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CORRECTIVE ACTION REPORT

DATE: 09-10-2008 PROJECT NAME: FORA ESCA RP PROJECT LOCATION: Former Fort Ord, CA

APPLICABLE DOCUMENT / SECTION: Final Addendum to Final OE-15SEA.1-4 Site-Specific Work Plan, Phase II Seaside Munitions Response Area (MRA) Removal Action, Former Fort Ord, dated January 24, 2008 ("the SSWP Addendum")

SUBJECT: Failure discovered during QC-2 in Special Case Area SCA_W085. SCA_W085 is located within the Seaside MRA, outside the future roadway and utility corridors.

SUMMARY AND ANALYSIS:

Summary of the Field Investigations at SCA_W085

On August 26, 2008, two 81 millimeter (mm) training mortars (non-explosive) were recovered during the QC-2 phase of operations at a Special Case Area (SCA) polygon identified as SCA_W085. SCA_W085 is located outside the limits of the future roadway and utility corridor sections of the Seaside MRA. Figure 1 (attached) shows the location of SCA_W085 in Munitions Response Site (MRS) MRS-15SEA.4 of the Seaside Munitions Response Area (MRA).

Figure 2 shows the color data plots of the initial phase and QC-2 phase of the Digital Geophysical Mapping (DGM) surveys and associated selected anomalies (targets) identified by unique ID number (e.g., 001, 002, etc.). The left-side image is the initial phase DGM survey and the right-side image is the QC-2 phase DGM survey. The locations of the two 81mm mortars (M68 Training) encountered during QC-2 are labeled as "81mma" and "81mmb" in both images of Figure 2.

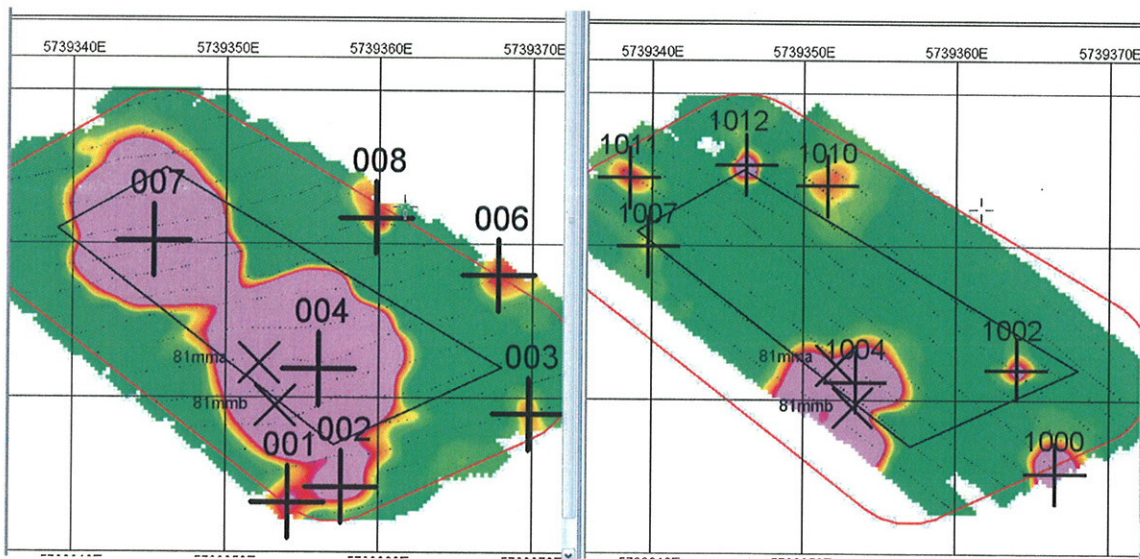


Figure 2
Color Plots of the DGM Surveys
Initial Phase (left) and QC-2 Phase (right)



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The selected anomaly (target) in question is identified on the left-side image of Figure 2 as Anomaly #004. During the initial excavation of this anomaly, 100 pounds (lbs) of metal debris and one 81mm training mortar were encountered at a depth of 12 to 18 inches below ground surface (bgs). Since SCA_W085 was scraped a minimum of 6 inches prior to the geophysical investigation, all depths were reported from below the scraped ground surface. The excavation and the 3-foot radius around the flag for Anomaly #004 were checked with a Schonstedt, Whites All-Metals Detector, and the Geonics EM61-MK2 in manual search mode during the QC-1 post-excitation investigation of the anomaly location. In addition, the EM61-MK2 was used during the QC-2 investigation since it was also used to conduct the initial phase DGM survey of SCA_W085.

SCA_W085 is less than 1,000 square feet and was selected to have a 100% QC-2 resurvey using the EM61-MK2, as approved in Field Variance Form (FVF) No. SEAMRA-006. Seven anomalies were selected for QC-2 investigation. At the QC-2 anomaly (target) identified as Anomaly #1004 on the right-side image of Figure 2, an 81mm M68 training mortar (labeled as 81mma) was discovered at a depth of 36 inches bgs. This target was located 3.8 feet from the flag for the original initial-phase anomaly (Anomaly #004) and 1.67 feet from the flag for the QC-2 anomaly (Anomaly #1004). Subsequent to the QC-2 investigation at Anomaly #1004, a post-excitation check was conducted with the EM61-MK2 and a contact was found to remain. This contact was confirmed with a Schonstedt and the team continued to dig when the second 81mm M68 training mortar (identified as 81mmb on Figure 2) was recovered at a depth of 36 inches bgs, approximately 2 feet from the location of 81mma. The second 81mm M68 training mortar (81mmb) was located outside of the SCA_W085 boundary (defined by the black polygon line in Figure 2), but within a 5-foot expansion zone (defined by the red polygon line in Figure 2) established around each SCA polygon for this removal action. The 81mmb was 3.66 feet from the flag for the original initial-phase anomaly (target; Anomaly #004) and 1.64 feet from the flag for the QC-2 phase anomaly (target; Anomaly #1004).

Root Cause Analysis of the Failure

The original initial phase Anomaly #004 was centered within the footprint of a relatively large anomalous response (greater than 1,000 millivolts [mV] at peak and 124 mV at a distance of 3 feet from the peak). The characteristics of this anomaly suggested that it was from a single subsurface item and therefore only one target was selected as a result of digital data processing. However during excavation, dig teams recovered a concentrated mass of metal at Anomaly #004 weighing 100 lbs. Due to this large concentrated mass of metal, a masking effect was induced and the data processor's ability to select individual items within Anomaly #004 was diminished. As such, the locations of the two missed 81mm practice mortars (81mma and 81mmb) were not readily identifiable in the digital EM61-MK2 data and were not selected as targets for reacquisition.

During QC-2, the 81mm practice mortars (81mma and 81mmb) were recovered just beyond the 3-foot radius used to investigate around flags during post-dig QC-1 procedures. However, considering the location of these two 81mm practice mortars, the EM61-MK2 QC-1 operator should have recognized them as distinct anomalies if implementing the QC-1 standard operating procedures. The peak channel 2 response over the two practice mortars in the QC-2 file was 45 mV. Based on this analysis it has been determined that this was a failure of the EM61-MK2 QC-1 operator to follow QC-1 operating procedures.



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CORRECTIVE ACTIONS:

1. Reinvestigation of previously identified targets were conducted in order to verify that this scenario did not occur during other DGM activities in the Seaside MRA SCAs. Anomalies that had a peak response greater than 500 mV using the 4 channel stack were selected for reinvestigation using a 6-foot search radius around the flagged location. The standard operating procedure for DGM anomaly investigation is to investigate all anomalies within a 3 foot radius of the target. The modified search radius is the action taken for this CAR to identify other potential failures that may have occurred as a result of masking.

Results of Reinvestigation:

- 291 geophysical targets in the roadway and 157 outside the roadway were selected and flagged for re-investigation based on the 500 mV criteria discussed above. The results of the 291 targets investigated in the roadway were reported in the Corrective Action Report-SEAMRA-001, dated September 22, 2008. The Schonstedt and EM61-MK2 were used to search for anomalies at a 6 foot search radius from the flagged location. If any discernable anomaly of any response was indicated on either instrument, the location was excavated. No metal that could be removed from the ground (i.e., not part of fence or site infrastructure) that was greater in mass than 0.1 lb was recovered.
 - Additional QC-2 data was collected in eighteen (18) polygons located within SCAs_W005, W037, W055, W118, W134 and W160. The polygons were placed in areas that had a high density of metal removed during the initial DGM survey and were not covered by the random QC-2 polygons. No failures were identified in any of these additional QC-2 polygons. The largest item encountered was a small tent stake.
 - These results indicate that the high anomaly response masking condition discovered at Anomaly #004 in SCA_W085 was an isolated incident. The 100 lbs of metal recovered from the Anomaly #004 was the largest mass of metal recovered during the project to date. The results also indicate that the EM61-MK2 QC-1 operators performed their duties successfully during DGM activities conducted at the Seaside MRA.
2. The QC-1 EM61-MK2 operators will be trained to recognize deeper objects using the manual search mode of the EM61-MK2 and will be required to review the operating procedures for QC-1.
 3. Following the excavation of a large high-density anomaly, QC-1 procedures will be implemented over the entire excavation footprint in addition to 3-ft beyond the farthest item recovered. This will insure the masking effect influence area from masses of metal that may extend beyond the typical 3 foot search radius used during QC-1 are checked for remaining items.
 4. Color maps of the digital geophysics will be provided to the dig teams so that they can recognize



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areas that may require extra search distances. The dig team will be trained to use the color maps so that small relief anomalies are not automatically assumed to be small insignificant targets.

5. QC-2 is designed to provide a random, yet representative check of the selected re-mapping area. However, based on review of the DGM data and excavation results, the QC Geophysicist may select a portion of QC-2 area from areas that contained large high-density anomalies or anomalous areas during the initial DGM investigation.

A handwritten signature in blue ink, appearing to read "Matt Gifford", is written over a set of horizontal lines.

REPORTED BY: Matt Gifford, QC Geophysicist, ESCA RP Team
