

**Responses to
EPA 12/04/00 Comments
on
Draft –Final Ordnance and Explosives
Final Removal Action Report (11/06/00)**



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4**

**61 Forsyth Street
Atlanta, Georgia 30303-3104**

12/04/00

Mr. Ron Levy
U.S. Army Garrison
BRAC Environmental Coordinator
Environmental Office
Building 215
15th Avenue
Fort McClellan, Alabama 36205-5000

RE: M-2 Finding of Suitability to Transfer
M-2 Removal Action Report

Dear Mr. Levy,

Attached are EPA comments on the second version of the Removal Action Report addressing the Unexploded Ordnance, (UXO), Identification and Removal effort recently conducted on the property commonly known as M-2. The Removal Action Report documents the condition of the property that is the subject of the Finding of Suitability to Transfer.

Versions of these comments have been forwarded to you and the Corps of Engineers (COE), Huntsville Center of Expertise (HNC) previously, and followed by extensive discussions. However, numerous issues and concerns remain unaddressed in the second version of the Removal Action Report.

Our primary concern as discussed during BCT meetings is that anomalies identified in the initial survey were either not required, or they were required, but nothing was found at the identified location. These disparities were not explained in the Removal Action Report, so the Agency can not conclude that the clearance supports the intended reuse. Because the Army COE HNC is the Nation's expert with regard to explosive safety, and UXO detection and removal, EPA believes the COE has a duty to fully document and accurately characterize the extent and level of success of this, and any, UXO removal actions. The Finding of Suitability to Transfer currently states that all UXO were removed, while the report does not support this conclusion. In the absence of a promulgated Range Rule and associated risk assessment methodology, a

scrupulously accurate depiction of the Removal Action must be presented to the potential transferees. During the most recent discussion with HNC representatives, they indicated that HNC believes that all UXO with the potential for human contact has been located and removed. EPA has provided two sets of comments regarding the lack of support in the RAR for such a finding.

EPA has repeatedly requested HNC to fully document their removal effort plans and logic so that a meaningful review of those plans can be conducted. Additionally, EPA has requested that HNC address our comments on the M-2 field work and the conclusionary documentation of that field work. Numerous issues and concerns remain unaddressed despite EPA efforts to support HNC work efforts on the M-2 property. Numerous meetings, phone calls and e-mails have proved to be ineffectual in resolving these problems. Further dialogue between EPA and HNC regarding the M-2 property appear unlikely to change the Army's response.

This letter and the attached comments constitute EPA comments on both the M-2 Removal Action Report, and the M-2 Finding of Suitability to Transfer document. Please attach our comments and this letter as Unresolved Regulatory Comments to all transfer documentation and the subject report. Please forward final versions of all transfer documents and the final version on the subject report to EPA for inclusion in our program files.

Should you have any questions, please contact my replacement on this project, Mr. Doyle Brittain at the letterhead address or at 404-562-8549.

Sincerely,

Bart Reedy

cc: P. Stroud, ADEM

EPA Comments On
Draft M2 Parcel Ordnance and Explosives
Final Removal Action Report M2 Parcel
Fort McClellan, Alabama
dated September 20, 2000

EPA's review of the M2 Parcel Ordnance and Explosives Final Removal Action Report M2 Parcel Fort McClellan, Alabama dated September 20, 2000 [Report] identified that many previous comments have been adequately and appropriately addressed. However, the comments which were not adequately addressed are listed and discussed below and are critical comments (see Revised Removal Report Specific comments below) that still need to be resolved or forwarded through the appropriate explosive safety certifying channels to the Department of Defense Explosives Safety Board prior to EPA's full acceptance of a "Finding of Suitability for Transfer (FOST)." These comments must be resolved before it can be *stated with any certainty* that all of the potential UXO material has been removed from the site.

ADDITIONAL REMOVAL REPORT SPECIFIC COMMENTS

1. The Department of Defense Explosive Safety Board (DDESB) requires an amendment to the Explosive Site Safety Submission (DDESB-KO Memorandum, subj Guidance for Clearance Plans, dated 27 Feb 98, section 14) when a major change is made in the work plan. General Comment 5 as well as Specific Comment 5 below, both of which refer to Section 5.3.5.5.2 (1) of the work plan for this project that specified ". . . excavate all metallic anomalies will be excavated..." The removal report indicates that there were anomalies that were left on the M2 Parcel or that "anomaly discrimination took place on selected grids due to the large amount of metallic debris found (e.g. nails)." EPA considers this to be a key critical change from the work plan. This change was not coordinated with either regulatory agency nor DDESB. (***RESPONSE: We do not agree that this represents a major change or a "key critical change from the work plan" requiring amendment to the ESS. The example cited above is not a deviation from the work plan. As structured, the example implies that the work plan, section 5.3.5.5.2 (1), requires that "...all metallic anomalies" within the M2 Parcel will be excavated. This was not the intent nor the meaning of the Section 5.3.5.5.2 (1), which more fully states that "... all metallic contacts within a 1 m radius of the interpreted target location" will be excavated. Interpreted target refers to a target that has been purposely selected after completing a thorough review and evaluation of the processed geophysical data and therefore does not include every metallic contact that may be present on the site. The work plan describes the process of "quantitative interpretation and dig sheet development", wherein the processed geophysical data are discriminated to select only those anomalies that are suspected to be potential OE meeting the target criteria. This discrimination process is incorporated, by reference, from Section 5.8 of the Final General Site-Wide Work Plan, into Section 5.7 of the M2 Parcel work plan).*** Tables 1,

2, and 3 provide break outs of un-discriminated (Table 1) and discriminated grids (Table 2) (along with the number of no finds/no hits for each), as well as 45 primary anomalies that were not excavated in discriminated grids (Table 3. Discriminated Grids- Un-excavated Primary Anomalies). Since this parcel is slated for "Unrestricted Use for Construction", this change creates a high level of uncertainty with respect to the adequacy of the removal action, particularly with the number of "not excavated primary targets" in the discriminated grids. It cannot be said with certainty that no unexploded ordnance remains in this parcel. **(RESPONSE: See FW response to EPA "Evaluation of Response" for comment No. 7).**

2. DDESB-KO Memorandum, subj Guidance for Clearance Plans, dated 27 Feb 98 Section 13 and AR 405-90 requires the removal report with all comments as well as specifically in AR 405-90, Section 2-2, Contaminated Real Property, a. Explosive hazards states "Where ammunition or explosives are known or suspected to exist— (1) Proposals to dispose of property will contain information required by AR 385-64, Appendix, paragraph 10-3.C.2, and will be forwarded through COE and OASA(I&L) to the Department of Defense Explosives Safety Board (DDESB) for **prior approval.**" Additionally, the draft "Finding of Suitability for Transfer" dated September 2000 does specify (Section 3.9) that the "deed will contain a notice..." in the Environmental Protection Provisions (EPP) of Attachment 1 to the draft FOST. However, there is no specific language in the EPP that provides the required notice to future land owners that this parcel contained OE and that there may be (see Comment 1 above) a high likelihood of OE being found during any excavations. **(RESPONSE: This comment will be addressed in the FOST).**

EVALUATION OF RESPONSES TO COMMENTS

The comment numbers used below are those used in the original set of comments. If a comment number is not included, it indicates that the responses to comments and inclusion of these responses were satisfactory.

General Comments.

1. **Comment.** This document needs a thorough quality control/quality assurance verification and editing prior to regulatory agency review. Additionally, this report should comply with the Corps of Engineers (COE) Data Item Description(DID) (OE-030) Site Specific Final Report dated 3 Mar 00. For example, no cost data is found in the report as required by the DID. Additionally, while there is reference to COE Quality Assurance checks there are no specifics of their findings in this report.

Response. The revised document will receive a complete review prior to re-submittal. (2) The report complies with DID OE-FMC-030, Site Specific Final Report. (3) DID OE-FMC-030 does not require inclusion of cost data, however, the information will be provided in a new appendix (Appendix I) (4) Specifics on the findings of COE Quality

Assurance will be appended to the revised report as a new appendix (Appendix H).

Evaluation of Response. The appendices were included; however, the COE QA appendix does not fully address the specifics of the rationale nor standard operating procedures used during their sampling. (**RESPONSE:** *See response to comment #9*).

2. **Comment.** This document contains no certification of geophysical teams, nor the processes or procedures used as specified in Reference 11, Section 5.9.2 which states". Personnel selected to perform target reacquisition will first be certified by Foster Wheeler Environmental in the procedures and use of the selected navigation and detection instruments. The process will certify the team's ability to pinpoint target anomalies of known, documented, locations, and within the accuracy as required by CEHNC DID OE-005-05 (Geophysical Investigation plan). The certification will document the names of the personnel, the instruments used, and the team's ability to locate the targets within the DID specified criteria."

Response. The referenced certification process was not implemented during the M2 Parcel project. The certification process was developed in response to an EPA comment received on the *Draft* General Site-Wide Work Plan and was included in the revised General Site-Wide Work Plan submitted for final review September 14, 2000. Section 5.9.2 referenced above is in the revised General Site-Wide Work Plan submitted September 14 and was incorporated by reference into the Final M2 Parcel Work Plan on July 28, 2000, although at the time Section 5.9.2 did not include the certification process. The reacquisition process at the M2 Parcel began prior to this time on July 25.

Before preparing this certification process, FW did not have a formal certification process. We have relied on highly qualified FW professionals that have been well-trained in the use of both the USARADS and EM 61 instruments. Their experience and knowledge has come from real-time, on-the-job, training under the supervision of more experienced operators.

To address the concerns of EPA, a discussion of the process employed to verify that the reacquisition was being performed in compliance with the work plan and standard procedures will be included in the Quality Control section of the removal report.

The following text has been added as **Section 3.0.2:**

To provide assurance that anomaly reacquisition was being performed in compliance with the M2 Parcel work plan and the standard procedures contained within the plan, the UXO Quality Control Specialist (QCS) performed surveillance checks of the teams as they located anomalies and placed the pin flags marking the anomaly location. The QCS recorded his observations and/or conclusions on the Surveillance Form. The surveillance checks verified that the reacquisition process was being performed in accordance with the M2 Parcel work plan procedures. (Surveillance Forms are included in Appendix C,

Quality Control Documentation).

Evaluation of Response. The response does not completely address the issue. Anomaly reacquisition is only one part of the detection and clearance process; this comment encompassed the entire process, from original data acquisition through anomaly identification, reacquisition, and intrusive investigation. In the absence of a certified process, the Army must demonstrate that adequate quality control/quality assurance procedures were applied to each step of this process.

Adequate QA/QC includes not only surveillance of all associated field procedures, but also random inspection using a valid acceptance sampling methodology (i.e. MIL-STD 1916) of the resulting product (the cleared land). *(RESPONSE: The work procedures and the quality control/quality assurance processes used for detection through intrusive investigation were described in the site specific M2 Parcel work plan and the general site-wide work plan. Quality control of the detection and data analysis phases of activities were accomplished by appropriately experienced and trained Foster Wheeler (FW) geophysicists. Quality control during the intrusive investigations required a combination of surveillance in the field by the FW Quality Control Specialist (QCS) and the FW geophysicist's evaluation of dig results to judge whether the identified target had been recovered. Surveillance reports document QCS activities. Final quality assurance (QA) was provided for each grid by the CEHNC Safety Representative through a process wherein he independently surveyed a percentage (10 to 30%) of the open (i.e., not excavated) area for OE (see Section 3.2.3 of report). All 105 grids passed this later QA by the CEHNC).*

3. **Comment.** The database compact disk should also include all process and unprocessed geophysical data. Since this report is part of a proposed "closeout of the site" and potential transfer, the requirements found in References 3-8 should be reviewed and all data requirements should be verified as part of this report.

Response. The data has been included on compact disk (CD) provided with the revised report (Appendix A).

Evaluation of response. An additional CD with geophysical data was included with the revision. The readme.txt file included on the CD should be revised to include further information about the file-naming conventions used for the raw and processed data files (i.e., it seems that the grid number, geo team and acquisition date are all included in the file name). *(RESPONSE: Modification of the Readme text file would require generation of new CDs. In lieu, an information sheet will be provided for inclusion into Appendix A. The information sheet will include further information about the file-naming conventions used for the raw and processed data files).*

5. **Comment.** Any deviations from the approved Work Plan (reference 11) or other M2 documents (References 10 and 12) including the approved Site Safety submission should be explained in the body of this document. For example, Section 5.3.5.5.2 (1) of the

work plan specifies that "...excavate all metallic anomalies...", however the report indicates that there were anomalies that were left on the M2 Parcel or that "anomaly discrimination took place." (See general comments 4 above and specific comment 2 below.)

Response. The example cited above as a "deviation from the approved work plan" is not a deviation. As structured, the example implies that the work plan, section 5.3.5.5.2 (1), requires that "...all metallic anomalies" within the M2 Parcel will be excavated. This was not the intent nor the meaning of the Section 5.3.5.5.2 (1), which more fully states that "... all metallic contacts within a 1 m radius of the interpreted target location" will be excavated. Interpreted target refers to a target that has been purposely selected after completing a thorough review and evaluation of the processed geophysical data and therefore does not include every metallic contact that may be present on the site. The work plan describes the process of "quantitative interpretation and dig sheet development", wherein the processed geophysical data are discriminated to select only those anomalies that are suspected to be potential OE meeting the target criteria. This discrimination process is incorporated, by reference, from Section 5.8 of the Final General Site-Wide Work Plan, into Section 5.7 of the M2 Parcel work plan.

Evaluation of response. There are indications that not all metallic contacts within a 1 m radius were in fact excavated. ***(RESPONSE: This is not a correct observation. The procedure was to clear the area within 3 feet of the anomaly flag)***. The most obvious example is the discussion in Section 3.0.3, regarding the QC of Grid E11. The 5th sentence of this section states that "Based on the results of the test, the UXOQCS concluded that the dig teams were detecting and removing the targeted items adjacent to the flags and were leaving only non-OE scrap." This implies that metallic contacts which, in the judgement of the dig teams (not the geophysicists) were not OE-related, were not being excavated. Also, see additional specific Comment 1 above. ***(RESPONSE: At Grid E11, the dig teams were excavating the target items; however, when all that was being found was metallic scrap and convinced that further excavation would only reveal more of the same, digging at the flag and in the near vicinity of the flag was terminated)***.

6. **Comment.** Additional comments may be provided based upon a review of the "Statement of Clearance" and the "Finding of Suitability" documentation.

Response. Comment noted.

Evaluation of response. No Statement of Clearance has been provided for review and comment. Additional specific comment 2 above refers to the FOST. ***(RESPONSE: A Statement of Clearance was provided with the revised text section submitted 6 November , 2000)***.

Specific Comments.

4. **Page 10, Paragraph 2.2.5 Data Processing and Analysis.** This discussion should include a description of the differences in processing between the “undiscriminated” and “discriminated” grids, and state which grids fall into which category. The author should add the background noise and the “signal to noise ratio” that was used on this parcel for the various types of expected ordnance as part of an explicit “dig criteria” discussion. Additionally, the author should provide an explanation for this deviation from the Section 5.3.5.5.2 (1) of reference 11.

Response. There was no difference between the data processing for the discriminated versus undiscriminated grids. The dig criteria that were used are stated in the report. A combination of signal intensity relationships, acquisition path geometry, and subsequent 2D shape of the anomaly were used to select targets. For undiscriminated grids, all potential metal targets were selected except those interpreted to be utilities. For discriminated grids, discrimination was based on the analysis of the excavation results from the undiscriminated grids, as well as the initial investigation of the discriminated grids. After the analysis of the excavation results from the first several discriminated grids, the discrimination protocol remained constant for the remaining grids that were discriminated.

Discriminated grids contained priority (p) and validation (v) targets. Twenty percent of the validation targets were excavated to exhibit the repeatability of the discrimination process. Validation targets that were excavated were termed quality (q) targets in the Microsoft Access database. The results for the undiscriminated and discriminated grids are presented in the Microsoft Access database.

The referenced paragraph has been revised to read as follows:

The data were processed and analyzed in concurrence with the general processing/analysis sequence portrayed in the General Site-Wide Work Plan. Target selection criteria were based on the smallest OE objectives of interest at the site. The selection of a target was based on the relationships between the signal intensities of Channel 1, 2, and 4, data acquisition path geometry, surrounding background characteristics, and the areal shape of the potential target. In general, signal intensity peaks separated by more than a 1 meter distance were selected as individual targets unless the characteristics of the target (shape, signal intensity, and horizontal gradient) indicated a singular target.

For undiscriminated grids, all potential metal targets were selected except those interpreted to be utilities. For discriminated grids, discrimination was based on the analysis of the excavation results from the undiscriminated grids, as well as the initial investigation of the discriminated grids. After the analysis of the excavation results from the first several discriminated grids, the discrimination protocol remained constant for the remaining grids that were discriminated. Discriminated grids contained priority (p) and validation (v) targets. Twenty percent of the validation targets were excavated to exhibit the repeatability of the discrimination process.

Validation targets that were excavated were termed quality (q) targets in the Microsoft Access database. The results for the undiscriminated and discriminated grids are presented in the Microsoft Access database included on the attached compact disk (CD) in Appendix A.

Evaluation of response. This is a partial response to the comment. The text still does not contain a list of undiscriminated and discriminated grids. **(RESPONSE: Undiscriminated grids: A13-15; B00/01, 13-15; C05-08,11-15; D04-08,11-15/16; E05-08,11,12,14,15; F14/15; and G13/14,15,16/17. Discriminated grids: A00-12; B02-12; C01-04,09,10; D01/02,03,09,10; E02/03,04,09,10,13,16; F03-11,12,13,16/17; G03/04/05,11,12; Ditch A; and Ditch B)**

7. **Page 12, Paragraph 3.1 Quality Control.** The Quality Control effort described in this section does not fully address data quality issues. The author should greatly expand this section to fully address the data quality issues. For example, there are numerous anomalies that could not be re-acquired for intrusive investigation, although the coil readings given on the dig sheet are significantly above background (for example, see anomalies #43 and #52 in grid D3). There is no indication that any effort was made to determine the reasons these anomalies could not be re-acquired.

Additionally, there are several "undiscriminated" grids where more anomalies were identified on the dig sheets than were intrusively investigated (for example, see grid C9). There are also instances of discriminated grids with more intrusively investigated anomalies than are contained on the dig sheets provided (for example, see grid D3).

Response. *This section has been expanded. See revised Section 3.1.*

Where it is indicated that a anomalies could not be reacquired, yet the coil readings "...are significantly above background": While it may appear that this is the case, the geophysicist made decisions to re-investigate anomalies based on an evaluation of several factors, including the coil readings, background noise, how many lines the anomaly is on, the size and shape of the anomaly, and the location of the anomaly on a line. With respect to anomalies 43 and 52, the geophysicist did not consider these to be significant anomalies. There is high background noise and if you subtract the background noise these anomalies do not look so impressive. Arguably, the background is elevated approximately 12 mV at both anomalies which relegates anomaly 43 to a c2 of 3 and anomaly 52 to a c2 of 11. In the geophysicist's judgement those anomalies aren't as significant compared the other anomalies selected for reinvestigation.

Where there are more anomalies identified on a digsheet than were intrusively investigated: This discrepancy for undiscriminated digsheets has been corrected in the revised databases. However, for discriminated digsheets the same situation often existed, the reason being that the digsheet listed priority (p), validation (v), and quality (q) targets. Only those identified as p's and q's were to be investigated and only those were recorded in the investigation databases. (4) Where there are more intrusively

investigated anomalies than are contained on the dig sheets: Some grids were investigated prior to discrimination. After discrimination, only priority and validation targets were listed in the digsheet databases.

Evaluation of response. See Figure 1 (following references), plot of information on No hits, No finds, UXO , OE debris and the Table 1 (Undiscriminated Grids- No hits/No finds), Table 2 (Discriminated Grids Primary Targets- No hits/No finds), and Table 3 (Discriminated Grids- Un-excavated Primary Anomalies). The process of using undiscriminated and discriminated grids is a critical change from the work plan and raises the level of uncertainty in the overall process. There still are numerous anomalies that were primary picks that were no hits/no finds and not excavated. These all need to be further reviewed and adequately **verified and certified** as to their potential for being OE. ***(RESPONSE: (1) Again, the fact that grids were discriminated as opposed to investigation and digging all metallic contacts is not a deviation from the approved work plan (Also see response to comment #5 above).***

(2) Further explanation and clarification is necessary regarding “primary picks” reported as no findings or not excavated.

The anomalies listed in Table 1 were investigated and reported as “no hit” or “nothing found”. These were in grids that had not been discriminated. The reported findings were evaluated by the geophysicists and based on the characteristics of the signatures, determined that had these grids been discriminated, these specific anomalies would not have been selected for investigation. One of the anomalies (G16/17, anomaly 23) was picked for reinvestigation. Reinvestigation findings consisted of cultural metallic scrap (6 inch nails and staples) (see Table B-2, Appendix B).

(3) The grids listed in Table 2 were discriminated grids. The first 29 anomalies listed in Table 2 (A05, Anomaly 1 through F11/G11, Anomaly 39) were primary targets excavated with no findings. The results were evaluated by the geophysicists and, with one exception (A12, Anomaly 2), were excepted as valid and not selected for reinvestigation. Anomaly 2 was reinvestigated with a finding of 4 nails (see Table B-2, Appendix B).

The remaining anomalies listed in Table 2 (A00, Anomaly 12 through G03/04/05, Anomaly 33) were excavated with no findings. These anomalies were not selected for reinvestigation because they were within the exclusion zone adjacent the highway and in order to reinvestigate, would have required a second closing of the highway and further inconvenience to the public. Furthermore, the grids in which these anomalies were located had already been checked and approved by both the FW Quality Control Specialist (QCS) and the CEHNC Safety Representative. On the day that these grids were excavated (August 20, 2000) each grid was subjected to a quality control check by the FW QCS and a quality assurance check by the CEHNC on-site Safety Representative. Additionally, the fact that the road had to be closed to perform the

removal action, and that any follow-up investigations would demand a second road closing, the on-site Safety Representative surveyed up to 30-percent of the open areas to ensure that the area had been as thoroughly cleared as physically possible. There were no ordnance items found during the QA check. Anomalies investigated during the QA were identified as nails, several can lids, hot rocks and small pieces of non-OE metal. All of the grids surveyed by the CEHNC on-site Safety Representative passed the QA survey. Completed and signed CEHNC Form 948's certifying QA passage of each grid are included in Appendix C of the report.

(4) Table 3 lists 45 primary anomalies that were not excavated. Forty-two (42) of the anomalies are within seven grids (A00, A01, A02, B02, C01, D01/02) located along the western border of the site, adjacent and within the 200 ft exclusion zone from the highway. These grids along with 13 others, also located within the 200 ft exclusion zone, were investigated on August 20, the day the highway was closed to permit intrusive investigations to proceed. Prior to commencing the intrusive operations, it was decided that anomalies that were considered to be related to the buried utility pipeline and/or the bordering fences along the west and south sides of the site did not require investigation. Of the 42 anomalies, 19 are documented in the database as being related to the buried utility pipeline and/or the bordering fences. These 19 anomalies were therefore not excavated. The rationale for the remaining 23 (of 42) anomalies not having been excavated is unsure. Speculation is that the flags marking the anomaly locations were pulled in error.

The other three primary anomalies that were not investigated were located in grid A03 (an#13), Ditch B (an#6), and F05 (an#72). The rationale for these 3 anomalies is also unclear.

In the effected grids referenced above, a total of 257 anomalies were investigated. It is worth noting that within these same grids, all that was found was Non-OE debris --- not a single finding of OE or OE- related debris was recorded.

9. **Pages 12-13 Section 3.2.2 CEHNC Quality Assurance.** The author needs to provide a full discussion of the QA checks conducted; specifically, while an initial QA of three grids were conducted there is no explanation for the choice of these three grids nor how the grids "passed the ..QA process." Additionally, there was a subsequent QA of three other grids using another geophysical instrument. What standard operating procedures were used during both of these QA checks and what processing of the geophysical data took place and the results. The author should also provide the test results of the GEM3, since this instrument was not of the original geophysical prove out. Additionally, QA of each grid was also performed by the on-site CEHNC Safety Representative. This QA consisted of surveying a portion of the open area (i.e., non excavated areas) within each grid with a Schonstedt 52 CX Magnetic Locator instrument and confirming that no OE items of concern were present. For all the grids except those located along the highway and within the 200 ft distance of the road, approximately 10 to 15-percent of the open

area was surveyed by the CEHNC Safety Representative. For the grids located along the highway, up to 30-percent of the open areas was surveyed. All of the grids surveyed by the CEHNC Safety Representative passed the QA test. Again, the author should provide the specifics of the rationale for what areas were QA's and the specific results of each grid, as well as the test results that show that the Schonstedt can detect the anomalies to the depth required by reference 11.

Response. The CEHNC has prepared a QA report describing rationales, procedures and results and is included in Appendix H.

Evaluation of response. The QA report does address many of the comments. However, it still does not answer the question "What standard operating procedures were used during both of these QA checks and what processing of the geophysical data took place and the results". It also does not answer the request that "The author should also provide the test results of the GEM3, since this instrument was not of the original geophysical prove out." No specifics of critical, major or minor defects during QA that cause a failure have been identified either. Additionally, the COE QA post processed the raw detector data for comparison to the contractor's anomaly picks. The author should state which segments were processed, what the software for processing was, and the specific results.

(RESPONSE):

(1) What SOP's were used during both QA checks?:

Manufacturers SOP's were followed, supplemented with the following additional QC elements:

On the first day of the project, before surveying, lay out a 100' non-metallic tape in a quiet area. Run the following test after having run a static test as outlined below in steps 7 through 10.

- 1. Run approx. 100' line going one direction (N).*
- 2. Run approximately 100' line in reverse direction (S).*

Is the background line data repeatable?

Put target (M69/ball hitch or other similar target) on clean area of line (25' or 50' or 75'?)

- 3. run 100' lane in one direction with spike in it.*
- 4. run 100' lane in opposite direction with spike in it.*

Are the 2 readings over the target item approximately the same?

- 5. Repeat item 6 walking very fast.*
- 6. Repeat item 7 walking very slow.*

Compare the location of the target item with the data peak. The difference is your

location error that is typically caused by the temporal time lag of the detector (normally the problem) or the spatial correction due to placement of the location device (rarely).

Daily. For both the EM61 and the EM61HH, each morning of their use, perform the following using the exact same quiet area: zero out the instrument.

7. For the EM61, put polycorder on automatic & sample rate planned for use in the survey. Shake cables to make sure there are no shorts in cable & connectors while watching readings. Tape cables down.

8. Test each person who will be on-site and near the equipment to ensure they are "metallic free" by having each person approach the detector while it is in a stationery mode and observing any deviations from background readings.

9. Static test system for 3 minutes.

9. Static test with a spike for 3 minutes (round metal object such as a M69 is best to use as the spike).

10. Graph the data in Excel. Is there noise? Anything greater than +/- 3 mV for the EM61 is high. If there is noise, look for noise source and eliminate.

For each grid, use three files. Run the first line as one file, the remaining grid as the second file, and repeat the first line as the third file. The data from the first and third should pretty much overlay each other in an Excel line plot.

(2) What Processing of the geophysical data took place and the results of the processing?

Several different software packages were used on the data sets to evaluate the data including but not limited to:

Chemrad Analyze software

Golden Software Surfer Package

CEHNC U-Hunter Program

Geosoft Mapping System - UX-Detect

Microsoft Excel Spreadsheet Package

The packages were used to look at track maps, grid statistics, profile plots, shadow and contour plots. A more comprehensive checklist of the items checked for are located in section 3.3 of Appendix H - Quality Assurance Audit Evaluation. The final results of the analysis are presented as Geophysical Map Representations in Sub-Appendix A of

the - Quality Assurance Audit Evaluation Report.

(3) Identify the specifics of critical , major or minor defects during QA that cause a failure:

There are well over a hundred of specific details that can cause a failure, whether critical , major or minor in the "cause-effect" relationship in this type of survey. The results of these failures can range from the existence of false negatives, (an unacceptable condition related to a critical defect), to a high false positive ratio (higher costs for excessive non-OE digs, inefficient but acceptable if required to minimize potential of false negatives. This can be either a major or minor defect depending upon severity of the condition.) The minor defects are typically related to small positioning errors which require a larger area to be excavated to find the anomaly. The six (6) layer Quality Control Element Structure utilized on this Audit as identified within Appendix H - Quality Assurance Audit Evaluation was designed to identify and quickly fix any errors found within the data. Refer to Section 3 of the evaluation for specific details.

(4) State which segments of raw detector data were post processed for comparison to the contractors anomaly picks:

Grids A2, C3, C4, C7, D7, B13, C15, F15, G16, G17, D15, and D16 were processed by the government for comparison to the contractors anomaly picks. A subset of these grids, (C7, D7, C15, F15, G16, G17), were selected for remapping by the government due to discrepancies between the lists. The results of these resurveying efforts resulted in a validation of the contractors original results as identified in the Quality Assurance Audit Evaluation report.

(5) Provide the test results of the GEM3, since this instrument was not of the original geophysical prove-out:

A Readiness Review was performed by the Government QA Contractor (Geophex) on September 11, 2000 at McKinley Range test grid. The data and report are available by request. The items for Grid 1 were supplied to the contractor but Grids 2 and 5 are Government close hold information only (currently used for Performance contracting evaluations). Items in grid 5 included Mk2 hand grenades, 60mm mortars, 2.36 " and 3.5" rockets all excavated from Ft. McClellan. A second test was originally scheduled to be performed on September 12, 2000 at the Fort McClellan Test Grid but had to be cancelled due to the thick vegetation overgrowth that has reclaimed the site.

10. **Page 16 Section 5.0 Summary.** This summary states "An ordnance and explosives removal action was performed on the M2 Parcel at Fort McClellan beginning 22 May and ending during the week of 18 September, 2000. The action completed the removal action alternative of Surface Clearance and Subsurface Clearance to Depth, as approved in the final Action Memorandum. During the removal action, 3350 anomalies were intrusively investigated. Of these, only two UXO items were found. These were found on the surface and were safely destroyed onsite by UXO specialists. Consistent with the type of training activities that were suspected to have taken place within the M2 parcel, nearly all OE-

related were found very near the surface.” The author needs to revise this section based upon previous comments. Additionally, the author should explicitly state what the recommended “certification” for this parcel is based upon the results of the removal action.

Response. Concur. Section 5.0 Summary has been expanded.

Evaluation of response. Section 5.0 has been expanded. However, the certification recommendation has not been included in the summary, i.e. Unrestricted Use et al. *(RESPONSE: The last paragraph of the section provides a statement indicating that residual OE risk may still remain at the property. In addition, certifications were prepared and provided at the beginning of the text revisions submitted 6 November, 2000).*

Table 1. Un-discriminated Grids- No hits/No finds

No Hits/No Finds - Un-discriminated Grids				
Grid	Anomaly	c1 Reading	c2 Reading	Description
A13	4	4.93	4.93	No hit
A13	9	4.37	4.37	No hit
A13	15	4.18	3.62	No hit
A14	1	6.18	3.45	No hit
A14	3	43.5	9.81	No hit
A14	8	34.68	38.12	No hit
A15	3	10.93	7.93	No hit
F14/ F15	60	3.85	3.64	Nothing
A15	12	6.81	6.25	Nothing found
A15	14	4.56	4.18	Nothing found
A15	16	-6.3	16.37	Nothing found
A15	17	12.25	12.43	Nothing found
B14	3	5.12	4.14	Nothing found
B14	6	10.37	8.25	Nothing found
B14	12	23.12	16.12	Nothing found
B15	39	7.18	6.93	Nothing found
C05	2	29.87	34	Nothing found
C07	16	5.5	7.75	Nothing found
C07	58	9.62	6.06	Nothing found
C07	59	7	4.75	Nothing found
C07	60	-55.8	83.5	Nothing found
C11	1	8.83	7.89	Nothing found
C11	28	1.49	1.99	Nothing found
C12	9	11.09	12.83	Nothing Found
C13	2	3.04	2.85	Nothing Found
C13	6	5.64	4.61	Nothing Found
C13	9	1.41	0.82	Nothing Found
C15	1	2.97	2.1	Nothing found
C15	15	1.72	2.66	Nothing found
C15	20	2.99	2.98	Nothing found
C15	31	1.05	0.47	Nothing found
C15	32	1.44	0.47	Nothing found
C15	46	4.11	3.19	Nothing found
D04	16	38.41	8.33	Nothing Found
D04	22	3.81	4.4	Nothing Found
D04	42	0.44	2.56	Nothing found

No Hits/No Finds - Un-discriminated Grids

Grid	Anomaly	c1 Reading	c2 Reading	Description
D05	29	5.5	5.31	Nothing found
D06	19	5.5	5.5	Nothing found
D06	30	15.25	5.5	Nothing found
D06	31	4	3.25	Nothing found
D06	34	13	9.25	Nothing found
D11	13	17.1	3.51	Nothing found
D12	4	12.43	10	Nothing found
D12	17	11.12	7	Nothing found
D12	18	38.5	6.25	Nothing found
D12	21	3.81	2.5	Nothing found
D13	3	6.37	5.87	Nothing found
D13	4	9.56	7	Nothing found
D13	7	4.31	4.18	Nothing found
D13	19	2.12	1.2	Nothing found
D15/ D16	18	6.68	11.83	Nothing found
E05	27	6.25	7	Nothing found
E05	28	7.56	8.12	Nothing found
E05	35	7.56	9.62	Nothing found
E05	43	4	6.25	Nothing found
E12	8	8.5	6.81	Nothing found
E12	10	8.5	4	Nothing found
E12	12	16	10	Nothing found
E12	13	6.62	4.18	Nothing found
E12	14	7.37	3.25	Nothing found
F14/ F15	17	5.67	5.94	Nothing found
F14/ F15	20	5.65	7.66	Nothing found
F14/ F15	30	0.17	1.07	Nothing found
G16/ G17	23	20.86	21.53	Nothing Found

Table 2. Discriminated Grids Primary Targets- No hits/No finds

No Hits/No Finds-Primary Targets in Discriminated Grids				
Grid	Anomaly	c1 Reading	c2 Reading	Description
A05	1	25.37	19.12	Nothing found
A05	3	15.43	12.75	Nothing found
A07	70	161.5	133	Nothing found
A07	72	285.25	266.5	Nothing found
A07	90	13	13.75	Nothing found
A08	35	11.5	7.75	Nothing found
A12	2	60.25	76.5	Nothing found
B05	4	11.93	14.87	Nothing found
B07	12	911.31	690.81	Nothing found
B08	31	21.25	18.25	Nothing found
D03	33	16.75	16.56	Hit moved from hole but nothing found
D09	2	12.7	12.68	Nothing found
D09	42	7.12	4.67	Nothing found
D09	49	3.82	-2.14	Nothing found
DitchB	1	24.25	22	Nothing found
DitchB	3	18.81	12.25	Nothing found
DitchB	4	17.31	14.5	Nothing found
DitchB	5	20.5	11.5	Nothing found
DitchB	10	18.25	15.25	Nothing found
DitchB	11	20.5	22.75	Nothing found
DitchB	13	17.31	20.5	Nothing found
DitchB	16	49.75	34	Nothing found
DitchB	17	12.25	8.5	Nothing found
DitchB	18	19	14.5	Nothing found
F06	3	22	19.75	Nothing found
F06	4	19.75	17.31	Nothing found
F06	33	20.5	18.25	Nothing found
F10	30	-53.3	65.7	Nothing found
F11/ G11	39	-149.65	159.73	Nothing Found
A00	12	77.52	17.74	Nothing found
A00	39	0.83	-3.28	No hit found.
A00	44	-9.56	5.14	Nothing found
A00	48	0.96	2.57	No hit found
A01	7	2.43	11.18	Nothing found
A01	16	8.92	3.59	No hit

No Hits/No Finds-Primary Targets in Discriminated Grids

Grid	Anomaly	c1 Reading	c2 Reading	Description
A01	58	-13.83	23.86	Nothing found
A01	63	-0.55	0.52	No hit
A02	34	5.41	5.21	Nothing found
C02	37	0.81	0.31	Nothing found
D01/ D02	16	2.59	2.86	No hit
D01/ D02	20	2.64	7.19	No hit
D01/ D02	40	8.48	9.2	Nothing found
D03	25	13.75	10.75	Nothing Found
D03	34	13	13.75	Nothing Found
D03	43	20.12	15.25	Nothing found
D03	45	9.06	11.5	No hit
D03	52	20.31	23.5	Nothing found
E02/ E03	4	41.31	17.5	Nothing found
E02/ E03	5	8.5	6.06	Nothing found
E02/ E03	7	15.06	15.25	Nothing Found
E02/ E03	9	10.18	9.81	Nothing found
E02/ E03	10	7	8.5	Nothing found
E02/ E03	12	13.56	13.75	Nothing found
E02/ E03	13	11.68	11.31	Nothing found
E02/ E03	15	8.87	9.25	Nothing found
E02/ E03	17	4	10	Nothing found
E02/ E03	20	13.75	9.81	Nothing found
E02/ E03	21	16	13.75	Nothing found
E02/ E03	26	14.5	7	Nothing found
E02/ E03	33	9.62	10	Nothing found
E02/ E03	37	11.5	10.75	Nothing found
E02/ E03	38	7	9.25	Nothing found
E04	9	1.56	31.93	Nothing found
F03	45	2.75	11.73	Nothing found
F04	4	2.24	2.5	Nothing found
F04	6	1.33	2.69	Nothing found
F04	12	0.22	3.41	Nothing found
F05	9	19.75	19.75	Nothing found
G03/ G04/ G05	2	10.15	11.31	Nothing Found
G03/ G04/ G05	33	2.07	4.05	Nothing found.

Table 3. Discriminated Grids- Un-excavated Primary Anomalies

Un-excavated Primary Anomalies – Discriminated Grids				
Grid	Anomaly	c1 Reading	c2 Reading	Description
A00	1	-9.56	5.14	Not Excavated
A00	2	16.17	9.61	Not Excavated
A00	9	5.61	8.66	Not Excavated
A00	11	53.23	13.8	Not Excavated
A00	26	3.58	10.78	Not Excavated
A00	31	0.81	1.21	Not Excavated
A00	41	21.87	10.19	Not Excavated
A00	43	22.72	9.06	Not Excavated
A00	50	-2.88	-0.71	Not Excavated
A01	5	4.3	7.08	Not Excavated
A01	42	16.93	7.65	Not Excavated
A01	76	16.31	3.98	Not Excavated
A02	3	3.13	4.4	Not Excavated
A03	13	15.25	12.62	Not Excavated
B02	3	22.56	19.75	Not Excavated
B02	6	11.5	8.5	Not Excavated
B02	13	-3.5	35.5	Not Excavated
B02	14	81.81	124.75	Not Excavated
C01	1	4.4	6.23	Not Excavated
C01	3	498.25	596.29	Not Excavated
C01	5	-0.82	12.06	Not Excavated
C01	6	4	7.01	Not Excavated
C01	7	30.72	7.63	Not Excavated
C01	8	26.24	23.68	Not Excavated
C01	12	26.08	35.78	Not Excavated
C01	15	7.91	6.12	Not Excavated
C01	17	33.66	11.94	Not Excavated
C01	18	-0.01	10.48	Not Excavated
C01	22	0.65	2.2	Not Excavated
C01	23	147.42	161.19	Not Excavated
C01	31	18.63	14.48	Not Excavated
C01	32	1.5	5.24	Not Excavated
C01	34	4.31	12.09	Not Excavated
D01/ D02	4	1.14	0.08	Not Excavated
D01/ D02	6	1.81	11.08	Not Excavated
D01/ D02	10	-5.96	-0.38	Not Excavated
D01/ D02	36	11.46	11.64	Not Excavated
D01/ D02	37	9.87	19.23	Not Excavated

D01/ D02	38	6.38	9.78	Not Excavated
D01/ D02	39	74.22	-	Not Excavated
D01/ D02	41	1.13	1.58	Not Excavated
D01/ D02	42	1.09	-0.17	Not Excavated
D01/ D02	43	-7.79	-2.86	Not Excavated
DitchB	6	34.75	35.5	Not Excavated
F05	72	27.62	29.12	Not Excavated

References.

1. Memorandum DoD/EPA *Unexploded Ordnance (UXO) Management Principles* dated 7 March 2000.
2. EPA's *Guidance on Conducting Non-Time-Critical Removal Actions under CERCLA* (EPA/540-R-93-057, August 1993)
3. EPA's *Guidance for Evaluation of Federal Agency Demonstrations that Remedial Actions are Operating Properly and Successfully Under CERCLA Section 120(h)(3)*, (Interim) August 1996
4. **CERCLA Section 120(h), and 40 CFR 373, Reporting Hazardous Substance Activity When Selling or Transferring Federal Real Property**
5. DoD/EPA *"The Environmental Site Closeout Process"* Nov 98
extract provide at Appendix A.
6. DoD 6055.9-STD *DoD Ammunition and Explosives Safety Standards* July 1999,
authorized by DoD Directive 6055.9 *DoD Explosives Safety Board (DDESB) and DoD Component Explosives Safety Responsibilities* July 29, 1996
7. Army Regulation (AR) 450-9, *U.S. Army Real Estate Transfer* 28 November 1998
8. **US ARMY ENVIRONMENTAL RESTORATION PROGRAMS GUIDANCE MANUAL**, APRIL 1998
Extract provided at Appendix B.
9. Engineer Pamphlet (CEMP-RT) 1110-1-18 *Engineering and Design Ordnance and Explosives Response* 24 April 2000
10. *Final Engineering Evaluation/Cost Analysis Report for the M2 Parcel Fort McClellan, Alabama* dated May 2000
11. *Final Engineering Evaluation/Cost Analysis Work Plan for the M2 Parcel Fort McClellan, Alabama* dated Apr 2000
12. *Final Engineering Evaluation/Cost Analysis Action Memorandum for the M2 Parcel Fort McClellan, Alabama* dated May 2000

Appendix A.

DoD/EPA *"The Environmental Site Closeout Process"* Nov 98 Extract

Section 1.5 BRAC Installations and Property Transfer Requirements.

"At BRAC installations or other installations at which a transfer of property is under consideration, there are additional requirements under CERCLA for site closeout. In particular, CERCLA § 120(h)(3) requires DoD to ensure that "all remedial action necessary to protect human health and the environment with respect to any [hazardous] substance remaining on the property has been taken before the date of such transfer." This provision has been amended over time to clarify the meaning of "has been taken," and to allow for leasing and transfer of property before all required remedial action has been completed. In addition, provisions for "early transfer" have been added. These requirements add to the overall documentation required to complete closeout of BRAC environmental sites, and need to be considered by the BRAC Cleanup Team when developing project schedules and time lines."

US ARMY ENVIRONMENTAL RESTORATION PROGRAMS GUIDANCE MANUAL,
APRIL 1998

Section 5.12 PROPERTY TRANSFER AND LEASE

Although Army regulations have provided for the sale and transfer of excess Army property, it was not until the passage of Public Law 100-526, the BRAC Act of 1988, that transfer of Army property became an Army priority. With the passage of subsequent BRAC laws and the Community Environmental Response Facilitation Act (CERFA) in October 1992, the DoD and the Army have placed more emphasis on the expeditious identification, cleanup, and transfer or lease of excess Federal property.

Under CERCLA Section 120(h), and 40 CFR 373, Reporting Hazardous Substance Activity When Selling or Transferring Federal Real Property, the Army remains liable for environmental cleanup on real property it transfers, even when the contamination was discovered subsequent to transfer. To protect the Army from disagreements as to the source of contamination subsequently discovered, the Army has established protocols to assess the condition of property prior to transfer.

DoD guidance and the passage of the CERFA have required changes in Army protocols for property transfer. Protocols to effect lease of Army property have similarly been revised. However, the DoD guidance on property transfer and lease continues to evolve.

For real property transactions, results of the Environmental Baseline Survey (EBS) evaluation will be documented in a Finding of Suitability to Transfer (FOST) for sales divesting title, or a Finding of Suitability to Lease (FOSL) for leases. FOSTs and FOSLs are not required for acquisitions. An Environmental Condition of Property (ECOP) is required for transfers of jurisdiction between Federal agencies. EBSs, FOSTs, FOSLs, and ECOPs shall be completed in accordance with DA PAM 200-1 and will follow the procedures found in AR 405-10 (concerning acquisition), AR 405-80 (Outgrants), and AR 405-90 (Disposals).

The FOST or FOSL are documents that presents the environmental condition of the property and associated land/use restrictions, covenants, and warranties required by law, regulation, or guidance to ensure the public, regulators, and DoD that the property is suitable for transfer or lease. Specifically, the FOST or FOSL are disclosure documents to inform people so as to limit future risk and liability. The FOST or FOSL is used by the real estate community to place stated restrictions, notice, covenants, and access clauses into a deed, contract, or Memorandum of Agreement/Memorandum of Understanding (MOA/MOU). The FOST and FOSL process develops restriction necessary to safeguard human health and the environment, and to ensure the effectiveness of future cleanup activities and remedies.

Section 5.12.2.2 Property with Release or Disposal

In the case of real property owned by the Army on which any hazardous substance was stored for one year or more, known to have had a release or disposal has occurred, each deed entered into transfer of the property of the United States to any other person must contain:

1. Identification of the type and quantity of hazardous material, to the extent that

information is available; the time that the storage, release or disposal took place; and description of the remedial action taken, if any.

2. Covenant warning that all remedial action necessary to protect human health and the environment has taken place, the remedial action is in the process of taking place, or the remedial action will take place in the future.
3. Clause granting the United States Government access to the property if future remedial action is necessary.
4. Listing of specified recommended restrictions on the use of the property, if any, to protect human health, safety, and the environment or the environmental restoration process. For remediated parcels such restrictions would include those documented in the ROD or DD.

Attachment 1.

Plot of No hits, No finds, UXO , OE debris and the No Hits table.