalies, UXOQC activities, and discovery of QA and QC blind seeds.

Based on observations made during third-party QA oversight and QA inspections of no less than 10 percent of each grid, Weston conducted field activities in compliance with the project documents, including the data quality objectives (DQOs) presented in Table 1, with the exception of blind seed recovery. Some blind seeds were not selected for intrusive investigation based on their proximity to site features that produced large, masking responses. In addition, QC blind seeds were inadvertently not placed within the excavation trenches for a seven-day period. The following paragraph includes the corrective action resulting from this QC blind seed failure.

After discussion with all parties, corrective action was not deemed necessary to meet RI project objectives in the case of QA seed items not being picked for intrusive investigation, because these areas would be subject to further investigation in any removal action, and the anomalies would be discovered during intrusive investigation. In the case of failure to place blind QC seeds within excavation trenches, the blind seed program was implemented immediately upon discovery of the oversight. A form was developed to assist tracking of blind seeds and corrective action was implemented to ensure that planning documents are reviewed during initial inspection to identify all project requirements. Corrective action was not deemed necessary to meet project objectives for soil removed from the trenches during the period when QC blind seeding was not implemented. The excavated soil was inspected visually and using an all-metals detector and a magnetometer to identify metallic objects. Instrument inspections and function tests conducted at the IVS each day trenching activities occurred ensured hand-held instruments were operating properly. Hand-held detectors identified the QC seeds placed within the trenches after implementation of the QC blind seed program, indicating that these instruments had been capable of locating metallic objects within the excavation area during the period blind seeds were not used. Therefore, the ultimate goal of the trenching operations was not compromised.

All other inspections and audits of the RI contractor's work resulted in acceptable performance and quality standards on the project; therefore, no other corrective actions were required. The Weston UXOQC program was found to be in full compliance once the two non-conformance notes were submitted and approved.

Based on observations and activities on the project site, investigation and removal activities are complete and no further QA action is required within the PWA/V as part of the RI under this contract.

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6.0 REFERENCES

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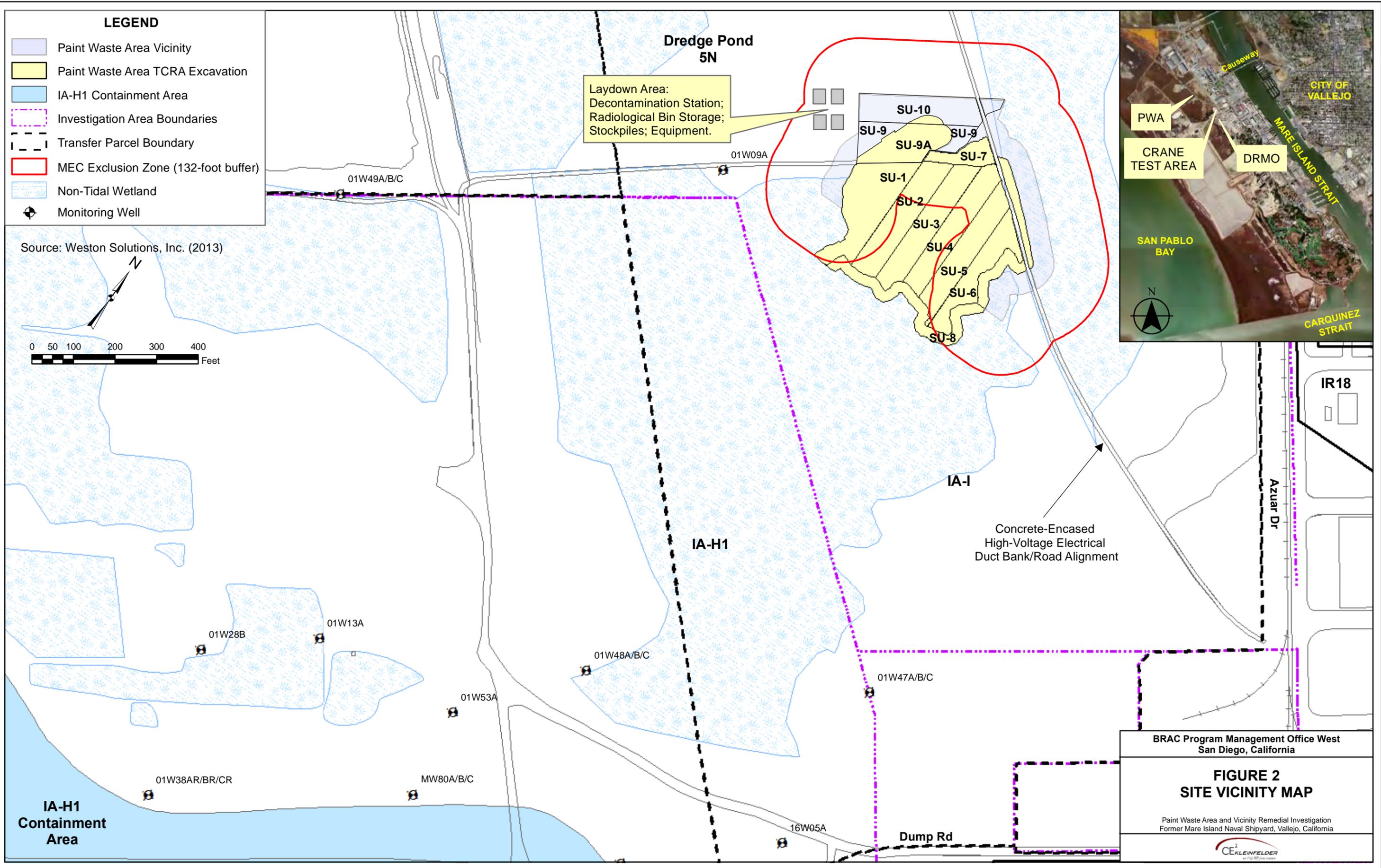
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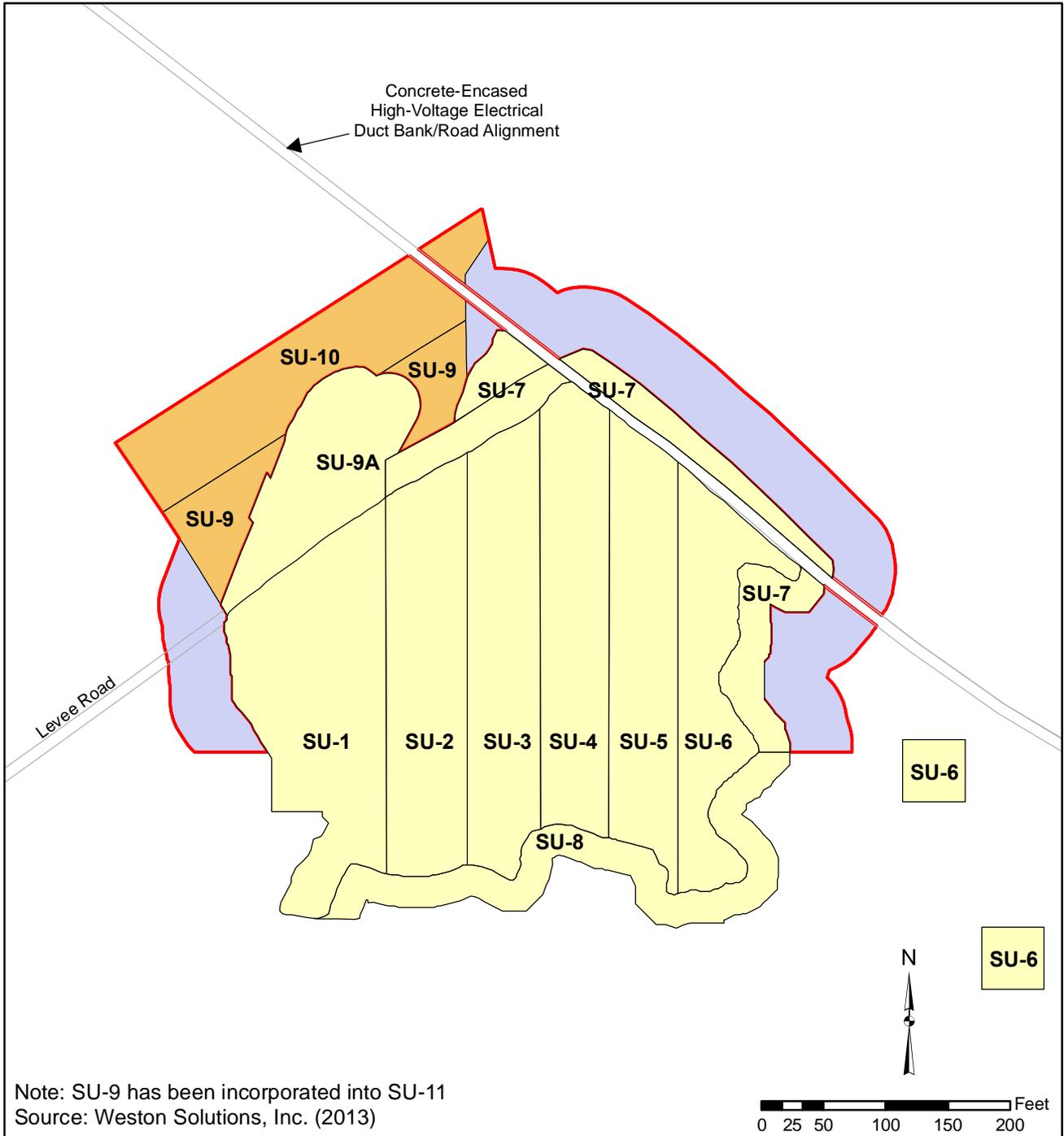
FIGURES

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Source: Weston Solutions, Inc. (2013)





- LEGEND**
- Paint Waste Area TCRA Excavation
 - 2010 Geophysical and Radiological Surveys
 - Planned Geophysical and Radiological Survey Area
 - Paint Waste Area Vicinity Boundary

**BRAC Program Management Office West
San Diego, California**

**FIGURE 3
SITE FEATURES MAP**

Paint Waste Area and Vicinity Remedial Investigation
Former Mare Island Naval Shipyard, Vallejo, California



TABLES

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Table 1. Data Quality Objectives

| What is the DQO? | How Was It Assessed? | Was the DQO Met? |
|--|--|-------------------------|
| 1. Assess the contractor field teams' overall explosive management program | All available documentation for the project was reviewed. | Yes |
| 2. Assess the contractor's field operations using their site specific SOPs. | A QA Review was prepared and completed to evaluate the SOPs and ensure that they were implemented properly. | Yes |
| 3. Assess the contractor's personnel qualifications | Personnel qualifications were reviewed prior to field activities. | Yes |
| 4. Assess the MEC and geophysical QC program and onsite procedures, activities, and documentation for UXOQC. | Construction and functionality of the geophysical test strip was observed and verified by the MEC QA Specialist. | Yes |
| 5. Assess the detection of anomalies and removal of MEC. | The MEC QA Specialist, planned, implemented, and tracked the blind seed action. | Yes |

Notes:

DQOs – data quality objectives
 MEC– munitions and explosives of concern
 QA – quality assurance
 QC – quality control
 SOP – standard operating procedure
 UXOQC – unexploded ordnance quality control

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Table 2. QA Field Activity Outline

| Definable Feature of Work | Reference ^{1,2} | Oversight Method | Documentation | Performance Indicators |
|--|------------------------------------|---|--|--|
| Work Plan Execution | Work Plan | Initial Compliance Periodic Field Follow up Inspection | QA Inspection/Daily Report | Compliance with approved plans Personnel knowledgeable of plan requirements Personnel meet qualifications Resources managed effectively |
| QC | Work Plan | Periodic Review of QC Documentation | QA Inspection/Daily Report | Pass/fail rate on QC inspections Root cause analysis and correction process Blind seed recovery rate |
| Anomaly and Intrusive Investigation Operations | Work Plan | Periodic Field Inspections Observations | QA Inspection/Daily Report | Safe work practices for MEC Anomaly recovery per the Work Plan and ESS |
| Anomaly Detection Confidence | Blind Seeding Action | Area Seeded Recorded and Tracked as Discovered | QA Seed Tracking Log/ Daily Report | All blind seeds recovered – pass One or more missed – fail, evaluation and corrective action recommended |
| Blast and Fragmentation Protection | Work Plan ESS DoD 6055.9-STD | Periodic Field Inspections Observations | QA Observations/ Daily Report | Appropriate EZ's maintained Nonessential personnel not within the EZ Engineering controls used Demolition per ESS |
| MPPEH Handling | Work Plan Dod 6055.9-STD | Daily Observations | Daily Report | No non MEC items commingled with MEC Security of certified MDAS containers Demilitarization complete |

Notes:

1. Weston – Explosives Safety Submission, Remedial Investigation, Transfer Parcel XVI Paint Waste Area Vicinity, Amendment 1, Former Mare Island Naval Station Vallejo, California. February 2012.
2. DoD, 2004. DoD Directive 6055.9, “DoD Ammunition and Explosives Safety Standards.” October. Available Online at: <http://www.ddesb.pentagon.mil/DoD6055.9-STD%205%20Oct%202004.pdf>.

DoD – U.S. Department of Defense

ERRG – Engineering/Remediation Resources Group, Inc.

ESS – explosives safety submission

EZ – exclusion zone

MEC – munitions and explosives of concern

MDAS – material documented as safe

MPPEH – material potentially presenting an explosive hazard

QA – quality assurance

QC – quality control

SOP – standard operating procedure

APPENDIX A
QA COMPLIANCE CHECKLIST

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Project: QAIPP for Munitions Response 3rd Party QA
 Contract: N62473-13-C-2405
 Location: Former Mare Island Naval Shipyard, Vallejo, CA
 Prepared by: John McCormick

Environmental Cost Management, Inc.

QA Compliance Check List

Date: 06/30/2014

Site Name: Mare Island PWA

| 1. Project Documents: WP, SAP/QAPP, ESS, APP/SSHP | Yes | No | N/A | Comments |
|---|------------|-----------|------------|---|
| a. On site and signature page signed | X | | | |
| b. Check for modifications/changes and up to | X | | | |
| c. Proper depth of clearance identified | X | | | |
| d. Corrective action standards established | X | | | |
| e. Proper target ordnance identified/test sources/ test plot established | X | | | Contractor Installed an IVS using the proper ISOs |
| f. Most Probable Munitions (MPM) identified | X | | | |
| g. MSD established | X | | | |
| h. Standards for turn-in of recovered MPPEH and range-related debris | X | | | |
| i. Exclusion Zone (EZ) identified | X | | | |
| 2. Documentation Requirements/Publications Available On Site | Yes | No | N/A | Comments |
| a MRS Self-Assessment Checklist, evaluation completed by the Contractor's Project Manager and SUXOS the first week of field activities. NOSSAINST 8020.15C | | | X | |
| b Notice to Proceed from client | X | | | |
| c Contractor personnel qualifications and supporting certifications for all UXO personnel verified, e.g., EOD certification, equipment certifications, etc. | X | | | |
| d Certificate of grounding, lightning protection for magazines (if required) | | | X | |
| e Approval letter, MSD 1/600 (if required) | | | X | |
| f Explosive Safety Submission (ESS) (if required) | X | | | |
| g Delivery order & all modifications & Change Orders | X | | | |
| h Explosives permits/license (if required) | X | | | |



Project: QAIPP for Munitions Response 3rd Party QA
 Contract: N62473-13-C-2405
 Location: Former Mare Island Naval Shipyard, Vallejo, CA
 Prepared by: John McCormick

Environmental Cost Management, Inc.

| | | | | |
|---|--|--|---|--|
| i Dig permits for utilities (if required) | | | X | |
| j Rights of Entry (ROE) (if required) | | | X | |

| 2. Documentation Requirements/Publications Available On Site (cont.) | Yes | No | N/A | Comments |
|--|------------|-----------|------------|---------------------------|
| k Current MEC SOPs, readily available | X | | | |
| l Other applicable reference publications/materials, readily available | | | | |
| 3. QC Files Established IAW, WP, SAP/QAPP | Yes | No | N/A | Comments |
| a. Daily/weekly QC reports/audits | X | | | |
| b. Weekly/monthly reports (if provided) | | | X | |
| 4. Accident Prevention Plan (APP) Site-Specific Safety & Health Plan (SSHP) | Yes | No | N/A | Comments |
| a. On site and signature page signed | X | | | |
| b. Hazard Analysis & Risk Assessment for all tasks & equipment | X | | | |
| c. OSHA physical on site and current | X | | | |
| d. Training: General site workers, HAZWOPER qualified, 40-hour HAZWOPER & current 8-hour refresher (if required) | X | | | |
| e. Personnel Protective Equipment (PPE) | X | | | |
| f. First Aid equipment shall be immediately available | X | | | |
| g. Emergency eye-washes/showers comply with ANSI standards | X | | | |
| h. Fire extinguishers (specify type, size, and location) | X | | | 1 ea 5 lb in each vehicle |
| i. Visitor safety briefing | X | | | |
| j. Emergency Notification List posted & available | X | | | |
| k. Emergency routes/maps available & issued to each team | X | | | |



Project: QAIPP for Munitions Response 3rd Party QA
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| | | | | |
|---|---|---|--|--|
| I. Work task identified in Activity Hazard Analysis (AHA) | X | | | |
| m. Current MSDS(s) on site | X | | | |
| n. Minimum of two personnel on site, First Aid/CPR trained, EM 385-1-1 | X | | | |
| o. 16-unit First Aid kits approved by a licensed physician in the ratio of 1 for every 25 personnel or less. EM 385-1-1 | | X | | |

| 4. Accident Prevention Plan (APP) Site-Specific Safety & Health Plan (SSHP) (cont.) | Yes | No | N/A | Comments |
|--|------------|-----------|------------|--------------------------------|
| p. Adequate means of reporting accidents/near misses to client | X | | | |
| 5. Facilities – Reference EM 385-1-1 | Yes | No | N/A | Comments |
| a. Adequate work space & facilities (restrooms, etc.) | X | | | |
| b. Good housekeeping (no fire hazards, tripping hazards, etc.) | X | | | |
| c. Approved and suitable containers for flammable, toxic, or explosive materials | | | X | |
| d. Approved/adequate explosive storage facilities | X | | | |
| e. Fire/emergency exits clear & unbarred. Fire extinguisher location(s), and route of escape posted as appropriate in facility | X | | | |
| f. Site security adequate | X | | | |
| g. Toilets IAW EM 385-1-1 | X | | | |
| h. Washing facilities IAW EM 385-1-1 | X | | | |
| 6. Equipment – Reference Approved WP/Manufacturers Operators Manual | Yes | No | N/A | Comments |
| a. Tools appropriate and serviceable | X | | | |
| b. Personnel Protective Equipment (PPE) present, serviceable & utilized | X | | | |
| c. Equipment calibrated (Last Cal. Date-----, Next Cal. Date-----) | X | | | Applied to radiation detectors |



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 Contract: N62473-13-C-2405
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| | | | | |
|--|---|--|--|--|
| d. Survey equipment inspected & serviceable | X | | | |
| e. Heavy equipment inspected & serviceable IAW EM 385-1-1, Section 16; include back up alarm and equipped with 1 fire extinguisher, 5-BC | X | | | |
| f. Competent person identified to inspect and accept Heavy Equipment IAW EM 385-1-1 | X | | | |
| g. Identified site vehicles are equipped with First Aid kits and a 5-BC fire extinguisher IAW EM 385-1-1 | X | | | |
| h. Geophysical equipment on hand & serviceable | X | | | |
| i. Two separate means of communication: radio(s)/cell phone, land line(s) | X | | | |

| 7. Explosive Storage/Receipt/Transportation Requirements – Reference NAVSEA OP 5, Volume 1 | Yes | No | N/A | Comments |
|---|------------|-----------|------------|-------------------------------|
| a. Proper storage containers Type 2 magazine(s) conforming to standards set | X | | | Never was used |
| b. Placards will be displayed on the magazine(s) IAW w/DOD 6055.9-STD, Chapters 2 & 3 for Hazard Division stored in the magazine(s) | | X | | They were available if needed |
| c. Explosive compatibility groups segregated into appropriate Hazards Divisions listed in Chapter 3, DOD 6055.9-STD | | | X | |
| d. Security locks for the magazine(s) shall meet the requirements listed in Section 55.208 (a) (4), ATFP 5400.7 | X | | | |
| e. Key control will be documented in the WP | | | X | Used combo lock |
| f. Lightning Protection System serviceable & tested (Test Date ____) | | | X | |
| g. Fire-fighting placarding will be posted on the fence (IAW DOD 6055.9-STD, Chapter 8 and NAVSEA OP 5, Volume 1 for Hazard Division stored in the magazine(s)) | | | X | |



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Environmental Cost Management, Inc.

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| | | | | |
|---|---|--|---|-----------------------|
| h. Fire protection consisting of extinguishers, 10-BC or larger located at magazine area & vegetation and trash cleared in and around magazine area | | | X | |
| i. Quantity distance from magazine IAW WP & Explosive Safety Submission (ESS) | X | | | |
| j. Accountability records maintained IAW 55.125, ATFP 5400.7 | | | X | |
| k. Explosive NEW limits do not exceed limits stated in the WP & ESS | | | X | |
| l. Licenses/permits (if required) | X | | | |
| m. Initial receipt procedures & documentation on site | | | X | No explosives delvr'd |
| n. Procedures for transportation of explosives IAW EM 385-1-1, and NAVSEA OP 5 Vol 1 | X | | | |
| o. Pre-operational checks of vehicle transporting explosives using checklist | | | X | |
| p. Cargo properly segregated, blocked, and in approved containers, NAVSEA OP 5, Vol 1 | | | X | |
| q. Receipt procedures accounting for each item of explosives/documentation on site | | | X | |
| r. Individuals authorized to receive, issue, and transport identified in writing | X | | | |

| 7. Explosive Storage/Receipt/Transportation Requirements – Reference NAVSEA OP 5, Volume 1 (cont.) | Yes | No | N/A | Comments |
|---|------------|-----------|------------|-----------------|
| s. Final disposition procedures documented | X | | | |
| t. Reconciliation, lost/stolen receipt documents/procedures on site | X | | | |
| u. Inventory conducted weekly @ minimum | | | X | |



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| 8. MEC Operational Plans –Approved WP, SAP/QAPP, ESS and APP/SSHP | Yes | No | N/A | Comments |
|---|-----|----|-----|------------------------------|
| a. Contractor following methodology defined | X | | | |
| (1) Daily safety meeting conducted by UXOSO | X | | | |
| b. Detection equipment used | X | | | |
| (1) Pre-operational checks performed prior to sweep operations | X | | | |
| (2) Operational condition annotated in log book | X | | | |
| (3) Team composition | X | | | |
| (4) Quality control | X | | | |
| (5) Quality control documentation | X | | | |
| c. Operational teams using approved procedures | X | | | |
| (1) SUXO conducted physical check prior to operations | X | | | |
| (2) Pre-operational/safety brief conducted | X | | | |
| (3) Individual sweep lanes marked IAW WP | | | X | Dug individual flagged Tgt's |
| (4) Contacts marked & investigated properly | X | | | |
| (5) Results of sweep operation recorded | X | | | |
| (6) All MEC, MD, MDEH and MPPEH is examined and positively identified by at least the SUXO and the UXOQCS | | | X | No MEC found |
| (6.1) Actions taken when MEC items identified are consistent with WP/MPM | | | X | No MEC found |



Project: QAIPP for Munitions Response 3rd Party QA
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| 8. MEC Operational Plans –Approved WP, SAP/QAPP, ESS and APP/SSHP (cont.) | Yes | No | N/A | Comments |
|---|------------|-----------|------------|-----------------|
| (7) All MEC/UXO clearly marked | | | X | No MEC found |
| d. QC operations IAW WP, and SAP/QAPP | X | | | |
| e. MPPEH inspected/vented/segregated | | | X | No MPPEH found |
| f. Geophysical test grids appropriate | X | | | |
| g. Project database and PDAs entries are consistent with intrusive results | X | | | |
| 9. Disposal Operations IAW WP, SAP/QAPP, ESS and 60-1-1-31 | Yes | No | N/A | Comments |
| a. Disposal method | | | X | |
| b. Adequate security for disposal operation | | | X | |
| c. Disposal Notification List available | | | X | |
| d. All necessary notifications made | | | X | |
| e. Movement of MEC items if determined safe to move to explosive storage or consolidate for disposal operations IAW project plans | | | X | |
| f. Are protective mitigation measures being used appropriate for MEC being destroyed? | | | X | |
| g. Disposal Procedures IAW project plans | | | X | |
| h. Conducted adequate Demolition Brief | | | X | |
| (1) Misfire procedures properly performed | | | X | |
| 10. Location Survey & Mapping Plan | Yes | No | N/A | Comments |
| a. Registered land surveyor | X | | | |
| b. Surveyors received site-specific training | X | | | |
| c. UXO escort provided | X | | | |



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| | | | | |
|--|------------|-----------|------------|----------------------------|
| d. Grid stake, locations swept with geophysical equipment prior to driving stakes | X | | | |
| e. Survey notes being recorded | X | | | |
| 11. Quality Control Plan IAW WP and SAP/QAPP | Yes | No | N/A | Comments |
| a. QC operational checks being conducted | X | | | |
| b. QC grid sweep pattern adequate | X | | | Conducted during trenching |
| c. Results of QC checks being recorded | X | | | |
| d. Nonconformance reports issued if QC checks show discrepancies, or for QA failures | | | X | No QC failures |
| e. Intrusive results/database/PDAs entries are checked by UXOQC | X | | | |
| 12. Vegetation Removal IAW, WP | Yes | No | N/A | Comments |
| a. Equipment operated to prevent impact with possible surface MEC | X | | | |
| b. Cutting does not present implement hazard | X | | | |
| c. UXO personnel monitoring cutting operation | X | | | |
| d. MEC discovered marked/handled appropriately | | | X | |
| e. Equipment being operated safely & IAW Operators Manual | X | | | |

APPENDIX B

CONSTRUCTION CONTRACT
NON-COMPLIANCE NOTICE

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CONSTRUCTION CONTRACT NON-COMPLIANCE NOTICE
NAVFAC 4330/36 (Rev. 3/03)

| | |
|--|---|
| CONTRACTOR/RESPONSIBLE INDIVIDUAL CE2-Kleinfelder Joint Venture | NOTICE NUMBER 2229-CTO002-001 |
| CONTRACT NUMBER AND TITLE Final Remedial Investigation and Radiological Scoping Survey Work Plan (March 2014) | DATE 6/9/14 |
| SPECIFICATION PARAGRAPH AND/OR DRAWING NUMBER Final Remedial Investigation and Radiological Scoping Survey Work Plan (March 2014) Appendix C, MEC SAP, Section 17.5 | CONTRACTOR REPLY BY DATE |
| REFERENCE (Shop Drawing, Certification, CQC Report Number, etc.) Final Remedial Investigation and Radiological Scoping Survey Work Plan (March 2014) Appendix C, MEC SAP, Section 17.5 | |

DEFICIENCY IN WORKMANSHIP AND/OR MATERIAL
Eight (8) blind QC seeds were buried in the proposed DGM area by the UXO QCS. Three of the seeds were not selected for excavation. Refer to summary below.

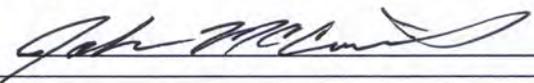
| QC SEE D ID | SIZE | NORTHING | EASTING | DEPTH | DIRECTION | Target ID | Date Dug | Comment |
|-------------|---------|-------------|-------------|-------|-------------|-----------|----------|--|
| QC-1 | 1/2"x3" | 1800137.009 | 6479386.574 | 5" | North-South | 37 | 6/3/14 | Found |
| QC-2 | 1/2"x3" | 1800487.098 | 6479626.523 | 5" | East-West | 347 | | Anomaly #347, not picked to dig, was masked by high mV response (3038 mV on the stack) of the nearby linear feature. |
| QC-3 | 1/2"x3" | 1800329.358 | 6479843.127 | 5" | North-South | 673 | | Picked to dig, 78.8 mV on stack |
| QC-4 | 1/2"x3" | 1800179.572 | 6479843.694 | 5" | East-West | 675 | | Anomaly #675, not picked to dig, was masked by high mV response (3108 mV on the stack) of an unknown source. |
| QC-5 | 1/2"x3" | 1800331.906 | 6479865.832 | 5" | East-West | 765 | | Picked to dig, 459 mV on stack. |
| QC-6 | 1/2"x3" | 1800253.731 | 6479908.421 | 5" | East-West | 898 | | Anomaly #901, not picked to dig, was masked by high mV response (7445 mV on the stack) of the nearby linear feature. |
| QC-7 | 1/2"x3" | 1800209.731 | 6479884.466 | 5" | North-South | 830 | | Picked to dig, 135 mV on stack |
| QC-8 | 1/2"x3" | 1800197.079 | 6479872.749 | 5" | North-South | 791/ 792 | | Picked to dig, 196 mV on stack |

CORRECTIVE ACTION ACCOMPLISHED (This block filled in by Contractor)
This is a common problem in geophysics, where the presence of large items masks the presence of smaller items. For cleanup projects, large mV response areas would require further investigation, and a potential smaller MEC item (that had been masked) would have been found by a larger scale removal action (excavation). This is a remedial investigation project. For the purposes of this remedial investigation, the reason that these three seeds were not selected to dig is discussed above and requires no additional corrective action regarding anomaly picking.

The unknown linear large mV features were not visible on the surface and were not detected by the handheld magnetometer used to clear the area for seed placement. UXO technicians will remove the three "not picked" blind QC seeds.

QA REPRESENTATIVE

NAME: John McCormick TITLE: ECM QA

DATE: 06/11/14 SIGNATURE: 

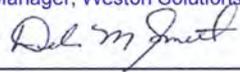
CM

NAME: Izzat Amadea TITLE: ROICC SF Bay Construction Manager

DATE: 6/11/14 SIGNATURE: _____

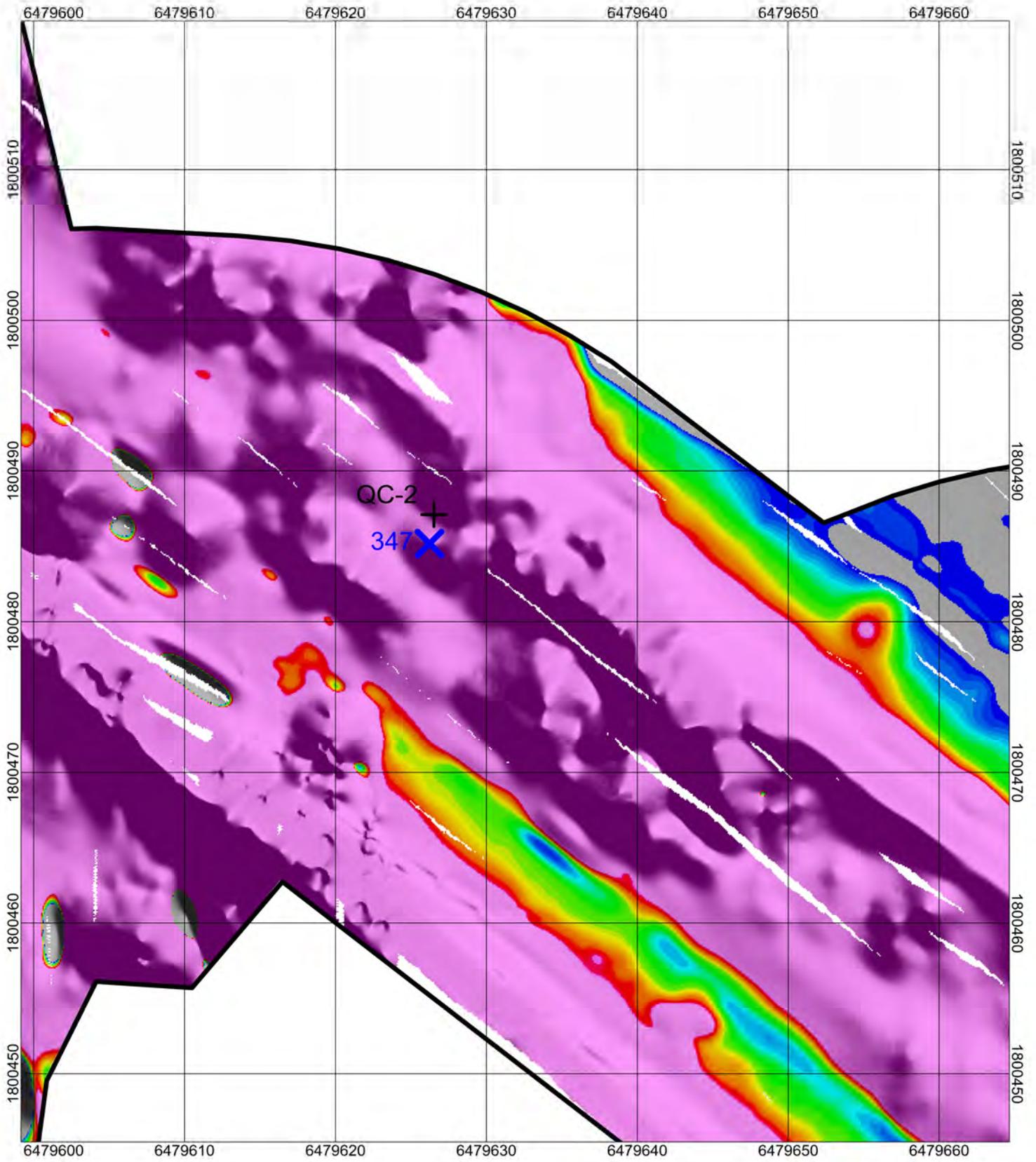
CONTRACTOR'S ACKNOWLEDGMENT

NAME: Delia Smith TITLE: Project QC Manager, Weston Solutions, Inc.

DATE: 6/10/14 SIGNATURE: 

This Notice does NOT authorize any work not included in the Contract and shall not constitute a basis for additional payment or time. If you are in disagreement with this Notice, notify the Contracting Officer immediately in writing.

DISTRIBUTION
Original - QC Manager or Superintendent (Original)
Copies to - Contractor's Home Office, QA Representative, Contract File



Seed ID +

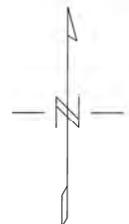
Nearest Target X

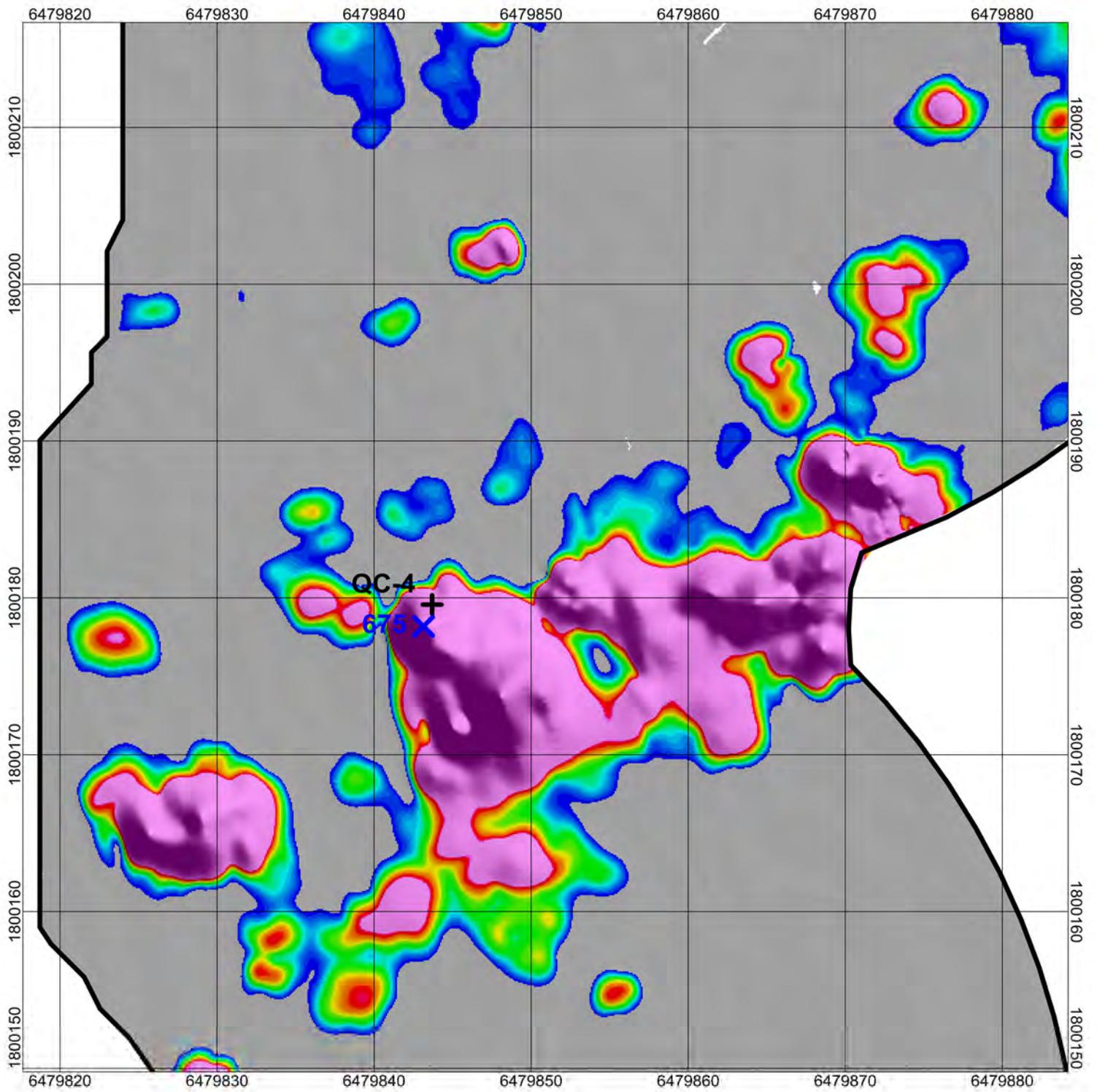
Seed: QC-2



US survey foot

NAD83 / California zone 2 (ftUS)

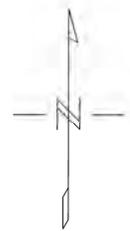


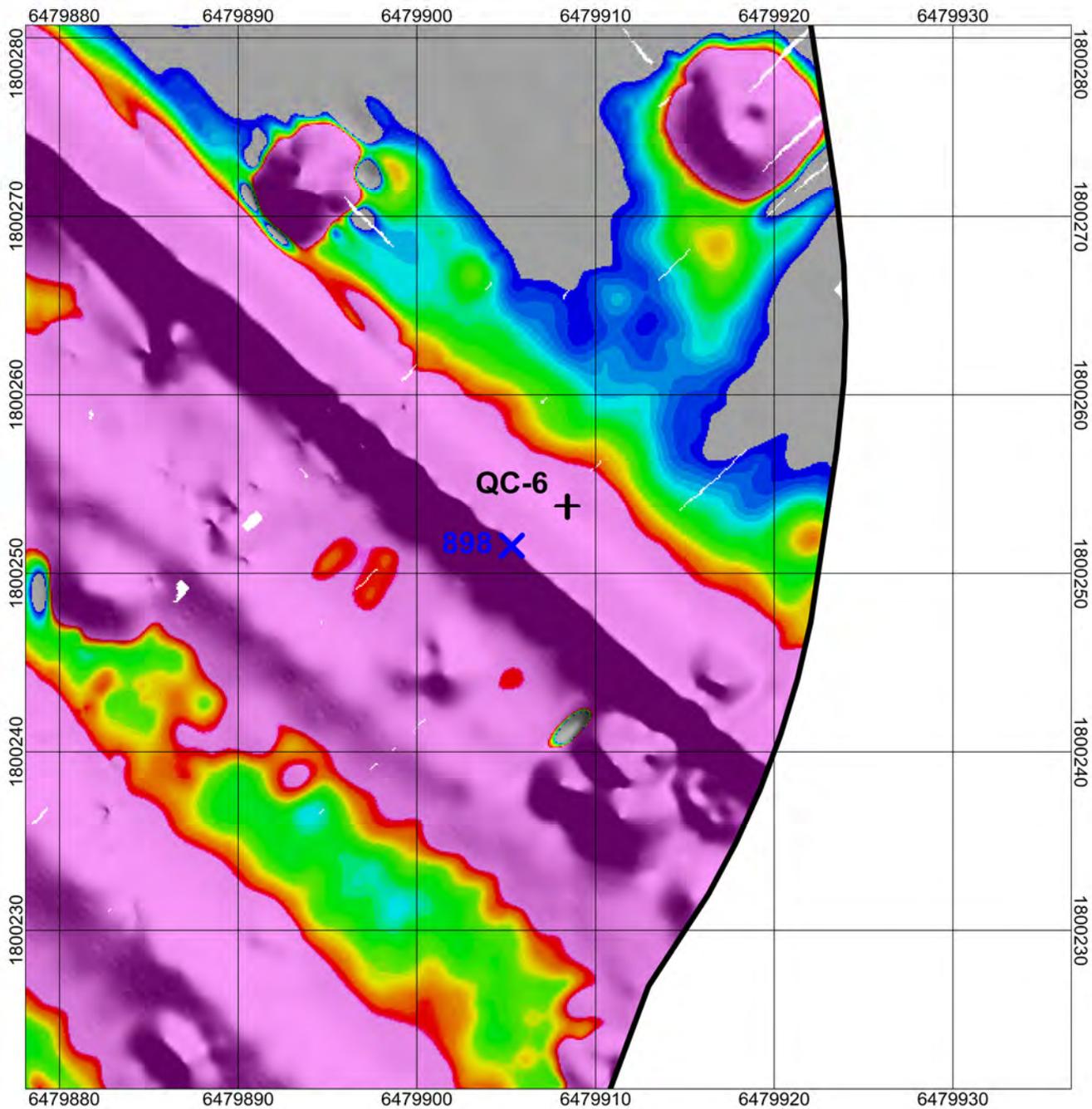


Seed ID +
Nearest Target X



Seed: QC-4





Seed ID +

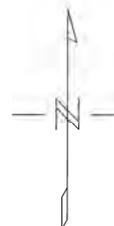
Nearest Target X



US survey foot

NAD83 / California zone 2 (ftUS)

Seed: QC-6



APPENDIX C
GEOPHYSICAL THIRD PARTY QA SUMMARY

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1605 School Street, #4
Moraga CA 94556
925 (808-8965)

August 14, 2014

Mr. Don Stevens, P.E.
Environmental Cost Management
5632 Shadle Way
Fair Oaks, California 95628

Subject: Summary Report
Quality Assessment (QA) of Digital Geophysical Mapping (DGM) Data
Paint Waste Area (PWA), Former Mare Island Naval Shipyard (MINS)
Vallejo, California

Dear Mr. Stevens:

1.0 INTRODUCTION

Under contract to Environmental Cost Management (ECM), Advanced Geological Services, Inc. (AGS) has reviewed the digital geophysical mapping (DGM) data obtained at the Parcel XVI Paint Waste Area (PWA) within the former Mare Island Naval Shipyard (MINS) as part of the overall QA effort to assess the RI contractor's MEC investigation/removal efforts. AGS' work was confined to reviewing data provided to us by others; accordingly, we did not observe the data acquisition survey work in the field. AGS understands that the data were generated by a Geonics Limited EM61-MK2 geophysical survey instrument, which was wheeled by hand back-and-forth across the site to look for buried metal objects representing potential MEC (munitions and explosives of concern) and/or MPPEH (material potentially presenting an explosive hazard) items. AGS understands that the field work was performed on May 22, 23, 30 and June 3, 2014. The PWA data were emailed to AGS on May 30 and June 4, 2014 by Weston Solutions, Inc (Weston) and were reviewed in AGS' Moraga, California office. On the basis of the provided data, it appears that the PWA DGM survey was performed in two separate areas— a large elongated 0.82-acre area, and a smaller outlying 0.21-acre rectangular area approximately 400 feet to the west.

The PWA data were provided both DatNav (.P61) format and as ASCII .xyz files. AGS reviewed the ASCII .xyz files, which contained the following data columns: *Longitude*, *Latitude*, *Ch1[mV]*, *Ch2[mV]*, *Ch3[mV]*, *Ch4[mV]*, *Elev.[m]*, *Quality*, *Sat.*, *HDOP*, *Time*. The data sets included files for both the field survey data obtained at the PWA site and the associated instrument verification strip (IVS) data from the IVS site approximately 1,000 feet southwest of the PWA site. In addition to the DGM data, Weston provided Excel spreadsheets listing the geographic coordinates of each target pick (representing potential MEC/MPPEH items) and the associated "Target ID" designation number.

2.0 QA REVIEW PROCEDURES

AGS examined the PWA data using the Geosoft OASIS montaj software system. Geosoft is a useful tool for data review because it employs multiple windows and dynamic linking, which allows the reviewer to see a given anomaly target on a contour map, simultaneously view the anomaly as a data profile, and also inspect the database directly to see the numerical values of the associated data. In addition, one can "walk" through a data set by viewing the data profiles on a line-by-line basis. Although the Scope of Work for this QA review calls for a review of 10% of the data, it is worth noting that by generating its own contour maps, AGS was able to

broadly assess 100% of the provided; in addition, at least 10% of the data were also inspected in detail by viewing data profiles to better focus on anomalous responses indicative of potential MEC/MPPEH items.

To perform the review, AGS first imported the data into a GEOSOFT data base and performed a coordinate transformation to convert the Latitude/Longitude coordinates in the original data files to California State Plane Coordinates (NAD83 U.S. Survey Feet). This procedure facilitated plotting of the data point locations to a map, preparing color-filled contour maps, and viewing of the data in map and profile format. AGS then plotted all of the data point locations onto a map to check data density and look for any gaps in the data coverage. The data points were plotted in such a manner that the map symbols used to represent the data points were the same size as an EM61-MK2 sensor coil. With this procedure, any gaps in the data coverage would be readily apparent as a “white space” on the data coverage map.

AGS then used a kriging algorithm to generate color-filled contour maps of the *Ch2* data to look for areas of anomalous response indicative of potential MEC/MPPEH items. AGS also viewed the DGM data in profile format, which provides a better view than a contour map of the amplitude and symmetry of anomalous responses indicative of potential MEC/MPPEH items. Next, AGS plotted Weston’s target picks onto its *Ch2* color-filled contour maps to evaluate Weston’s picking process and look for any potential omissions. As an independent check, AGS scanned multiple data profiles and picked its own set of targets and compared them to the Weston’s target picks. This comparison was facilitated by Geosoft’s dynamic linking utility, which placed a cursor on the target location map at each AGS target pick location. Finally, AGS reviewed the IVS data, which were examined in profile format to assess the degree of correlation between anomalous responses and the seeded item locations.

3.0 RESULTS

3.1 Data Coverage

In general, the EM61-MK2 survey lines were spaced approximately 1.0 to 2.5 feet apart, with data points located approximately every 0.3 feet along each line. A few small “sliver” gaps in data coverage are evident; however, according to email communications with Weston, these data gaps are due to steep slopes that could not be safely traversed with the equipment. One 3- by 3-foot area and five 2-foot wide gaps measuring approximately 10 to 20 feet long are present in the larger 0.82-acre survey area, and two 2- by 4-foot gaps are present in the smaller 0.21-acre survey area. Overall, including the gaps caused by the steep slopes, the DGM survey covered approximately 99.8% of the PWA site.

3.2 Data Quality

Data quality is very good, as evidenced by the near spot-on repeatability IVS data, the good correlation between the spike responses and seeded item locations along the IVS test lines, the smooth, symmetrical anomaly response curves in the field data, and the overall flat, clean, nature of the background data. Although the data are of good quality, it is worth noting that the PWA site contained numerous noise sources (e.g., fences and other metal items not associated with MEC/MPPEH items) that produced high-amplitude responses throughout the site.

3.3 Target Picking

As stated previously, AGS picked numerous anomaly targets and compared the locations to Weston’s target picks. In most cases, AGS’s independent target picks corresponded to a Weston target pick; however, due to abundance of noise sources (i.e., non MEC/MPPEH items) present, AGS occasionally picked an anomaly peak, or spike, that did not correspond to a Weston target pick. In general, the noise sources produced broad, high-amplitude responses indicative of large metallic objects on the ground surface, as compared to the narrower, lower-amplitude response indicative of smaller buried objects. AGS understands through email communications with Weston that judgment and field checking were used to assess the validity of some of the target picks and help discount those that did not represent potential MEC/MPPEH items.

4.0 CONCLUSION

The PWA DGM data are of good quality and provided better than 99.8% coverage of the site. The target picking interpretation process was thorough and accurately performed, to the extent possible given the noisy site conditions. Accordingly, it is AGS' opinion that the MEC contractor achieved the project goal of obtaining and interpreting data to provide the Navy RPM with a high degree of confidence that the PWA site was adequately characterized with respect to potential MEC/MPPEH items within the detection limits of the EM61-MK2 instrument.

Respectfully,



Roark W. Smith
Senior Geophysicist, GP 987
Advanced Geological Services
rsmith@advancedgeo.com
(925) 808-8965

APPENDIX D
FIELD QA DAILY REPORTS

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Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

Munitions & Explosives of Concern (MEC) QA Daily Report

Date: 05-19-14

Report #: 001

Weather Conditions: Windy

Temperature: Low: 55 High: 72

Wind: MPH 23

Precipitation: 0.00

Site Conditions: Dry

- **Work Performed:** (Indicate location and description of activity).
- *Attended and observed the site safety brief and the daily operational brief.*
- *Inspected Site Personnel records of certifications. The records are current and in compliance for the personnel that were on site today.*
- *Reviewed Work Plan and ESS.*
- *Observed Weston personnel properly install the IVS in accordance with the Work Plan.*

1. Ordnance or Ordnance Related Material Encountered; Condition and Location:

- N/A

2. Disposition of Ordnance Items Encountered, Include Dates: (i.e. turned over to Military EOD, Disposal by detonation, Storage awaiting disposition):

- N/A

3. Verbal Instructions Received or Given: (List any instructions received from client or given by ECM on Quality Assurance issues identified and the corresponding action to be taken):

- N/A

4. Changed Conditions/Delays/Conflicts Encountered: (List any conflicts, which have hindered the Quality Assurance process):

- N/A.

5. Other comments or additional information:

- *See attachments illustrating the description and location of the IVS.*

Contractor's Verification: The above report is complete and correct. All material and equipment used and work performed during this reporting period are in compliance with the plans and specifications except as noted above.

Date: 05-19-14

A handwritten signature in cursive script, appearing to read "John McCormick".

(signature)

Name of QA: John McCormick

Unexploded Ordnance Quality Assurance (UXOQA)



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

PICTURES



Photo 1: [IVS Site]
Photo Date: 05-19-14



Photo 2: [No intrusive work was performed until
the Biologist performed a final inspection of the IVS]
Photo Date: 05-19-14



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick



Photo: 3 [IVS being installed]
Photo Date: 05-19-14



Photo: 4 [Photo of one of the two 1/2"X3" IVS seeds]
Photo Date: 05-19-14



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick



Photo: 5 [Photo of one of the two 2"X8" IVS Seeds]
Photo Date: 05-19-14



Photo: 6 [Photo of one of the two 3"X12" IVS Seeds.
This one is being placed at a depth of 30"]
Photo Date: 05-19-14



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

Munitions & Explosives of Concern (MEC) QA Daily Report

Date: 05-20-14

Report #: 002

Weather Conditions: Windy

Temperature: Low: 55 High: 70

Wind: MPH 22

Precipitation: 0.00

Site Conditions: Dry

- **Work Performed:** (Indicate location and description of activity).
- *Attended and observed the site safety brief and the daily operational brief.*
- *Installed Blind Seeds in the areas that DGM data will be gathered from.*

1. Ordnance or Ordnance Related Material Encountered; Condition and Location:

- N/A

2. Disposition of Ordnance Items Encountered, Include Dates: (i.e. turned over to Military EOD, Disposal by detonation, Storage awaiting disposition):

- N/A

3. Verbal Instructions received or Given: (List any instructions received from client or given by ECM on Quality Assurance issues identified and the corresponding action to be taken):

- N/A

4. Changed Conditions/Delays/Conflicts Encountered: (List any conflicts, which have hindered the Quality Assurance process):

- N/A.

5. Other comments or additional information:

- *See photos illustrating the location and orientation of the blind seeds. All seed locations are measured in US Survey Feet.*

Contractor's Verification: The above report is complete and correct. All material and equipment used and work performed during this reporting period are in compliance with the plans and specifications except as noted above.

Date: 05-20-14

A handwritten signature in cursive script, appearing to read "John McCormick".

(Signature)

Name of QA: John McCormick

Unexploded Ordnance Quality Assurance (UXOQA)



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

PICTURES



Photo 1: [Blind Seed #QA001]



Photo 2: [Blind Seed #QA002]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick



Photo 3: [Blind Seed #QA003]



Photo 4: [Blind Seed #QA004]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

BLIND SEED TRACKING LOG

Site Name: Mare Island "PWA"

UXOQA: John McCormick

| Date Placed | Seed Serial No. | Item Description | Latitude | Longitude | Depth | Horiz/Vertical | 45 Degrees | Bearing | Date Recovered | Notes |
|-------------|-----------------|-----------------------|--------------|--------------|-------|----------------|------------|-------------|----------------|-------|
| 05/20/2014 | QA001 | 1/2"x3" Steel pipe | N1800444.538 | E6479734.112 | 6" | Horiz | NO | North/South | N/A | |
| 05/20/2014 | QA002 | 1/2"x3" Steel Pipe | N1800194.947 | E64798650375 | 6" | Horiz | NO | North/East | N/A | |
| 05/20/2014 | QA003 | 1/2"x3" Steel Pipe | N1800485.298 | N6479668.234 | 4" | Horiz | Yes | South/West | N/A | |
| 05/20/2014 | QA004 | 1/2"x3" Steel Pipe | N1800164.015 | E6479350.347 | 4" | Horiz | Yes | South/East | N/A | |



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

Munitions & Explosives of Concern (MEC) QA Daily Report

Date: 05-22-14

Report #: 003

Weather Conditions: Windy

Temperature: Low: 57 High: 73

Wind: MPH 15

Precipitation: 0.00

Site Conditions: Dry

- **Work Performed:** (Indicate location and description of activity).
 - *Attended and observed the site safety brief and the daily operational brief.*
 - Observed the EM-61MK2A operational checks and prove out. A Spike, static and cable shift test was conducted. The geophysical prove out resulted in a <1 MV amount of background noise. Results: PASSED
 - Observed the Geophysical Team gathering data in the operational area. The approach being utilized is resulting in excellent area coverage.
1. **Ordnance or Ordnance Related Material Encountered; Condition and Location:**
 - N/A
 2. **Disposition of Ordnance Items Encountered, Include Dates:** (i.e. turned over to Military EOD, Disposal by detonation, Storage awaiting disposition):
 - N/A
 3. **Verbal Instructions received or given:** (List any instructions received from client or given by ECM on Quality Assurance issues identified and the corresponding action to be taken):
 - N/A
 4. **Changed Conditions/Delays/Conflicts Encountered:** (List any conflicts, which have hindered the Quality Assurance process):
 - N/A.
 5. **Other comments or additional information:**
 - *Once the EM61 MK2 was set up and operational; the Geophysical Team performed the equipment operational checks and conducted a complete by the numbers Geophysical Prove out. Both members of the Geophysical Team demonstrated a high level of technical expertise and professionalism that is noteworthy.*



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

Contractor's Verification: The above report is complete and correct. All material and equipment used and work performed during this reporting period are in compliance with the plans and specifications except as noted above.

Date: 05-22-14

(Signature)

Name of QA: John McCormick

Unexploded Ordnance Quality Assurance (UXOQA)



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

PICTURES



Photo 1: [Geophysical Team conducting operational checks of the EM61MK2A]



Photo 2: [Geophysical Team Conducting the Prove Out]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick



Photo 3: [Geophysical Team gathering data in the operational area]



Photo 4: [Marking guide lines for the EM61 operator]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

Munitions & Explosives of Concern (MEC) QA Daily Report

Date: 05-27-14

Report #: 004

Weather Conditions: Windy

Temperature: Low: 54 High: 73

Wind: MPH 19

Precipitation: 0.00

Site Conditions: Dry

- **Work Performed:** (Indicate location and description of activity).
 - *Attended and observed the site safety brief and the daily operational brief.*
1. **Ordnance or Ordnance Related Material Encountered; Condition and Location:**
 - N/A
 2. **Disposition of Ordnance Items Encountered, Include Dates:** (i.e. turned over to Military EOD, Disposal by detonation, Storage awaiting disposition):
 - N/A
 3. **Verbal Instructions received or given:** (List any instructions received from client or given by ECM on Quality Assurance issues identified and the corresponding action to be taken):
 - N/A
 4. **Changed Conditions/Delays/Conflicts Encountered:** (List any conflicts, which have hindered the Quality Assurance process):
 - *There is a substantial amount of pickle weed cutting left to do before completing the DGM.*
 - *The EM61 MK2 is broken and Weston is awaiting parts.*
 5. **Other comments or additional information:**
 - *UXOQA received and reviewed the DGM data from Weston that is available so far.*

Contractor's Verification: The above report is complete and correct. All material and equipment used and work performed during this reporting period are in compliance with the plans and specifications except as noted above.

Date: 05-27-14

A handwritten signature in cursive script, appearing to read 'John McCormick'.

(Signature)

Name of QA: John McCormick

Unexploded Ordnance Quality Assurance (UXOQA)



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

PICTURES



Photo 1: [Pickle weed cutting]



Photo 2: [Photo taken from the north looking south showing the amount of pickle weed left to be cut in order to perform DGM activities. The pickle weed to be cut is shown in the left 1/3rd of the photo]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick



Photo 3: [Photo illustrating that there is still a considerable amount of silt fence to be installed]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

Munitions & Explosives of Concern (MEC) QA Daily Report

Date: 06-03-14

Report #: 005

Weather Conditions: Windy

Temperature: Low: 54 High: 72

Wind: MPH 8

Precipitation: 0.00

Site Conditions: Dry

- **Work Performed:** (Indicate location and description of activity).
- *Attended and observed the site safety brief and the daily operational brief.*
- *Observed DGM activities that were conducted in the last of the data gaps.*
- *Observed the GPO of the EM61 MK2. The results were consistent with the original prove out.*
- *Observed radiological surveys that were conducted in the reacquired target area.*
- *Observed intrusive operations.*
- *Performed QA inspection on 7 of the 67 reacquired targets. RESULTS: Passed. (See Photos)*

1. Ordnance or Ordnance Related Material Encountered; Condition and Location:

- N/A

2. Disposition of Ordnance Items Encountered, Include Dates: (i.e. turned over to Military EOD, Disposal by detonation, Storage awaiting disposition):

- N/A

3. Verbal Instructions received or given: (List any instructions received from client or given by ECM on Quality Assurance issues identified and the corresponding action to be taken):

- N/A

4. Changed Conditions/Delays/Conflicts Encountered: (List any conflicts, which have hindered the Quality Assurance process):

- N/A

5. Other comments or additional information:

- *Some of the reacquired targets are in very close proximity to each other (i.e.; targets 25, 27, 29 & 34). When targets are close together it can cause two targets to share a contact especially when the contact is a larger object at the two foot boundary of each flag.*
- *The items excavated today were Cultural Debris.*



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

Contractor's Verification: The above report is complete and correct. All material and equipment used and work performed during this reporting period are in compliance with the plans and specifications except as noted above.

Date: 06-03-14

(Signature)

Name of QA: John McCormick

Unexploded Ordnance Quality Assurance (UXOQA)



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

PICTURES



Photo 1: [DGM being conducted in the last data gap]



Photo 2: [GPO being conducted]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

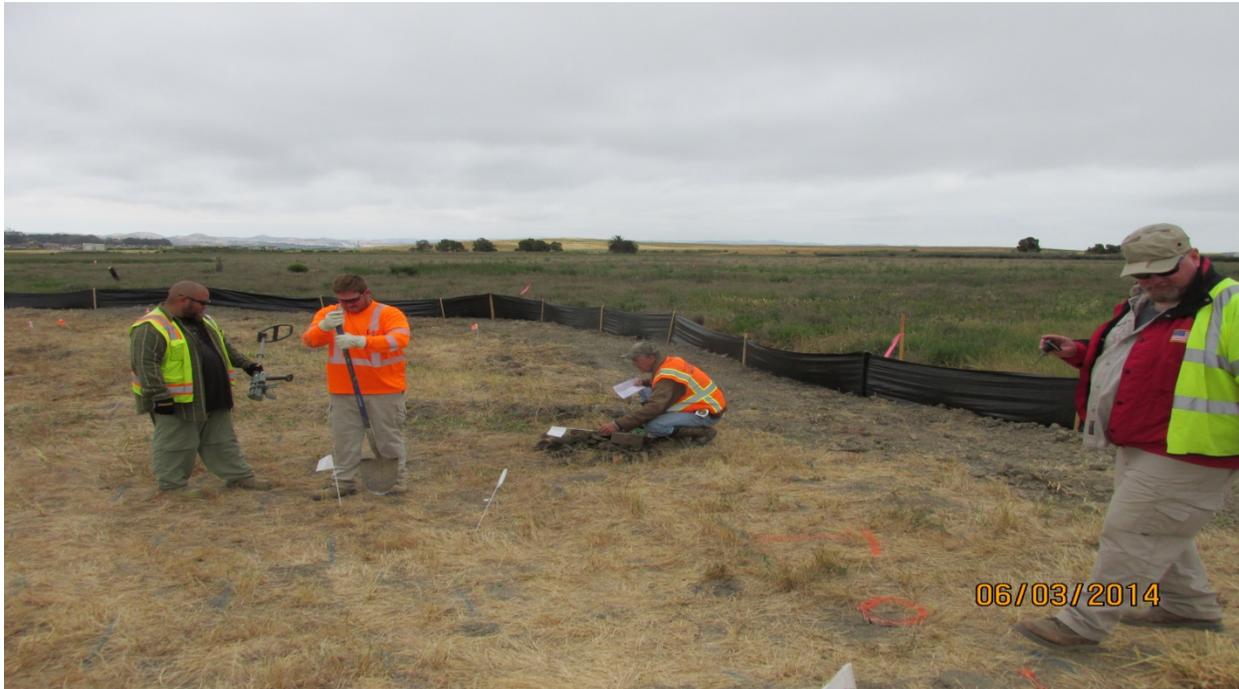


Photo 3: [Radiological targets being dug prior to intrusive activities on reacquired targets being conducted.]



Photo 4: [Multiple pieces of scrap metal found in Target #6 at 12"]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick



Photo 5: [Water table encountered at 40"-48" depth]



Photo 6: [UXO Technician locating contacts at targets 29 and 34]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick



Photo 6: [4' wide excavation at targets 25,27,29 and 34]



Photo 7: [Once the excavation was cleared of anomalies it was back filled. The flags were replaced in their original location to illustrate their proximity]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

Munitions & Explosives of Concern (MEC) QA Daily Report

Date: 06-04-14

Report #: 006

Weather Conditions: Windy

Temperature: Low: 55 High: 81

Wind: MPH 12

Precipitation: 0.00

Site Conditions: Dry

- **Work Performed:** (Indicate location and description of activity).
- *Attended and observed the site safety brief and the daily operational brief.*
- *Observed intrusive operations.*
- *Performed QA inspection on additional targets. RESULTS: Passed.*

1. Ordnance or Ordnance Related Material Encountered; Condition and Location:

- N/A

2. Disposition of Ordnance Items Encountered, Include Dates: (i.e. turned over to Military EOD, Disposal by detonation, Storage awaiting disposition):

- N/A

3. Verbal Instructions received or given: (List any instructions received from client or given by ECM on Quality Assurance issues identified and the corresponding action to be taken):

- N/A

4. Changed Conditions/Delays/Conflicts Encountered: (List any conflicts, which have hindered the Quality Assurance process):

- N/A

5. Other comments or additional information:

- *Addendum to QA Report # 004: A Weston QC seed # QC-1 was located on target #37.*
- *Investigation of target #54 resulted in the location of a considerable amount of debris of a 5 Gallon paint can with what appears to be red lead based paint. The SUXOS notified Weston personnel and the decision was made to leave the excavation open and place the excavated soils in plastic. (See Photo 1)*

Contractor's Verification: The above report is complete and correct. All material and equipment used and work performed during this reporting period are in compliance with the plans and specifications except as noted above.

Date: 06-04-14

A handwritten signature in cursive script, appearing to read "John McCormick".

(Signature)

Name of QA: John McCormick

Unexploded Ordnance Quality Assurance (UXOQA)



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

PICTURES



Photo 1: [Remnants of a 5 GL paint can, containing suspect lead based paint. Found in target #54]



Photo 2: [UXO Technician using the EM61 in order to verify that a target is clear]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick



Photo 3: [Multiple Cultural Debris items found during intrusive operations]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

Munitions & Explosives of Concern (MEC) QA Daily Report

Date: 06-10-14

Report #: 007

Weather Conditions: Windy

Temperature: Low: 55 High: 75

Wind: MPH 11

Precipitation: 0.00

Site Conditions: Dry

- **Work Performed:** (Indicate location and description of activity).
- *Attended and observed the site safety brief and the daily operational brief.*
- *Observed intrusive operations.*
- *Performed QA inspection of QA pre-selected targets in SU-11. RESULTS: Passed.*

1. Ordnance or Ordnance Related Material Encountered; Condition and Location:

- *N/A*

2. Disposition of Ordnance Items Encountered, Include Dates: (i.e. turned over to Military EOD, Disposal by detonation, Storage awaiting disposition):

- *N/A*

3. Verbal Instructions received or given: (List any instructions received from client or given by ECM on Quality Assurance issues identified and the corresponding action to be taken):

- *N/A*

4. Changed Conditions/Delays/Conflicts Encountered: (List any conflicts, which have hindered the Quality Assurance process):

- *N/A*

5. Other comments or additional information:

- *UXO Technicians completed target reacquisition in SU-12 and then moved to SU-11 to conduct intrusive operations. The UXOQA performed QA checks of targets 160, 174, 199 and 247 and all Passed QA. See photos 1-4 for the anomalies that were excavated from these targets.*
- *The UXOQA continued to monitor the intrusive activities of other targets in order to observe that the work plan protocol was adhered to.*

Contractor's Verification: The above report is complete and correct. All material and equipment used and work performed during this reporting period are in compliance with the plans and specifications except as noted above.



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

Date: 06-10-14

(Signature)

Name of QA: John McCormick

Unexploded Ordnance Quality Assurance (UXOQA)



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

PICTURES



Photo 1: [SU-11 QA Target Pick #247 "Scrap Metal" @<6" Depth]



Photo 2: [SU-11 QA Target Pick #199 "Nail" @<6" Depth]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick



Photo 3: [SU-11 QA Target Pick #160 "Scrap Metal Bar" @<6" Depth]



Photo 4: [SU-11 QA Target Pick #174 "Two Scrap Metal Pc's" @<6" Depth"]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick



Photo 5: [UXO Technician chasing multiple small contacts in a 4'WX4'LX4'D hole]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

Munitions & Explosives of Concern (MEC) QA Daily Report

Date: 06-11-14

Report #: 008

Weather Conditions: Windy

Temperature: Low: 54 High: 75

Wind: MPH 18

Precipitation: 0.00

Site Conditions: Dry

- **Work Performed:** (Indicate location and description of activity).
- *Attended and observed the site safety brief and the daily operational brief.*
- *Observed intrusive operations.*
- *Performed QA inspection of QA pre-selected targets in SU-12. RESULTS: Passed.*

1. Ordnance or Ordnance Related Material Encountered; Condition and Location:

- N/A

2. Disposition of Ordnance Items Encountered, Include Dates: (i.e. turned over to Military EOD, Disposal by detonation, Storage awaiting disposition):

- N/A

3. Verbal Instructions received or given: (List any instructions received from client or given by ECM on Quality Assurance issues identified and the corresponding action to be taken):

- N/A

4. Changed Conditions/Delays/Conflicts Encountered: (List any conflicts, which have hindered the Quality Assurance process):

- N/A

5. Other comments or additional information:

- *UXO Technicians conducted intrusive operations in SU-12. The UXOQA performed QA checks of targets 258, 268, 292, 393, 418, 442, 457, 596, 560, 578, 624, 744 and 783. The results of these checks resulted in no detectable anomaly's (Passed QA).*
- *All items excavated were Cultural Debris "CD" with the exception of Target #393 (QA Seed #003) was located.*
- *The UXOQA continued to monitor the intrusive activities of other targets in order to observe that the work plan protocol was adhered to.*



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

Contractor's Verification: The above report is complete and correct. All material and equipment used and work performed during this reporting period are in compliance with the plans and specifications except as noted above.

Date: 06-11-14

(Signature)

Name of QA: John McCormick

Unexploded Ordnance Quality Assurance (UXOQA)



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

PICTURES



Photo 1: [SU-12 Reacquired Targets]



Photo 2: [Radiation checks being performed at 1' depth increments]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick



Photo 3: [Excavated Cultural Debris found at various depths on multiple targets]



Photo 4: [Spoils from Target #320 that was full of bricks]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick



Photo 5: [After a 4' Depth excavation was achieved on Target#320 the bricks continued]



Photo 6: [At a depth of approximately 4' a 3" pipe running North and South was located. It was left in place]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

Munitions & Explosives of Concern (MEC) QA Daily Report

Date: 06-12-14

Report #: 009

Weather Conditions: Windy

Temperature: Low: 54 High: 73

Wind: MPH 18

Precipitation: 0.00

Site Conditions: Dry

- **Work Performed:** (Indicate location and description of activity).
- *Attended and observed the site safety brief and the daily operational brief.*
- *Observed intrusive operations.*
- *Performed QA inspection of QA pre-selected targets in SU-12. RESULTS: Passed.*
- *UXOQA Removed QA Seeds that were not picked as targets.*

1. Ordnance or Ordnance Related Material Encountered; Condition and Location:

- N/A

2. Disposition of Ordnance Items Encountered, Include Dates: (i.e. turned over to Military EOD, Disposal by detonation, Storage awaiting disposition):

- N/A

3. Verbal Instructions received or given: (List any instructions received from client or given by ECM on Quality Assurance issues identified and the corresponding action to be taken):

- N/A

4. Changed Conditions/Delays/Conflicts Encountered: (List any conflicts, which have hindered the Quality Assurance process):

- N/A

5. Other comments or additional information:

- *UXO Technicians conducted intrusive operations in SU-12. The UXOQA performed QA checks of targets 614, 634, 649, 653, 669, 689, 698, 758, 798, 813, 835 and 854. The results of these checks resulted in no detectable anomaly's (Passed QA).*
- *Target #758 (QA Seed #002) was located. Target 854 (QC Seed #7) and Target #792 (QC Seed #8) was located. The remaining targets that were excavated resulted in the location and removal of Cultural Debris "CD".*
- *The UXOQA continued to monitor the intrusive activities of other targets in order to observe that the work plan protocol was adhered to.*
- *The UXOQA removed the two QA Seeds that were not picked as targets (QA-01 and QA-04). These seeds were placed in an area where buried metallic anomalies masked the ability to locate the QA seed. All QA Seeds are accounted for.*



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

Contractor's Verification: The above report is complete and correct. All material and equipment used and work performed during this reporting period are in compliance with the plans and specifications except as noted above.

Date: 06-12-14

(Signature)

Name of QA: John McCormick

Unexploded Ordnance Quality Assurance (UXOQA)



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

PICTURES



Photo 1: [UXO Technicians investigating targets in SU-12]



Photo 2: [Cultural Debris "CD" Excavated from various targets in SU-12]



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Photo 3: [Remaining Targets to be investigated in SU-12]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

BLIND SEED TRACKING LOG

Site Name: Mare Island "PWA"
UXOQA: John McCormick

| Date Placed | Seed Serial No. | Item Description | Latitude | Longitude | Depth | Horiz/Vertical | 45 Degrees | Bearing | Date Recovered | Notes |
|-------------|-----------------|-----------------------|--------------|--------------|-------|----------------|------------|-------------|----------------|--|
| 05/20/2014 | QA001 | 1/2"x3" Steel pipe | N1800444.538 | E6479734.112 | 6" | Horiz | NO | North/South | 06/12/14 | Removed by QA, was not selected as a target to be investigated |
| 05/20/2014 | QA002 | 1/2"x3" Steel Pipe | N1800194.947 | E6479865.037 | 6" | Horiz | NO | North/East | 06/12/14 | Recovered within SU-12 TGT#758 |
| 05/20/2014 | QA003 | 1/2"x3" Steel Pipe | N1800485.298 | E6479668.234 | 4" | Horiz | Yes | South/West | 06/11/14 | Recovered within SU-12 TGT#393 |
| 05/20/2014 | QA004 | 1/2"x3" Steel Pipe | N1800164.015 | E6479350.347 | 4" | Horiz | Yes | South/East | 06/12/14 | Removed by QA, was not selected as a target to be investigated |



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

Munitions & Explosives of Concern (MEC) QA Daily Report

Date: 06-30-14

Report #: 010

Weather Conditions: Windy

Temperature: Low: 62 High: 78

Wind: MPH 08

Precipitation: 0.00

Site Conditions: Dry

- **Work Performed:** (Indicate location and description of activity).
- *Performed UXOQA on trenches and the spoils from the trenches.*

1. Ordnance or Ordnance Related Material Encountered; Condition and Location:

- N/A

2. Disposition of Ordnance Items Encountered, Include Dates: (i.e. turned over to Military EOD, Disposal by detonation, Storage awaiting disposition):

- N/A

3. Verbal Instructions received or given: (List any instructions received from client or given by ECM on Quality Assurance issues identified and the corresponding action to be taken):

- N/A

4. Changed Conditions/Delays/Conflicts Encountered: (List any conflicts, which have hindered the Quality Assurance process):

- N/A

5. Other comments or additional information:

- *UXOQA was performed utilizing the Whites XLT all Metals Detector. The trenches and the spoils were remarkably free of anomalies and only rust remnants from removed Cultural Debris "CD" remained.*
- *The UXOQA also inspected the 20 yard container that was left on site and found it to be empty.*
- *This the final UXOQA report for this effort.*

Contractor's Verification: The above report is complete and correct. All material and equipment used and work performed during this reporting period are in compliance with the plans and specifications except as noted above.

Date: 06-30-14

A handwritten signature in cursive script, appearing to read "John McCormick".

(Signature)

Name of QA: John McCormick

Unexploded Ordnance Quality Assurance (UXOQA)



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

PICTURES



Photo 1: [Trench 1]



Photo 2: [Trench 4]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick



Photo 3: [QA using the Whites XLT to check for anomalies]



Photo 4: [20 yard container onsite]



Environmental Cost Management, Inc.

Project: MINS PWA Third-Party Independent QA
Contract: N62473-13-C-2405
Location: Former Mare Island Naval Shipyard, Vallejo, CA
Prepared by: John McCormick

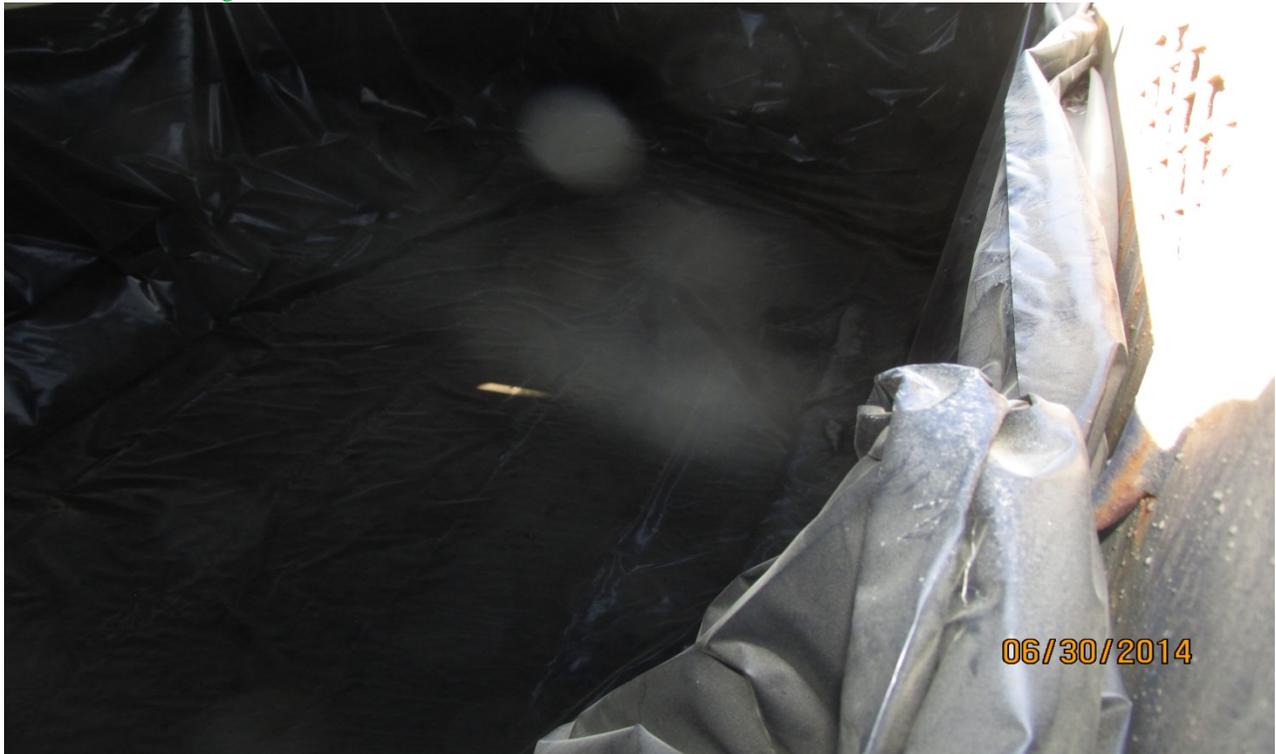


Photo 5: [Photo confirming that container DB 1405 is empty]

APPENDIX E
BLIND SEED TRACKING LOG

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Environmental Cost Management, Inc.

Project: QAIPP for Munitions Response 3rd Party QA
 Contract: N62473-13-C-2405
 Location: Former Mare Island Naval Shipyard, Vallejo, CA
 Prepared by: John McCormick

Blind Seed Tracking Log

| Date Placed | Seed Serial No. | Item Description | Latitude | Longitude | Depth | Horiz/Vertical | 45 Degrees | Bearing | Date Recovered | Notes |
|-------------|-----------------|-----------------------|--------------|--------------|-------|----------------|------------|-------------|----------------|--|
| 05/20/2014 | QA001 | 1/2"x3" Steel pipe | N1800444.538 | E6479734.112 | 6" | Horiz | No | North/South | 06/12/14 | Removed by QA, was not selected as a target to be investigated |
| 05/20/2014 | QA002 | 1/2"x3" Steel Pipe | N1800194.947 | E64798650375 | 6" | Horiz | No | North/East | 06/12/14 | SU-12 TGT#758 |
| 05/20/2014 | QA003 | 1/2"x3" Steel Pipe | N1800485.298 | N6479668.234 | 4" | Horiz | Yes | South/West | 06/11/14 | SU-12 TGT#393 |
| 05/20/2014 | QA004 | 1/2"x3" Steel Pipe | N1800164.015 | E6479350.347 | 4" | Horiz | Yes | South/East | 06/12/14 | Removed by QA, was not selected as a target to be investigated |

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