



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY GARRISON
FORT McCLELLAN, ALABAMA 36205-5000

August 3, 2005

Transition Force

Mr. Stephen Cobb
Alabama Department of Environmental Management (ADEM)
Hazardous Waste Branch, Land Division
P.O. Box 301463
Montgomery, AL 36130-1463

Dear Mr. Cobb:

This letter transmits responses to comments provided by the Department on March 28, 2005, regarding partial review of the Draft Engineering Evaluation/Cost Analysis, Bravo Area of the Redevelopment Area, document dated December 3, 2004, and requests your concurrence with the Army's recommendation for No Further Action in the M3-Remainder Area-PR of the Bravo Area.

I will set up a meeting with ADEM to discuss the Army's recommendation for No Further Action after the Department has reviewed these responses. The purpose of this meeting is to maintain open and continuing discussion prior to final decisions on the property. As pointed out in your comments, the Army agrees that additional information was necessary for the Department to assess the No Further Action recommendation for the M3-Remainder Area-PR.

A copy of this letter with the enclosure and attachments to the enclosure has been furnished to the Mr. Dan Cleckler, Joint Powers Authority; Mr. Buddy Cox, Alabama Department of Transportation; Ms. Michelle Beekman, Matrix Environmental Services; Mr. Jim Pastorick, UXOPro; and Mr. Dan Copeland, Huntsville Center Corps of Engineers.

If you have questions or require additional information, please contact me at 256-848-6831 or Mr. Dan Copeland at 256-895-1567.

Sincerely,

Ronald M. Levy
Environmental Coordinator

Enclosure

Response to ADEM Review Comments on Proposed NFA Areas
Draft – Bravo Area EE/CA December 2004
Fort McClellan, Alabama

The Bravo Area Site Characterization was done in two separate phases. The original sampling effort took place between April 2001 and August 2002 (page 3-2 lines 6-7). Investigation grids and three types of transects (data collection transects, delineation transects, and mountain transects) were apparently used in Fort McClellan's characterization effort. In July 2004, Additional Sampling was done in the M3-Remainder Area-PR. ADEM will refer to these transects as "supplemental transects".

"Mountain transects" done in 2001-02, and "supplemental transects" done in 2004, are different and it appears that clarification is warranted to avoid confusion. The 2001-02 "mountain transects" that Fort McClellan used in mountainous areas are 15 foot wide meandering paths that followed the contour of the land (page 3-5 line 34-35). The report states that "one anomaly was excavated every 290 feet along the 7.5 miles of mountain transects walked" (page 3-11, lines 2-3).

"Supplemental transects" were investigated during the July 2004 Additional Sampling of the M3-Remainder Area-PR (page 3-11, lines 30-31). The purpose of the supplemental transects was to provide data to ADEM to support the Army's proposed NFA recommendation in the M3-Remainder Area-PR. The work plan for this additional sampling included 12.5 miles of transects, 5 feet wide, that were to be investigated using a Schondstedt or other suitable hand held instrument. The work plan states that the "teams will dig all anomalies as found up to a total of 40 within each 290-foot segment", then every other anomaly up to a total of 100, and every third anomaly for the remainder of each segment.

On June 4, 2004, the Army submitted a response to ADEM's Review Comments on the *Draft Final Addendum to the Final Site Specific Work Plan- Bravo Area EE/CA Ordnance and Explosives Response*. This correspondence included the *Final Addendum to the Final Site Specific Work Plan- Bravo Area EE/CA Ordnance and Explosives Response*. To develop this work plan, Spencer Nelson and Mac Reed of URS (both then ADEM representatives) and Art Holcomb and Todd Biggs of Foster Wheeler met on February 6, 2004 to review the level of effort that would be required for the Army to appropriately reassess the proposed NFA areas to a sufficient degree that assessment results would completely and thoroughly characterize the NFA areas. Based on ADEM's understanding of the work completed for the supplemental transects, the Army and its contractor have not complied with the cooperatively developed scope of work. For several reasons, as documented in the comments below, the resulting NFA recommendation proposed by the Army for the M3-Remainder Area-PR does not seem to be supported by the information supplied in this document.

Army Response: Due to omissions and some errors in the Draft EE/CA report (explained in the response to general comment #1) the Army understands why the Department believes the Army did not comply with the cooperatively developed scope of work. The Army is very concerned with this issue and is requiring the contractor to again review the document. Additionally, pending adequate funding the Army is requiring the contractor to reorganize the information in the EE/CA into chapters by risk sector so that information pertinent to each risk sector will be included in the chapter on that sector. This should make study and review of the data less time consuming while providing a more complete and accurate picture of each risk sector.

After ADEM reviews the responses provided to these comments, the Army believes ADEM will agree it complied with the cooperatively developed scope of work for the M3-Remainder Area-PR NFA area. The Army remains convinced the area warrants a NFA determination and hopes ADEM will agree.

The following summary of findings in the M3-Remainder Area-PR, inclusive of the work performed in the supplemental transects, will be explained in the Army's responses to the ADEM comments:

- No UXO or OE was found during characterization (Table 3-1, page 3-37).
- The OE scrap (no explosive hazard) items found were anticipated based on the Archives Search Report.
- In the 65 supplemental transects, 212 anomalies were dug. Six were OE scrap (no explosive hazard) and the remainder were non-OE items.
- No 60mm OE/OE scrap items were found.
- No 40mm related OE/OE scrap was found in the NFA area, in the 50X50' grid around the item extending into the NFA area, or within 200 feet north, west, and south of the 40mm HE item that was found in the EBP area but near the boundary of the NFA area.
- The property is suitable for unrestricted use.

General Comments

1. In its June 4, 2004 correspondence to ADEM, the Army presented the *Final Addendum to the Final Site Specific Work Plan- Bravo Area EE/CA Ordnance and Explosives Response*. This Final Work Plan contained a map of the Bravo Area (Figure 6-24) that depicted the additional transects (supplemental transects) agreed to by ADEM and the Army. The map included in this work plan, Figure 6-24, delineates a large portion of the M3-Remainder Area-PR as "Residential Neighborhood" land use. This proposed land use contradicts the information in Chapter 4 of the report which states that the Army's OERIA process used the approved 1997 reuse plan (Page 4-20 line 30). In the 1997 reuse plan, the M3-Remainder Area is categorized as "Passive Recreation".

The Department understands that for residential land use, the maximum target OE density value should be no greater than 0.1 OE/acre. The Department also understands that for the M3-Remainder Area-PR sector, the Army performed the EE/CA sampling effort assuming "passive recreation" land use, which has a maximum target OE density value has of 1.0 OE/acre. Thus, it is unclear to the Department which OE density target value was used and if the amount of data collected to date is sufficient to support a passive recreation land use or if additional investigation is warranted since the future land use is reportedly going to be residential.

Furthermore, on the June 2004 map of the Bravo Area (Figure 6-24), the land use around the Yahoo Lake area is denoted as "McClellan Park System". The Department assumes such park system land will be considered equivalent to "active recreation" (moderate public usage) or "industrial" (significant public usage). For these land uses, the maximum OE density value should be either 0.5 or 0.1 OE/acre, respectively (page 3-4 lines 13-16).

The Army should clarify the projected land use and the target OE density value used for calculating the minimum sampling acreage, and clarify if the sampling performed to date is adequate and why this is so. Alternatively, the Army should update the amount of sampling that

is necessary to support the appropriate maximum OE density value. The revised land use also affects the OERIA risk assessment conclusions, as well. Please revise the report as necessary.

Army Response: The Army continues to use the 1997 reuse plan. The wrong base map was used for Figure 6-24 in the Work Plan Addendum. The purpose for the figure was to show the locations of the supplemental transects. The reuse shown on the figure was not used.

Although the Army accepts only the 1997 reuse plan which identified a land use of passive recreation for the M3-Remainder Area-PR risk sector, the Huntsville Center of Expertise, Corps of Engineers (HNC) was able to verify that the sampling effort and amount of data collected is sufficient to support “significant public usage” of this property. The HNC used the Minimum Discrimination Sub Module of the UXO Calculator, HNC 10 July 2001, and a target value of 0.1 OE per acre to calculate that a minimum of 22.79 acres must undergo intrusive investigation. Including the supplemental transects, the contractor actually intrusively investigated a total of 28.50 acres. Please see the below table for numbers that were used in and derived from the calculation. Please see responses to comment #4 for information related to the calculations.

No UXO or OE items were found in the NFA area. The target value of 0.1 OE item/acre allows for the highest level of land use and is recommended by HNC to support unrestricted use.

M3-Remainder Area-PR

Area Values are in Acres

Total Sector Area	Total Area Geophysically Surveyed	Percent of Total Sector Geophysically Surveyed	Area Intrusively Investigated As Grids	Area Intrusively Investigated As Transects
1,112	40.00	3.60%	14.71	13.79
Total Area Intrusively Investigated	Percent of Total Sector Intrusively Investigated	Minimum Intrusive Sampling Area Required to Test Target Density of 1.0 Items/Acre with 90% Confidence	Minimum Intrusive Sampling Area Required to Test Target Density of 0.1 Items/Acre with 90% Confidence	Intrusive Work To Date Sufficient to Test Target Density of 0.1 Items/Acre with 90% Confidence?
28.50	2.56%	2.31	22.79	YES

2. The supplemental transects completed in 2004 included transects numbered T-24 through T-65. These were the transects developed by TtFWI and URS (then ADEM’s representative) jointly during the February 6, 2004 meeting. These transects were intended to complete the characterization of the NFA areas in the Bravo Area. The Army issued the Final Addendum to the Bravo Area work plan in June 2004, and ADEM approved this work plan in a letter dated June 29, 2004. The work plan states that “The teams will dig all anomalies as found up to a total of 40 within each 290 foot segment”. The Department notes that this was to include every anomaly, MEC related or not. If an OE item or a piece of frag was found, a grid or star pattern was to be investigated around the item. The Army reportedly found no OE or frag, so no grids or star patterns were performed in the supplemental transects.

The Department has reviewed the information provided in the report regarding these additional transects. ADEM notes that the "Table of All Findings" (Appendix E) does not present any findings for these transects. The Department also notes that the report indicates that only six "OE scrap" items (37 mm TPT rounds) were found in all 41 transects. For a small number of the transect segments, the Army states that "Small Arms" were present. The map (Bravo EE/CA Overview) legend indicates that for a "No Metal Present" status, the transect is depicted in black and grey on the map. For "Non OE Scrap", the transect segment will shown in green on the map. Almost all of the transects numbered T-24 through T-65 are shown in black and grey. According to the work plan, all anomalies (up to 40) were to be intrusively investigated, and according to the map a large number of these transects did not contain any metal. Thus, unless the contractor performed up to 40 or more digs per 290 foot segment of nothing but magnetic soil and rocks, the Department must conclude that no digs were performed in those transects depicted as black and grey on the map.

Given past experience at Fort McClellan, the Department finds it unusual that 41 transects were investigated and that almost no digs were performed, as indicated by the information provided in the report and accompanying map. In the revised report, please document how many digs were performed for each segment of each transect. Also, please include in the "Table of All Findings" (Appendix E) the results of all the digs performed in these transects. If this information is not available, please state so.

Army Response: The EE/CA report will be revised to include the information and to correct the errors. The following is noted:

1. Information on the anomalies detected and dug and the intrusive findings for the supplemental transects was omitted from Appendix E. It will be included in the next version of the EE/CA report and is also provided as Attachment 1 to this response letter.
2. The Bravo EE/CA Overview map is incorrect in showing "No Metal Detected" in many of the supplemental transects and will be corrected.
3. Sufficient information regarding the work accomplished in the supplemental transects was not provided in the EE/CA report.

The work plan addendum stated all anomalies up to a total of 40 within each 290' segment of each supplemental transect would be dug, then every other anomaly up to a total of 100, then every third for the remainder of each segment. However, crews did not find 40 or more anomalies in any segment of any supplemental transect; thus, they dug **every** anomaly they located in every supplemental transect. The following table lists the supplemental transects, the number of anomalies (equal to the number of digs) in each transect, and the number of OE Scrap items found. Crews dug 212 items in the 41 supplemental transects, found 6 OE Scrap items (all 37mm TPT, EE/CA Table 3-1), and 206 non-OE scrap items (Attachment 1). No OE or UXO was found. According to the agreement with ADEM, OE and OE scrap were to be logged while non-OE items were counted as items found but were not recorded.

Several transects in the table below were shown on the Overview map as having no metal detected; but as indicated by the anomalies, there was metal there. The map will be revised. The contractor will review and compare all other data in Appendix E with the Overview map to ensure accuracy for the NFA risk sector as well as for all other risk sectors.

Anomalies (Digs) in Supplemental Transects

Transect #	Date	# of Anomalies (Digs)	# of OE Scrap Items	Transect #	Date	# of Anomalies (Digs)	# of OE Scrap Items
25	7/7/2004	0		47	7/12/2004	7	
26	7/7/2004	0		48	7/13/2004	10	
27	7/27/2004	1		49	7/13/2004	15	
28	7/26/2004	1		49	7/12/2004	0	
29	7/26/2004	2		50	7/15/2004	25	
30	7/7/2004	2	1	51	7/15/2004	20	
31	7/6/2004	1	2	52	7/14/2004	2	
31	7/7/2004	5	1	53	7/27/2004	0	
32	7/19/2004	0		54	7/14/2004	1	
33	7/12/2004	0		55	7/20/2004	0	
34	7/12/2004	0		56	7/14/2004	1	
35	7/28/2004	2		57	7/14/2004	2	
36	7/22/2004	9		57	7/13/2004	0	
37	7/26/2004	0		58	7/13/2004	10	
38	7/21/2004	1		59	7/20/2004	18	
39	7/21/2004	3		59	7/19/2004	10	
40	7/13/2004	0		60	7/22/2004	11	
41	7/13/2004	0		60	7/21/2004	8	
42	7/15/2004	0		61	7/21/2004	12	
43	7/28/2004	0		61	7/20/2004	8	
44	7/14/2004	0	1	62	7/19/2004	15	
45	7/15/2004	0		63	7/7/2004	1	1
46	7/12/2004	8		64	7/7/2004	0	
				65	7/7/2004	1	

Total Digs = 212

3. ADEM understands that the purpose of this EE/CA is to evaluate the presence of OE that may exist within the Bravo Area, and to identify removal actions that are warranted to address such OE contamination or to evaluate potential risks to human health and the environment that result from the presence of such OE. The Department is concerned with the finding of five expended 75mm shrapnel projectile rounds in the northern and central portion of the M3-Remainder Area-PR.

Transect Number	Number of OE/OE Scrap Items	Depth of item
T03	2 expended 75mm shrapnel projectile	0"
T08	1 expended 75mm shrapnel projectile	0"
T10	1 expended 75mm shrapnel projectile	0"
T12	1 expended 75mm shrapnel projectile	0"
T13*	1 expended 75mm shrapnel projectile 1 37 mm HE projectile, UXO	0" 3"

*T13 is in the M3-1L Suspect Area 2-PR, which is the small area contained within the center of the M3-Remainder Area-PR. It is included in the discussion of this area to help illustrate the Department's concerns.

- The 75 mm shrapnel projectile has a thin shell and was reportedly not designed to kill by high explosive or fragmentation. Instead, it was intended to kill by ejecting shrapnel, usually lead or steel balls. They are likely to be, but not always, found on the surface.
- The 75 mm items found in the M3-Remainder Area-PR appear to have been fired into this area, and presumably they functioned (i.e., exploded) as intended. When items are shot into an area, then that area is by definition an impact area.
- ADEM understands that this munition has a high dud rate, therefore it appears that there should be reasonable expectation that other 75 mm shrapnel rounds (possibly along with other munition/MEC types) could exist as UXO in the M3-Remainder Area-PR sector.
- ADEM is also concerned that 40-mm HE round was found on the western fringe of the M3-Remainder Area-PR, and “remnants” of a 60 mm mortar round were also found in this sector (see comment 15).

The Army identifies these expended 75mm shrapnel projectiles found in the M3-Remainder Area-PR as “OE scrap”. “OE scrap” is defined (page 3-14 lines 7-9) as “parts of previous OE or OE related items that functioned as designed that are not OE or UXO, or that could not be positively identified”. ADEM is aware that within the past year, the DoD has changed some of the definitions relating to MEC related items. The expended 75 mm shrapnel projectiles may be categorized as “munitions debris” by today’s standards. Despite new definitions, at the time this data was collected, the Army considered the expended 75 mm rounds and other type of munition debris items as “OE scrap”.

The “OE scrap” designation apparently implies that there is no compelling reason for the Army to do additional investigation of the surrounding area. Perhaps this is why, even when two expended 75mm shrapnel projectiles were found in transect T03, Fort McClellan did not initiate further investigation of the surrounding area. It would appear that these items, though expended, should be identified as, for example, “OE frag” instead of “OE scrap”, and therefore should have triggered a grid or star pattern around the suspicious objects to see whether or not the find was anomalous. In addition to the 75 mm shrapnel rounds, the following items were also found in the area, and were considered “OE scrap” instead of other “munitions debris”: fuzes and fuze pieces, 37 mm armor piercing projectiles, and fragmentation. Additionally, a 40 mm high explosive (HE) round was found on the border of the NFA area and the Eastern Bypass.

It would appear reasonable to anticipate that unexploded 75 mm shrapnel rounds (UXO) could be located in areas where the expended 75 mm shrapnel rounds were found. It should also be considered possible that other UXO items could be located near the area where the 40 mm HE round was found. To best support the Army’s “No Further Action” recommendation, these expended items should have triggered further investigation of the surrounding area to demonstrate that the items were anomalous. However, the Army elected at the time to not do an expanded investigation around these items. Therefore, due to the finding of these expended rounds and other items of concern, and the subsequent lack of expanded characterization of those areas, the Department does not agree that the potential risks to human health due to OE have been adequately addressed for the M3-Remainder Area-PR. The fact that five (5) 75 mm shrapnel rounds, a 40 mm HE round, numerous other “OE scrap” items, along with possibly 60 mm frag (see comment 15) were found in the M3-Remainder Area-PR, it appears there is sufficient data to indicate further investigation remains warranted before an appropriate remedial alternative can be chosen.

Please include updated language regarding OE/UXO/MEC into the document, and indicate where additional investigation may be required due to the possible presence of unexploded ordnance.

Army Response: In the work plan addendum for the supplemental transects, ADEM and the Army agreed that discovery of a piece of fragmentation from a high explosive ordnance item would trigger a star search pattern around it. Discovery of a UXO item would trigger investigation of a 50 foot square grid to determine if the UXO item was a single anomaly or part of a larger impact area. After completion of the star pattern or grid search, the team would dig the next 40 anomalies before reducing the number of digs to the previously agreed level.

The 75mm shrapnel items discovered in the mountain transects T03, T08, T10, and T12 in 2001-02 were not subject to the requirements of the 2004 work plan addendum. However, it is important to note that if the 2004 requirements had been in effect in 2001-02, the characterization of these 75mm shrapnel rounds would have been no different than what occurred at the time. This is because 75 mm shrapnel rounds are not high explosive (HE); therefore, finding parts of shrapnel rounds would not have triggered a star pattern search. Also, no UXO 75 mm shrapnel rounds were found so setting up grids was not necessary.

The intended destructive effect from an HE round came from the action of the HE charge coupled with the fragmentation of the projectile casing, producing true fragmentation or frag. High explosive rounds were generally intended to destroy buildings and guns, not people and animals. The destructive effect of the 75mm shrapnel projectile came from the shrapnel balls and not the casing, which acted a carrier for the balls and was not designed to fracture or fragment. Parts of 75mm shrapnel projectiles are not fragmentation or frag, in the true sense of the word. Because expended shells indicate that the round functioned as designed the most appropriate designation under the terms used at the time this investigation was performed is OE Scrap. Under the revised terminology, these items would be identified as munitions debris.

There were 75mm shrapnel projectile UXO items found in other Bravo area risk sectors but no UXO of any type was found in the NFA area. Characterization of the M3-1L Suspect Area 1-PR that adjoins the northeast side of the NFA area identified five UXO 75-mm shrapnel projectiles and several 75mm OE scrap items (contained no explosive charge). In mountain transects T10 and T12, located in the part of the NFA area that is closest to M3-1L Suspect Area 1-PR, TtFW found one expended 75mm Shrapnel Projectile in each transect. They did not find any other 75mm OE scrap in any of the other transects placed in the NFA area near the border of the M3-1L Suspect Area 1-PR. Those transects are mountain transects T09, 10, 11, 17, and 19 and supplemental transects T 42, 43, 44, 45, 46, 47, 48, 50, 52, 54, 56, and 57. In the February 2004 meeting, the ADEM representatives required extensive additional characterization in this area. This additional characterization confirmed there was no UXO or OE 75mm shrapnel items or any other type UXO/OE.

Regarding a potential for unexploded 75 mm rounds to be present, the 75mm round generally functioned as intended under normal circumstances, i.e., where the soils are harder or where there is not a lot of snow or silt. They are not considered to be highly unreliable. Under controlled testing of projectile function the dud rate for 75mm rounds was 5.7 %, for all projectiles 3.45%, and the range was 0-11.7%. The low order rate for the 75mm was 0.2 %, for all projectiles 0.28%, and the range was 0-1.25%. These figures show they are within the normal reliability range for operating as intended. A list of the 75mm OE and UXO items found on FTMC to date is at Attachment 2.

The 40 mm round was found on the side of a road in Grid C85 of the Eastern Bypass. This 40mm round was a single item. At the February 2004 meeting, ADEM and the Army agreed it would be sufficient to investigate a 50x50 grid around the item with the location of the round as the center of the western border of the grid. No OE or OE scrap was found in the grid. This 50x50 grid was not shown on the map and will be added. While performing the clearance to depth in the Eastern Bypass no OE or OE scrap was found within 200 feet north, west, and south of the 40mm item.

The EE/CA report included a reference to 60mm mortar remnants in the recommendations section for M3-Remainder Area-PR. However, these items were found in the M3-2H-Mortar Area-PR during a site visit by the St. Louis District Corps of Engineers for the Archives Search Report. The EE/CA report will be corrected. Please see the response to Comment # 15.

The comment also expressed concerns about other findings in the NFA area such as fuzes and fuze pieces and 37mm armor piercing projectiles. In the February 2004 meeting ADEM representatives positioned the supplemental transects to address the potential for finding OE and UXO. The following lists these other findings with their location and the supplemental transects (numbered T26 – T65) that were placed in the area of the finding.

Findings In EE/CA Investigation	Identified in	Transects For Further Investigation
APT OE Scrap	Grid 549	None
APT OE Scrap	Grid 556	T51 and T60
APT OE Scrap	MT01	T30, T31, T33
APC OE Scrap	Transect M31m020	T63
APC OE Scrap	Transect M31m027	T32
APC OE Scrap	Transect M31m036	None (Grid 564 near)
APC OE Scrap	Transect M31m037	T29 and T32
APC OE Scrap	Transect M31m042	T28 (many transects nearby)
Fuzes and Fuze Pieces	Transect M31m043	T28
Fuzes and Fuze Pieces	T04 and T06	T33 and T34
Fuzes and Fuze Pieces	T21	T60, T61, and T62
Fragmentation	T10	T40, T41, and T57

In response to the statement that area is by definition an impact area when items are shot into it, this is not necessarily the case. An impact area is part of a live ordnance firing range. Findings include a high poundage/acre of HE items and/or HE fragmentation.

Having discussed the technical aspects of the 75mm shrapnel projectiles, the ordnance items found, the issues of OE scrap versus OE frag, the final issue is whether the data is sufficient to select a remedial alternative or whether further investigation is warranted. The Army believes the characterization is sufficient to support a NFA alternative in the M3-Remainder Area-PR and that the area can be released for significant public usage. Please see responses regarding target density in comments #1 and 4.

It is not advisable to change the terminology at this point in the process because all field logs and field notes used the former terminology. The memorandum dated April 21, 2005, for new Munitions Response Terminology will be added to the EE/CA and is provided as Attachment 3 to these responses.

4. Page 3-4 Lines 4-11:

- a. Provide and explain calculations on the minimum amount of acreage required to be sampled via grids and transects in the M3-Remainder Area-PR, provided no OE items are found during the sampling effort.

Army Response: The tool used to calculate the minimum amount of acreage required to be sampled in an Area of Investigation (AOI) for Fort McClellan was UXO Calculator. This tool has been superseded by UXO Estimator, which yields almost identical results and is based on the same theoretical development as UXO Calculator. UXO Calculator was developed by Dr. Bruce Barrett of the University of Alabama, Tuscaloosa. It was intended to be applied to UXO field sampling but can actually be used to characterize the occurrence of any discrete items. The procedure for generating a sampling size for an AOI is closely akin to acceptance sampling plans in use by the Government and industry for over sixty years (e.g., MIL-STD-1916). Basically, UXO Calculator and these acceptance sampling plans calculate a minimum amount of sampling required to meet certain criteria, including target values and confidence levels. They work like polling voters, in the sense that they require relatively small samples over a large population area to reach conclusions about the population at a high degree of confidence in the statistical predictions (typically 90-95%). UXO Calculator is therefore an acceptance sampling plan tailored specifically to UXO applications. In an AOI, UXO items are either present at some location or not, so their occurrence follows a binomial statistical distribution. By sampling this area, the number of UXO found will be either 0, 1, 2, etc. A characterizing statistical distribution may then be developed to extrapolate the sample information to the entire AOI. Dr. Barrett showed that this distribution was the negative binomial for this particular application, closely associated with the standard binomial mentioned above. By applying this distribution to the problem of field sampling, one may determine the appropriate sample size to employ with the assumption of finding either 0, 1, 2, etc., UXO in the AOI. However, to do this it is necessary to sample to a chosen target value, in order to determine when sampling is adequate to draw a conclusion at a certain confidence level (such as 90% as used at Fort McClellan). The target values recommended are 0.1 UXO/acre for areas of significant public use, 0.5 UXO/acre for moderate use, and 1.0 UXO/acre for minor use. These are normally agreed upon prior to sampling so that reasonable sample sizes may be generated for site characterization. The minimum sample size required is generated for the assumption that no UXO will be found. This serves to initiate a field sampling plan. If UXO are actually discovered, the plan should be modified to require further sampling to reach the same degree of confidence in the results. UXO Estimator (the second generation sampling tool) has a module that provides this information. In conclusion, an example from Bravo Area is illustrated. UXO Estimator is used to provide the calculations, although the results are comparable to UXO Calculator, the original tool used. In the M3-Remainder Area-PR, there are 1,112 acres. A target value of 1.0 UXO/acre was originally chosen, but due to more than adequate sampling, it was modified to 0.1 UXO/acre (this target requires the greatest degree of sampling of the three target values). For a 90% confidence level, UXO Estimator yields a sample size of 22.589 acres. In actuality, 28.5 acres were investigated with no UXO found. This provides a higher degree of confidence than the 90% assumed (specifically 94.57%). The interpretation is as follows: By sampling 28.5 acres of a 1,112 acre AOI and finding no UXO, we can be 94.57% confident there are no more than 0.1 UXO/acre in the entire AOI (i.e., one UXO in 10 acres on average).

- b. Explain how much acreage, if different than the minimum, was actually sampled in the M3-Remainder Area-PR.

Army Response: See above response.

- c. Explain how OE related items, such as expended 75mm shrapnel projectiles and a 40 mm HE round (found on the border of the Eastern Bypass and M3-Remainder Area-PR), should affect the minimum acreage to be sampled to verify that this area's target density value of 1.0 OE/acre (Passive Recreation) has been met.

Army Response: Since the 40mm HE round was found outside the M3-Remainder Area-PR (the AOI), it would not affect the results in this area. However, as an example, if one UXO item was found during sampling within the AOI, and 1.0 UXO/acre was the target value, 28.5 acres is still adequate to be more than 95% confident there is no more than 1.0 UXO/acre in the AOI. This is also true if 2 UXO were found in the sample. Also see response to Comment 4e below.

- d. Explain how much additional sampling effort would be required to validate a target density value of 0.1 OE/acre (Residential), if no OE items were found, since the JPA apparently has the area slated for residential land use.

Army Response: No additional sampling is required. See Table provided in the response to comment #1 and response to comment 4.a.

- e. Explain why no further action for UXO is justified in the areas associated with expended 75 mm shrapnel projectiles and other munitions debris, due to the probable presence of unexploded 75 mm shrapnel projectiles in the area.

Army Response: There has never been any statistical correlation that would indicate the presence of UXO items based on the discovery of OE scrap or expended items. Unless UXO were actually found during sampling, there would be no statistical basis for concluding that UXO were present.

Based upon documentation in the ASR, characterization in the EE/CA, and clearance in the 22 acres of Eastern Bypass Tract 3 that divided the M3-Remainder Area-PR, the NFA area does not present unacceptable explosive hazard risk for significant public use. No UXO was found in M3-Remainder Area-PR during the geophysical mapping of 40 acres and intrusive investigations of 28.5 acres.

In Sector M3-1L Suspect Area 2-PR, a 9-acre area located inside the M3-Remainder Area-PR sector, one UXO item was found. The recommended alternative for this area is Clearance to 1 Foot and a deed restriction prohibiting digging without construction support.

5. Page 3-7 lines 2-3 and page 3-11 lines 2-4: Based on the map, it appears that the mountain transects evaluated during the original investigation (2001-2002) were mainly located and completed in the M3-Remainder Area-PR. The Army states on page 3-7 lines 2-3 that: "anomaly counts were based on field crews manually recording the number of audible signals heard in pre-designated segments of each transect". On page 3-11 line 2-4, the Army states that "one anomaly was excavated every 290 feet along the 7.5 miles of mountain transects in the Bravo Area. This represents 10 digs per acre of transect area covered, at a transect width of 15 feet." ADEM understands that each mountain transect was divided into a number of 290 foot segments for investigation purposes, and that the Army used Schondstedt and/or White's magnetometers to perform the investigation.

- a. Clarify the meaning of the statement: "...crew's manual recording of audible signals heard in pre-designated segments of each transect". Explain how many "pre-designated segments of each transect" were investigated in each mountain transect. Does the Army mean that the number of audible signals were counted in some, but not all of the segments of each mountain transect?

Army Response: The wording in the EE/CA will be changed to “Anomaly counts were based on field crews manually recording the number of audible signals heard in all segments of each transect”. Audible signals were counted in each segment of each of the 24 mountain transects. The word “pre-designated” meant that prior to the start of the fieldwork, each transect was divided into segments and assigned a letter of the alphabet.

- b. The report does not seem to contain any of the anomaly count data that were reportedly collected. Please include this data in the report.

Army Response: A table of all of the audible signals recorded in the Mountain Transects is provided at Attachment 4. This table will be included in Appendix E with the intrusive results.

- c. The Department interprets this information to mean that some, but not all of the segments in each mountain transect were geophysically investigated using audible signals from hand held instruments. The operators reportedly manually recorded the number of anomalies they came across (data which was not provided in the report). For these segments, ADEM understands that only one anomaly every 290 feet was intrusively investigated. For the other segments, it appears that no geophysical investigation was completed and that Army representatives could have merely walked 290 feet along a predetermined path and then dug a hole to investigate what was there. Because the transects are 15 feet wide, ADEM would expect that the Army dug an exploratory trench every 290 feet, but this is unclear. Please clarify this issue in the text.

Army Response: Information clarifying the work performed in the mountain transects will be added to the EE/CA. The Mountain Transect investigations were conducted by three-person crews. The Crews consisted of a UXO Technician III and two UXO Technicians II. One team member was responsible for the hand held locator; while the other two team members took notes, assisted with the visual inspection, and dug identified targets. The crews walked along every segment of every mountain transect and counted the number of audible signals detected with the White’s metal detector. As described in section 6.6.3.2.6 of the Bravo Area Site Specific Work Plan (April 2001), the crews detected OE using a visual survey of the 15-foot wide swath and used the magnetometer to detect OE in the center 3 to 4 foot part of the swath. The team dug one audible anomaly in each 290 foot segment. There were no audible signals in some segments. In the event that a segment did not have an audible, the crew would increase the number of digs in the next segment. The surface findings and results of all digs are in Appendix E. The table provided in Attachment 4 shows the number of audible signals heard in each 290 foot mountain transect segment.

- d. Excavating one anomaly excavated every 290 feet appears insufficient and will not provide a statistically robust outcome of investigation. Furthermore, if one anomaly every 290 feet was all that was required to be investigated, then it appears that there are simply 289 feet in between this span of limited value data.
 - 1. Please clarify the basis of using 15 foot wide transects if only one anomaly every 290 feet was targeted for excavation.

Army Response: As described in section 6.6.3.2.6 of the Bravo Area Site Specific Work Plan (April 2001), the crews detected OE using a visual survey of the 15-foot wide swath and used the magnetometer to detect OE in the center 3 to 4 foot part of the swath. The 15-foot width was selected so that the operator could reasonably perform a visual examination of about 6 feet to either side of the 3-4 foot path where the magnetometer was used.

2. Please clarify the basis of the 290 foot discrimination interval and explain what was done by the investigative teams in between the 290 foot intervals.

Army Response: Excavating 1 anomaly per 290' equates to 10 anomalies per acre. This number of excavations was selected because that was what the team expected in the low probability areas. The investigation teams also kept track of the number of audibles along each transect. Information describing the methods used may be found in the Bravo Area SSWP (April 2001). Besides the excavation results, additional information was gathered by the investigation teams, such as surface items or evidence of impact craters. This information along with the excavation results presents a clear picture of the presence of ordnance in the sectors.

e. The use of White's or Schonstedt hand held instruments for geophysical data collection is of limited value because there is no comprehensive digital record of geophysical findings. Since no geophysical record is generated, there apparently is nothing that could have been used to justify the identification of a suspect anomaly for excavation. Special provisions are warranted to provide adequate quality control for this type of geophysical survey. There should be pictures, maps, drawings, coordinates, dig sheets, etc. The Department is unclear as to what QA/QC procedures were carried out to ensure the adequacy/effectiveness of this method of data collection. It appears that no QA/QC information is contained in the report.

1. Please clarify how the contractor and the Army performed QA/QC activities in the mountain transects.
2. Please explain if there are any records that verify the information collected in the mountain transects.
3. Include QA/QC data in the report.

Army Response: Intrusive data validation in the mountain transects was performed by the team leader who ensured the item dug was appropriate to the signal detected. Also, he verified that the identification of items was correct. Quality Control consisted of process QC, i.e., personnel were trained under the direction of a senior geophysicist in the proper use of the equipment and operation. Each operator was well trained on the use of hand held instruments prior to going into the field.

The General Site-Wide Work Plan for OE Response, September 2000, Section 11 required daily testing of equipment. Instrument sensitivity was tested each day of use in the equipment test plot located at the back gate of building 215. Preparatory, initial and follow-up inspections were conducted on each definable task. Field logs, photos, etc., of the work performed in these transects may be found on the 81 CDs provided to ADEM on January 24, 2003 (ADEM acknowledged receipt of the information by letter dated February 7, 2003).

For the mountain transects, the Corps performed QA of the process for the mountain transects. The Corps Safety Specialist observed the dig teams to ensure they followed transects and adhered to mag procedures.

f. Clarify in the text that the mountain transects discussed in these sentences do not include the supplemental transects added by the *Final Addendum to the Final Site Specific Work Plan Bravo Area EE/CA* dated June 4, 2004, which covers transects T-24 through T-65.

Army Response: The text will be revised to differentiate work performed in the mountain and supplemental transects. The tables included in Attachments 1 and 4 will be included in Appendix E.

6. The EE/CA report states that in the mountain transects (2001-2002), data were acquired using White's metal detectors. "Anomaly counts were based on the crew's manual recording of audible signals heard in pre-designated segments of each transect" [Page 3-7 line 1-3]. Data from a White's metal detector and Schonstedt magnetometer are not reproducible via maps, data processing, etc. The data are based solely on the operator and crew's experience and interpretation of audible signals. Without validated field work and appropriate thoroughness of the QC/QA effort, an instrument aided surface investigation may be of little value.

- a. Was each operator tested in the geophysical prove-out (GPO)? If so, please state how this effort was completed and provide records of the prove-out and QC/QA work performed in the report.
- b. Please detail how often equipment and personnel were tested in the GPO.

Army Response: There is no GPO for hand held instruments. The General Site-Wide Work Plan section 11 required daily testing of equipment. Instrument sensitivity was tested each day of use in the equipment test plot located at the back gate of building 215. Quality Control consisted of process QC, i.e., personnel were trained under the direction of a senior geophysicist in the proper use of the equipment and operation. Each operator was well trained on the use of hand held instruments prior to going into the field. Preparatory, initial and follow-up inspections were conducted on each definable task. The Schonstedt detector used in the supplemental transects has been shown capable of detecting common MEC items found on FTMC to depth.

7. Page 3-11 lines 1-4: The text states "Additional intrusive activities were performed in each of the 23 mountain transects in the Bravo Area. One anomaly was investigated every 290 feet along the 7.5 miles of mountain transects walked. This represents 10 digs per acre of transect area covered, at a transect width of 15 feet." There are more than 23 mountain transects in the Bravo Area. Please clarify in which mountain transects Fort McClellan conducted intrusive activities. Include the transect numbers in the text.

Army Response: ADEM is correct. There are 24 mountain transects and intrusive activities were performed in all 24 transects. The text will be corrected and revised to:

3.3.3.8 Additional Sampling

Additional sampling was conducted in Sector M3-Remainder Area-PR in July 2004. This additional sampling was conducted as an addendum to the existing task order. The objective of the addendum was to collect additional data to assist the ADEM in their assessment of the selected risk reduction alternative proposed for the area in question. ADEM and the Army positioned supplemental transects in the mountain area of Bravo at a meeting in February 2004. The following table indicates the thought process for placement of the supplemental transects.

Findings In EE/CA Investigation	Identified in	Transects For Further Investigation
APT OE Scrap	Grid 549	None
APT OE Scrap	Grid 556	T51 and T60
APT OE Scrap	MT01	T30, T31, T33
APC OE Scrap	Transect M31m020	T63
APC OE Scrap	Transect M31m027	T32
APC OE Scrap	Transect M31m036	None (Grid 564 near)
APC OE Scrap	Transect M31m037	T29 and T32
APC OE Scrap	Transect M31m042	T28 (many transects nearby)
Fuzes and Fuze Pieces	Transect M31m043	T28
Fuzes and Fuze Pieces	T04 and T06	T33 and T34
Fuzes and Fuze Pieces	T21	T60, T61, and T62
Fragmentation	T10	T40, T41, and T57

An addendum the Bravo Site Specific Work Plan was submitted to ADEM and approved. Forty supplemental transects were investigated. The supplemental transects were five feet wide and each segment was 290 feet long. The total investigated transect length was 12.31 miles. A Schondstedt hand held locator was used to perform the intrusive investigation and all anomalies were investigated. The supplemental transects were number T25 through T65. Only OE or OE scrap was logged in the hand held instruments. Four transects (T30, T31, T44, and T63) contained OE Scrap items, for a total of 6 items. Three items were found on the surface, two items were found at 2 inches, and one item was found at 3 inches. The results are included in Table 3-1.

8. Page 3-11 line 29 Additional Sampling: Additional sampling was performed in July 2004 to supplement the data previously collected in the M3-Remainder Area-PR.

- a. There is no apparent way to distinguish the 15 foot wide original mountain transects (2001-2002) from the supplemental transects (2004), which were reportedly 5 feet wide. Please distinguish these on the map titled “Bravo Area EE/CA Overview” and in the text.

Army Response: To distinguish between the original transects and the additional sampling transects a note will be added to the legend of the Overview map stating: Transects T01 through T24 were investigated in 2002 and are 15 feet in width. Transects T25 through T65 were investigated in 2004 and are 5 feet in width. The title of Section 3.3.3.8 at line 29 will be revised to “Sampling in the Supplemental Transects” and the word “supplemental” will be inserted everywhere it applies to these transects.

- b. In addition to the OE scrap items found, please also include the total number of anomalies dug for each supplemental transect in the text.

Army Response: The table titled “Anomalies (Digs) in Supplemental Transects” provided in the response to general comment #2 shows the total number of anomalies dug for each supplemental transect. According to the work plan, crews would dig all anomalies up to 40 anomalies per 290’ segment. As it turned out, no segment had more than 40 anomalies. This table will be included at Appendix E.

- c. Appendixes E “Table of All Findings” only contains data for mountain transect T-01 through T-24 (BMT01 - BMT24). Include in the table the data for the supplemental transects, numbered T-25 through T-65.

Army Response: Information for the supplemental transects T25 through T65 will be added to Appendix E.

- d. There appears to be no QC/QA data for the supplemental transects. Please clarify how the contractor and the Army performed QA/QC activities in the supplemental transects, and include this information in the document.

Army Response: Quality Control consisted of process QC, i.e., personnel were trained under the direction of a senior geophysicist in the proper use of the equipment and operation. Each operator was well trained on the use of hand held instruments prior to going into the field. Preparatory, initial, and follow-up inspections were conducted on each definable task. Each day the instrument sensitivity was tested in the equipment test plot located at the back gate of building 215. The General Site-Wide

Work Plan section 11 required daily testing of equipment. The Schonstedt detector used in the supplemental transects has been shown capable of detecting common MEC items found on FTMC to depth. The Army completed the additional sampling in compliance with the Final Addendum to the Final Site Specific Work Plan - Bravo Area EE/CA Ordnance and Explosives Response developed in conjunction with the ADEM representatives.

The Quality Assurance Process for the supplemental transects is described in the Quality Assurance Surveillance Plan (QASP) dated May 19, 2004. The plan is at Attachment 8 and was provided to Mr. Philip Stroud by E-mail on May 21, 2004. The Corps Safety Specialist observed the dig teams to ensure they followed transects and adhered to mag procedures.

- e. The Army stated in its June 4, 2004 Final Addendum to the Bravo EE/CA Work Plan that no brush clearing was performed for the supplemental transects (T-24 through T-65). However, this seems impractical considering the thickness of brush during the summertime at Fort McClellan, and the fact that the survey was done using hand held instruments, and only audible signals were used to locate anomalies. Please explain how the data collected in these supplemental transects is verifiable and accurate.

Army Response: The work plan addendum stated that no brush clearing would be required. Brush clearing was performed only to the extent determined necessary by the field crews. The Schonstedt was used because it could be inserted under bushes to pick up anomalies.

9. Based on Fort McClellan's explanation, it appears that the data are questionable in the mountain transects. As a result, any conclusions drawn by the Army regarding the M3-Remainder Area-PR using these data also appear questionable. Please clarify how the Army conducted its mountain transect and supplemental transect work and justify the validity of the data collected. If the data and conclusions are not supportable, please state so and describe the additional work the Army plans to undertake to resolve this matter.

Army Response: The information provided in the Army's responses to these comments should serve to clarify how work was conducted in the mountain and supplemental transects. The revised section on geophysical procedures at Attachment 5 may clarify some issues.

The data collected in 7.5 miles of mountain transects is validated by the additional data collected in 12.31 miles of supplemental transects. This additional work fulfills the agreement reached between the Army and ADEM in meetings held in February 2004. The purpose of the meetings was to develop a path forward to resolve ADEM concerns about data in the M3-Remainder Area-PR characterization so that ADEM would have sufficient information to evaluate the Army recommendation of NFA. Discussions and decisions reached between the Army and the ADEM representatives Spencer Nelson and Mac Reed included the method of investigation (hand held instruments), quantity of sampling, and location of supplemental sampling areas. The Army completed the additional sampling in compliance with the Final Addendum to the Final Site Specific Work Plan - Bravo Area EE/CA Ordnance and Explosives Response developed in conjunction with the ADEM representatives. No OE or UXO was found at any time throughout the entire range of sampling in the NFA area. Intrusive investigation of 28.5 acres in the 1112 acre NFA area provides sufficient data to state with 90% confidence that a target density of not more than 0.1 OE item/acre was met.

10. Page 3-6 line 38-39: Digital geophysical data were reportedly collected in 209 grids and in 147 data collection transects. However, (page 3-7 line 35) the intrusive investigation for the data collection transects were based on flagged locations rather than processed digital geophysical data.
- a. If geophysical data were collected in the data collection transects but not processed, then please clarify why the geophysical data were collected and how the digital geophysical data were used.
 - b. In the transects where digital geophysical data were collected by the Army, were the data compared to the corresponding anomalies marked by the EM-61 operator's interpretation of the audible signals?
 - c. Making an interpretation of which anomalies to investigate based on an audible signal appears subjective and potentially inaccurate. Individual EM-61 operators have various skill levels and hearing capabilities, leading to variations in the quality of reported findings from one person to the next. How did the EM-61 operator determine the proper audible level necessary to demark an anomaly for intrusive investigation? What level of effort did the Army take to ensure the validity of the work completed?
 - d. Again, no QC/QA data is evident in the report. Please include this data.

Army Response a-c: The section on Geophysical Data has been revised to address these and other concerns and is included at Attachment 5. This revision will appear in the next version of the EE/CA. To summarize, geophysical data were collected for 145 data collection transects (clusters); and audible anomalies emitted by the EM61 were flagged in the field as they were encountered. For 103 of the clusters, a geophysicist interpreted the data, selected anomalies for reacquisition, and formulated dig sheets. The flags in the 103 clusters were used only to enable field crews to more quickly locate the selected anomalies. Nineteen of the mapped clusters were not processed further as is explained in the revised section 3.3.3.3. In 23 clusters, crews used the flagged locations of anomalies to perform the intrusive investigation of the anomalies. The acquisition personnel were trained in the field by a senior geophysicist, and the EM61 electronics were nulled in the field as per the pre-task training effort. The nulling procedure involved turning the volume all the way up and then nulling the bottom coil until the instrument "hum" could not be heard by the instrument operator, and then slowly turning the nulling dial "up" until the "hum" of the instrument was just audible. This procedure helped ensure a level of consistency between the different teams.

Army Response d: Quality Control consisted of process QC. That is, personnel were trained in the proper use of the equipment and operation. Preparatory, initial, and follow-up inspections were conducted on each definable task. For Quality Assurance, the U.S. Army COE Safety Specialist observed the dig teams to ensure they followed transects and adhered to mag procedures.

11. Page 1-2 line 45: Three Eastern Bypass Removal Action grids adjacent to the Bravo Area (including R54, R51, and R48) contained OE items. The Army established a 200 foot buffer zone encompassing these OE finds, which extended into the M3-Remainder Area-PR. The boundary of the M3-1H Mixed Use Area-D (clearance to depth) was extended southward along the border of the Eastern Bypass right of way to include the 200 foot buffer zone where these OE items were found.

Additionally, grid C85 of the Eastern Bypass (EBP) Removal Project contained a 40 mm HE projectile (page 1-2 line 45). In the June 4, 2004 response to ADEM Review Comments on the *Draft Final Addendum to the Final Site Specific Work Plan Bravo Area EE/CA Ordnance and Explosives Response*, comment 4, part of the Army's response was "The 40 mm HE round in grid C85 will be treated as if it were found in the NFA area. A grid as described in the work plan will be investigated in this location". There is a grid (No. 171) located between the border of the Eastern Bypass and Yahoo Lake. However, it is unclear from the work plan or the Bravo EE/CA report if Grid 171 was the aforementioned proposed grid, and the reasons why this location was chosen for the grid.

Furthermore, it appears from the Bravo Area EE/CA Overview map that grid 171 was actually a half-grid, and very little other investigation is evident in the area near the 40 mm round find. Please clarify why the grid was not placed as close as possible to the 40 mm round find, and why the 40 mm HE round was not treated like the items found in R54, R51, and R48.

The area around grid C85 of the EBP removal project should be treated the same as other grids adjacent to grids containing OE items. Thus, a 200 foot buffer should be extended into the M3-Remainder Area-PR and the area should be cleared to depth. Any other OE finds during this removal action should trigger the creation of another 200' buffer zone until no more OE items are found.

Army Response: Grid 171 is not the grid that was investigated in response to finding the 40mm item. The grid that was investigated as a result of the 40mm item was not shown on the map and will be added. Following the February 2004 meeting, the ADEM representatives agreed the Army could investigate a 50x50 foot grid placed in the NFA area with the location of the 40mm item as the center of the western border of the grid. In the 50x50 foot grid, no OE anomalies were found; and two non-OE anomalies were found. The rationale for investigation of only a 50X50 foot grid into the Bravo area is that there was no OE or UXO found in a 200 foot area of the Bypass to the north, west, and south of Grid C85 during characterization of this area between December 2001 and March 2002. The attached file (Attachment 6) shows all items found in grid C85 and the 22 grids and partial grids in the Bypass within 200 feet of grid C85. The only OE item found in any of these grids was the 40mm grenade in C85. A total of 87 mapped anomalies were intrusively investigated in these grids including 10 that were selected as QC digs. These 87 anomalies were located in 10 grids. Fifteen grids were either partially or totally "mag & dig" due to terrain. There were no anomalies identified in three of the grids. A significant portion of the anomalies were associated with construction debris under Iron Mountain Road. Only 5 of the mapped anomalies were OE related and 4 of those anomalies were OE Scrap. One of the OE scrap items was identified as 60 mm Mortar, HE Fins. Two additional items are identified as "frag" (one Misc Frag and one Signal, Illum, frag). It is clear the term "frag" does not refer to HE Frag but instead is used as short hand for fragments. The usage of "fragmentation" represents a general description of OE Scrap as derived from the definition for OE Scrap previously used by the Department of Defense for classification of all OE debris which could not be classified as UXO, OE, or non-OE scrap.

It is also significant that a 40 mm HE projectile was found **at all**, in or immediately adjacent to a proposed NFA area. Please describe the significance of this finding identified quite some distance away from the location of a 40-mm training range in the Bravo area.

Army Response: There is no historical information to support the finding of a 40mm OE item in this location. It was found adjacent to a road, and there were no others found anywhere in the vicinity.

12. Page 3-19 line 41-43: The text states that no UXO items were found between the two parts of the M3-Remainder Area-PR in the Eastern Bypass Project. This is incorrect. See comment 11. Please correct the text.

Army Response: The area referred to is defined by extending the boundary of the western portion of the NFA area until it contacts the eastern portion at the same azimuth (where the northernmost grid is C23). In this area of the EBP, there were no UXO or OE located between the two parts of the NFA area. The R grids are well north of this area. Additionally, TtFW did not find any OE or UXO in the A2 area or in the part of the Bypass that splits the A2 area.

13. The Ordnance and Explosive Risk Impact Assessment (OERIA) (Chapter 4.5) was reportedly used in conjunction with the 1997 reuse plan (page 4-20 line 30). However, the validity of the 1997 reuse plan is in question (see comment 1).

Army Response: The Army continues to use the 1997 plan. Please see response to General Comment #1.

Exhibit 4-9, OERIA Table for Sector M3-Remainder Area-PR, classifies OE type for the M3-Remainder Area-PR as “Category 0”, meaning “Inert OE or scrap”. OE Type “Category 1” assignment rules include “all practice ordnance (fired or unfired)”, “Category 2” assignment rules include “all non-HE filled, non-practice items”, and “Category 3” includes “All high explosive (HE) filled items (fired or unfired)” (page 4-21, Table 4-4).

- a. Does “Category 0” definition mean “inert OE”, such as inert practice rounds, and “scrap” such as horseshoes and nails? Or does it mean “inert OE” such as inert practice rounds, and “OE scrap” such as expended OE or “munitions debris”? ADEM notes that throughout the report, the Army refers to all the expended OE items as “OE scrap”. Please explain the Army’s interpretation of this terminology. (See also comment 3.)

Army Response: Only OE items are categorized; non-OE scrap such as horseshoes and nails are not assigned a category. The title of Table 4-4 will be changed to “OE Categories with Descriptions”. Under OERIA guidance, the description column for Category 0 states “inert OE or scrap, will cause no injury”. The description column was used to interpret and assign category numbers to OE items that were identified. Identified OE items were not separated into live or practice groupings. Each OE item was evaluated based on the description column in the OERIA guidance and assigned a numerical status. Items that presented NO risk were assigned a Category 0. If an OE item, no matter whether practice or real, posed any residual risk it was assigned a Category 1 status at a minimum. If it was determined that there was no risk or the item was not functional, it was assigned a Category 0 status.

The definition of OE scrap on page 3-14 lines 7-9 will be changed to “parts of previous OE or OE related items that functioned as designed but do not contain an explosive hazard, or that could not be positively identified”. A definition for OE Scrap will be added to the section on Acronyms and Definitions in the EE/CA.

- b. It appears to ADEM that OE Type “Category 1” should be the minimal classification of the area due to the presence of expended 75 mm shrapnel projectiles, and it’s possible that Category 2 or 3 should be used considering the presence of the 40 mm HE round on the border of the M3-Remainder Area-PR and the Eastern Bypass.

Army Response: Category 0 was used as the classification of the area because no items with an explosive hazard, i.e., nothing that would cause injury, were found in the NFA area. The 75 mm shrapnel projectiles had no residual explosive hazard and were thus classified as OE scrap. Regarding the 40mm item, investigation of the additional grid as agreed between the Army and ADEM did not show any other 40mm item, OE item, or OE scrap item. There were no other findings of 40mm items within 200 feet to the north, west, and south of the 40mm item, and historical information did not indicate a reason for the 40mm item to be located here. These issues are discussed in responses to some of the previous comments. The Army believes Category 0 is the appropriate classification.

- c. In the OERIA Table for Sector M3-Remainder Area-PR, the “OE Sensitivity” category is listed as “Category 0” – “Inert OE or scrap, will cause no injury”. The Department argues that the expended OE items found in M3-Remainder Area-PR should be classified minimally as “Category 1” – “OE that may have functioned correctly or is unfuzed but has a residual risk”. The reason for this is that the expended 75 mm shrapnel projectiles may contain unburned energetics, as well as the fact that the 75 mm’s had high dud rates and unexploded 75 mm’s could possibly still be present.

Army Response: None of the expended 75mm shrapnel projectiles found in the NFA area contained unburned energetics. Please see the responses to general comments 3 and 4.e. regarding issues of high dud rates and potential for unexploded 75mm ordnance items.

- d. The Department recommends re-evaluation of the M3-Remainder Area-PR OERIA to appropriately reflect the results of sampling and to consider the correctly updated future land use. Update the results of the risk assessment and the report accordingly.

Army Response: The Army believes the M3-Remainder Area-PR was evaluated to the extent necessary to support a NFA recommendation. The Army also believes that the information provided herein and the responses to previous comments will convince ADEM of this. The updated future land use can be supported by the characterization that was performed. The EE/CA report will be revised as stated in the responses to comments. In addition to the responses, the attachments provide information that ADEM will find useful in evaluating the NFA response.

- e. The Department has expressed concern over the Army’s classification of expended 75 mm shrapnel projectiles as “OE Scrap” (see comment 3). The Department also notes the presence of a 40 mm HE round found on the border of the M3 Remainder Area-PR during the Eastern Bypass Project. Expended MEC related items have a tendency to be co-located with unexpended MEC related items. Thus, it does not seem appropriate in the OERIA table for Sector M3-Remainder Area-PR, to characterize the findings as Category 0, meaning inert OE or scrap.

Army Response: As stated in the response to comment 4.e., there has never been any statistical correlation that would indicate the presence of UXO items based on the discovery of OE scrap or expended items. Unless UXO were actually found during sampling, there would be no statistical basis for concluding that UXO were present. The findings in the NFA area were inert OE and OE scrap. There were no OE items (items containing an explosive hazard) found in the M3-Remainder Area-PR. Please see response to Comment 13.b.

14. The table at the bottom of the Conceptual Site Model for the M3-Remainder Area-PR (Page 4-33) says that OA# 01, Rocket Range, is located in M3-Remainder Area-PR. This range is much farther north and not contained within M3-Remainder Area-PR. The table also contains OA# 02, OA# 44, OA#55, OA# 48, and OA#50, which are in other areas, not the M3-Remainder Area-PR.

- a. Please explain why these several areas are included in the Conceptual Site Model for the M3-Remainder Area-PR.

Army Response: The risk assessor rechecked all of the above OA s. OA-1 should be removed from the CSM. For the remaining OAs, the safety fans cross into the risk sector; but Plate 10 of the Archives Search Report does not show these safety fans. OA-02's safety fan on Plate 5 is in this area, OA-44's safety fan on Plates 5-6 is in this area, OA-45's safety fan on Plates 6,7, and 10 is in this

area, OA-48's safety fan on Plate 7 (and maybe 6) is in this area, OA-50's safety fan on Plate 6 is in this area, and OA-55's safety fan on Plates 5 and 6 is in this area.

- b. The Conceptual Site Model does not include OA#45, Range 16. A good portion of this range is located in the northern portion of the proposed NFA area known as M3-Remainder Area-PR. Items that were found in Range 16 included rockets, small arms, and 40 mm grenades that ADEM understands are very sensitive. Please correct the Conceptual Site Model, update affected data throughout the text, and if affected, revise the boundary of the proposed NFA area accordingly.

Army Response: ADEM is correct. Part of OA-45 is in the NFA area. The revised CSM is included as Attachment 7 to this response. The addition of OA-45 does not change the outcome of the risk assessment because the Risk Assessors did not use OAs in the analysis. Originally these OA's were used to make the initial high, low, and medium boundaries when the sampling plan was developed. After characterization began, the characterization data was used to classify the risk sectors. The OA's are included on the CSM for historical information. The current boundaries are due to what was found in the characterization process and have already been adjusted. Investigation in the part of OA-45 that extends into the NFA area did not yield any items with an explosive hazard.

- c. The Department notes that no grids are contained in the portion of M3-Remainder Area-PR that falls inside the Range 16 safety fan. Furthermore, the transect coverage of this area appears to be low. In the original set of mountain transects, only one anomaly was investigated every 290 feet. As a result, this reduces the amount of useable data collected in this area. Range 16 has been shown to contain sensitive 40 mm HE grenades along with other MEC items. In addition to any other work that is done to determine if the M3-Remainder Area-PR is acceptable for NFA, the Department suggests that the Army investigate the Range 16 area more closely.

Army Response: The portion of M3-Remainder Area-PR within Range 16 that does not have investigation grids has difficult terrain. It was determined that this area was too steep for the grid method. Therefore, transects were the selected method of investigation. In the meeting on February 6, 2004, ADEM marked the areas where they wanted additional sampling to support a NFA. The additional sampling locations were chosen to verify that previous work adequately characterized the NFA area. In this particular part of the NFA area, ADEM marked supplemental transects T33, T40, T41, and T57. The crews investigated every foot of these transects and did not find any anomalies in T33, T40, and T41. In T57, two anomalies were identified as Non OE Scrap. Based on the additional information provided in the responses to these comments, the Army hopes the Department will agree that sufficient data has been collected.

15. Page 9-9 line 37: The Army makes the following statement regarding the 60 mm Mortar Range (OA-53): "During a site visit, remnants of 60 mm HE mortar rounds were identified on the surface." ADEM notes that this statement was included in a section of the text referring to the M3-Remainder Area-PR, a proposed "No Further Action" Area.

- a. The word "remnants" is unclear and is not an appropriate word when discussing MEC. Please describe and define the word "remnants". It would appear that this should be categorized as "HE frag". Please clarify this matter.
- b. The range fan for the 60 mm Mortar Range crosses several risk sectors in addition to the M3-Remainder Area-PR. These risk sectors include the M3-2H Mortar Area-PR, M3-2H Mortar Area-D, and M3-1L Rocket Area D, and M3-1H Rocket Area-PR. Because the subject sentence is in section 9.9.1 "Description and History" of the M3-Remainder Area-PR, then the Department

concludes that the frag from the 60 mm HE mortar rounds were found in the M3-Remainder Area-PR. Please clarify the locations where frag was found.

- c. Please identify any and all locations where frag was found in the text, including the locations of the identified 60 mm HE mortar frag. Ensure that this information is correct, consistent, and included in all risk assessments and decision making tools throughout the report.

Army Response a-b: The remnants were found in the M3-2H-Mortar Area-PR portion of the range fan for the 60mm mortar range. The information regarding 60mm mortar remnants is from the Archives Search Report (ASR, 2001) prepared by the St. Louis District Corps of Engineers who also performed the supporting site reconnaissance. The ASR description of the 60mm Mortar Range (OA-53) states "During the site visit, remnants of 60mm HE mortar rounds were found in Area 15." A 60mm Mortar tail fin section (remnant) that was seen is pictured in ASR Appendix I, page I-3. On May 11, 2005, Fort McClellan verified with the St. Louis District that the location of these remnants was at grid coordinates 10.3 and 28.2 on the Fort McClellan training map which places the remnants in the M3-2H-Mortar Area-PR where TtFW located other 60 mm mortar UXO items during the EE/CA characterization. TtFW did not locate 60mm OE items in the NFA area nor did they find any other OE or UXO in the area; they found only OE scrap, i.e., items that did not possess an explosive hazard. The statement regarding 60mm mortar remnants will be removed from discussion of the M3-Remainder Area-PR in Section 9.9.1.

Army Response c: The text for the M3-2H-Mortar Area-PR will be revised to include the ASR findings of "remnants of 60mm HE mortar rounds". Table 3.1 and Appendix E include locations where fragmentation was identified in the Bravo Area. The term "fragmentation" was not necessarily used to mean HE frag, which was generally identified as "HE frag". The usage of "fragmentation" represents a general description of OE Scrap as derived from the definition for OE Scrap previously used by the Department of Defense for classification of all OE debris which could not be classified as UXO, OE, or non-OE scrap. The OE Scrap category included all such "fragments" or residual pieces of ordnance items and/or training/practice items that could not be included under the other specific classifications. Fragmentation included such things as spent rocket motors, fins, nose cones, tail booms, and any other piece of broken ordnance that was identified as being part of an ordnance/training/practice item that could not be classified differently. OE Scrap does include fragments from high explosive (HE) detonations from HE rounds such as from live mortars, rocket warheads, artillery, etc.

16. Page 9-10 lines 19-21: The text identifies the types of OE scrap found in sector M3-Remainder Area-PR. The description of the OE scrap finds should focus on the most serious finds in the sector, not the most benign. Thus, the text should be modified to first describe that expended 75 mm shrapnel projectiles, 60 mm mortar frag (see comment 15), a 40 mm grenade, and numerous unidentified OE fragmentation pieces were found. Following this description, the Army should then describe that numerous "OE scrap" items were found as listed. Please revise the text as noted.

Army Response: Text will be modified to describe the expended 75 mm shrapnel projectiles first. The issue of the 40mm grenade will be added. Previous responses clarified there were no 60mm mortar OE items found in the NFA area.

17. The Department notes that Fort McClellan did not include any UXO investigation grids in the portion of M3-Remainder Area-PR that falls within the Range 16 range safety fan. Furthermore, the transect coverage of this area is also low.

In Fort McClellan's initial (2001-2002) UXO investigation of this area, the Army did establish investigational transects (T10, T04, and portions of T05 and T09) in this area. However, for those transects, Fort McClellan elected to limit its intrusive investigation to only one anomaly every 290 feet. As a result, there is very little useful data available to characterize or assess this area.

In 2004, supplemental transects were added to this area. According to the map, the M3-Remainder Area-PR portion of the Range 16 safety fan included portions of transects numbered T40, T41, T33, and T57. The transects were 5 feet wide and were investigated using hand held instruments, with limited or no brush clearance. All surface and subsurface anomalies, both MEC related and cultural debris (up to 40 anomalies per 290 foot segment), were to be investigated in this second phase of investigational transects. The Bravo Area EE/CA Overview map indicated that no metal was found in these transects. The Department must conclude that no digs were done in these transects.

Range 16 has been shown to contain highly sensitive 40 mm HE grenades along with other dangerous MEC items. Further assessment of the M3 Remainder Area-PR area within the Range 16 safety fan appears warranted to support that an NFA designation is warranted here. Please assess this area more closely.

Army Response: The purpose of the meetings between ADEM and the Army in February 2004 was to identify additional sampling that ADEM required to support a NFA determination. In the meeting on February 6, 2004, ADEM marked the areas where they wanted additional sampling to support a NFA. The additional sampling locations were chosen to verify that previous work adequately characterized the NFA area. In this particular part of the NFA area, ADEM marked supplemental transects T33, T40, T41, and T57. The crews investigated every foot of these transects and did not find any anomalies in T33, T40, and T41. In T57, two anomalies were identified as Non-OE Scrap. No 40 mm OE or OE scrap was located in the mountain or supplemental transects of the NFA area. While the "safety fan" of Range 16 may enter the NFA area, safety fans are at least 2 to 3 times the maximum travel distance of the items. The southern-most 40mm related items found were found in transect M32h004 located in Sector M3-2h Mortar Area-PR. It is listed as 40mm OE scrap fragmentation in the database.

The table provided in the response to comment #2 shows the number of anomalies that were detected and dug in the supplemental transects and the table in Attachment 1 shows the OE scrap findings in the supplemental transects. The Bravo Area Overview map will be corrected to show the appropriate findings in the supplemental transects. The response to Comment #2 provides information on the digs that were performed in the supplemental transects and information related to the Bravo Area EE/CA Overview map. Based on the additional information provided in the responses to these comments, the Army believes the Department will agree that sufficient data has been collected to support a NFA recommendation for M3-Remainder Area-PR sector.

18. Once any "NFA" areas are properly delineated and approved by ADEM, land use controls may still be warranted for certain areas. The Department requests that the language throughout the report (when referring to the remedial alternative for M3-Remainder Area-PR) be changed from "No Further Action" to "No Further MEC remedial action required with implementation of Land Use Controls". If the area is only to be used for Passive Recreation, this in itself is a Land Use Control. Other land uses (industrial, residential, etc.) will similarly require appropriate land use controls. The Land Use Controls to be considered for Passive Recreation properties should include but not necessarily be limited to the following:

- Construction worker MEC identification and safety training,
- Provisions for future land owners to notify the Army prior to any intrusive activities on the property
- Five year reviews
- Deed notice

Note that such LUCs would be subject to ADEM review and inspection on a regular basis.

Army Response: The recommended alternative for M3-Remainder Area-PR is No Further Action. The property would have the standard MEC deed notice for action to be taken in the event a suspect item is found. Responses to previous comments address the rationale for this recommendation.

19. The proposed Bravo NFA areas encompass 1043 acres. Only 2% of the area was investigated using grids and transects. Most of the transects were investigated using surface sweep or audible-based EM-61. This is problematic for several reasons.

- a. ADEM surmises that Fort McClellan was not aware of the historical nature of some of these areas. For example, ADEM understands that Fort McClellan was not aware until the initial (2001-2002) investigation that 75mm shrapnel projectiles were fired into this area. If that is the case, then there may be other unknown target areas that are yet to be identified.

Army Response: The ASR and Environmental Baseline Survey (EBS) were prepared from records searches and historical accounts of activity on the Fort. The information in the EBS and ASR provided baseline data from which the Army began its MEC investigations. The Army used the baseline data along with aerial photos, analysis of the topography, and field reconnaissance to better define areas of MEC contamination and to determine the characterization sectors for the EE/CAs. During the startup of the Bravo EE/CA, the Risk Assessment team conducted a site visit and records search at Fort McClellan and during document review noted a reference to 75mm shrapnel projectiles for this area. The additional work in the supplemental transects supports the Army's work of defining areas where 75mm shrapnel items would be found. No additional 75mm shrapnel items were found in the supplemental transects. The Army's process to define areas for characterization has been supported by additional MEC work in areas such as M1.01/M3 Miscellaneous Area, Eastern Bypass Tract 2, and the Bravo NFA area.

The response to comment #4 addresses calculation of the sampling size necessary to support a chosen target value, in this case 0.1 OE/acre for significant public usage.

- b. It is unclear how many items were identified by Fort McClellan using the Schondstedt, Whites or EM-61 instruments over the roughly 21 acres that were collectively investigated versus the number of items that were dug.

Army Response: For the grids, the digital geophysical data is located on the CDs provided to ADEM in 2003 and the number of items identified is in Appendix E. For the data collection transects (clusters), the digital geophysical data and digsheets for 103 of the clusters are also available on the CDs and the items identified are listed in Appendix E. Twenty-one of the clusters were investigated with an EM61 in "sweep mode" and the results are located in Appendix E. For the original mountain transects (T-1 through T-24), Appendix E provides a listing of the items dug and Attachment 4 of this response package shows the number of audible signals recorded. For the supplemental transects, the number of items dug (which is equal to the number of audibles recorded) is provided as Attachment 1. The scope of work for the supplemental transects required the contractor to record only the OE related items found; it did not require that non-OE scrap items be recorded.

- c. In the mountain transects, it is unclear from the report if each and every “ring-off” was acquired, as planned. If so, then there should be a significant amount of information to include in the report, such as log sheets and a summary of characterized findings. This information was not presented in the report, indicating that such information was likely not obtained to sufficiently characterize the NFA areas as requested.

Army Response: In the mountain transects, field crews acquired geophysical data using a White’s metal detector and manually recorded all audible signals heard. Due to the constraints of the extreme terrain in the mountains, no digital geophysical data was recorded in the mountain transects. The table of audible signals recorded in the mountain transects is provided as Attachment 4. The findings in the mountain transects are listed in Appendix E, pages E-50 through E-53. The log sheets were not included in the EE/CA report because it was not a requirement of the Data Item Description (DID) but are on the CDs provided to ADEM in 2003.

- d. As noted in ADEM’s earlier comments above, the geophysically investigated transects were intrusively investigated in a subjective manner, based on a technician’s interpretation of an audible signal, essentially leading the EM-61 survey to be reduced to an accuracy similar to the other “mag & dig” actions completed in the mountain transects.

Army Response: Please see response to Comment 10.

- e. The Army did not provide any data for the supplemental transects in the EE/CA report. The purpose of the additional transects was to present data that would support the NFA recommendation. The lack of such data and the lack of any QA/QC data related to those supplemental transects does not provide the Department with the information to move forward with the NFA recommendation.

Army Response: The response to comment #2 addresses the lack of data. Additional information is provided in responses to comments. Information on results of all digs in the supplemental transects was inadvertently omitted from Appendix E but will be added and is included as Attachment 1 of this comment/response package. The 6 OE scrap items found in the supplemental transects were listed in Table 3-1. The remaining 206 digs were non-OE scrap. The table provided in the response to Comment 2 contains the information on number of digs per segment.

The QASP (see Attachment 8 and response to comment #8) described QA procedures for the characterization of the supplemental transects.

- f. The entire report is lacking any reported QA/QC data of the various grids and transects investigated.

Army Response: Previous responses regarding QC and QA address this comment.

- g. In recent months, ADEM and the Army have identified a number of concerns regarding historical “mag and dig” operations. From ADEM’s perspective, it appears that surface investigation/clearance activities conducted by the Army using a magnetometer have been incomplete and have yielded inaccurate results. For example, the Army originally presented an NFA recommendation in the M1.01 area, which had been cleared using “mag and dig” operations. After much debate, the Army agreed to re-investigate six grids out of over 100 total grids in the M1.01 area. This re-investigation of the M1.01 area indicated that the original

investigation overlooked a significant number of UXO and MEC related items. The re-investigation was completed by the Army in early January 2005 and the official results have not yet been submitted to the Department.

Army Response: The Army submitted the Final Letter Report to ADEM in April 2005. No UXO was found in the six grids. There was a large amount of non-OE metallic scrap in the six grids which tended to make it difficult to locate all MEC related items during the mag and dig operation. Although the Army was disappointed that the MEC related items were not found in the earlier clearance operation, the items were like those that were found in the earlier mag and dig operations. The geophysical investigation and associated QC and QA did not turn up any UXO or other findings to refute the NFA recommendation for the M1.01/M3 Miscellaneous area.

In conclusion, it appears the Army has not provided adequate information in the report to support the NFA designation of the subject M3-Remainder Area-PR sector of the Bravo Area. The available data should be presented, including QA/QC data, in the report. After all relevant data is presented in a clear and concise manner, then it can be determined if the NFA area has been adequately characterized or if more investigation is needed.

Army Response: The Army agrees the information necessary to provide concurrence with a NFA recommendation for the M3-Remainder Area-PR was not included in the EE/CA report. The Army will revise the EE/CA report with information as provided in these responses to ADEM comments. The Army requests that ADEM use the additional information provided in these responses to reach its decision on the NFA areas.

Specific Comments

1. Chapter 4, Figures 4-2 through 2-18 (Pages 4-33 – 4-49): Under “Potential Receptors”, the boxes indicating the types of potential receptors (“resident”, “Com/Ind Worker”, “Construction Worker, etc.) are shaded. It is very difficult to see the shading in the copied pages of the report. Please replace the shading with a checkmark or other symbol to make the chart readable.

Army Response: Shading is lighter when copied. Shading intensity will be increased to ensure it can be seen on future hard copy versions of the EE/CA report or the shading will be replaced with a symbol. The charts are available on the CD and the shading is more intense.

2. Appendix E Intrusive Results – Table of Findings from Parsons: Page E-56 is missing.

Army Response: The header page for Appendix E will be revised to read Table of All Findings (pages E-1 through E-53) and Table of Findings from Parsons CWM EE/CA (pages E-54 and E-55). There is no page E-56. Table of Findings from Parsons includes a title page and a table with Anomaly Ids for Pit #1, Pit #2, and Pit #3.

3. Appendix E -- Please define “OrdType from Table of Findings.

Army Response: This column includes the depth in inches for each find. The heading will be revised to “Depth (inches)”.

4. Appendix E – Table of All Findings. The following grids in the M3-Remainder Area-PR indicate disagreement between the findings reported in the Bravo Area EE/CA Overview map and the Table. Please correct the appropriate grids on the map.

Army Response: The Army’s contractor will be required to review data in the table and on the map to ensure it correlates and is correct.

- a. Grid B171: The map shows 14 anomalies found and dug (9 primaries, 5 secondaries); however there are 15 anomalies in the table.

Army Response: There is no anomaly numbered 6 in the table, thus there are 14 anomalies listed in the table.

- b. Grid B531: Map shows 1 primary found and dug, table shows 2 anomalies.

Army Response: The map grid information will be revised to reflect 2 primaries identified and dug.

- c. Grid B543: Map shows 1 primary found, 0 dug, table shows 2 anomalies.

Army Response: The grid on the map depicts that 1 primary was found, 1 secondary was found (but the number is very faint), and no anomalies were dug. The map grid information will be revised to reflect that both the primary and secondary were dug and the faint number will be replaced with boldface type.

- d. Grid B556: Map shows 27 anomalies dug (14 primaries, 13 secondaries). Table shows 32 anomalies.

Army Response: In the Table, there are no anomalies numbered 4, 5, 16, 17, 21; thus, there are 27 anomalies listed in the Appendix E table. =

- e. Grid B557: Map shows 9 anomalies found (3 primaries, 6 secondaries). Table shows 11 anomalies.

Army Response: Anomalies 277 and 278 listed in the table were surface finds. There were 3 primary anomalies and 6 secondary anomalies positioned below the surface in this grid and all were dug. The map grid information does not show that any anomalies were dug and will be corrected to show that the 9 anomalies were dug.

- f. Grid B559: map shows 7 anomalies found and dug (3 primaries, 4 secondaries). Table shows 9 anomalies.

Army Response: Anomaly 279 was a surface find. The grid information will be updated.

- 5. Appendix E – Table of All Findings. The following comments refer to the Mountain Transects performed in the M3-Remainder Area-PR.
 - a. Please explain the use of “S” in some AnomalyID’s (i.e. T03S1, T03S2, T06S1, etc.). Please describe where these items were found on the transect.

Army Response: The “S” indicates that the item was found on the surface during the surface clearance, prior to geophysical mapping. Therefore, coordinates were not collected and the position was not logged. A note will be added at the end of the Table.

- b. Many mountain transects have discrepancies between the table and the map. Please make appropriate changes to correct the map and/or the table. These include:
 - i. GridID - BMT06 AnomalyID - T06A01, T06C03, and T06F05. The target type is “small arms” (purple), but the map indicates “OE scrap” (yellow) was found in this segment of the transect.

Army Response: During the surface clearance OE scrap was identified along this transect and the exact location was not logged. The alternating colors from purple to yellow were meant to indicate that both small arms and OE Scrap was identified along a transect. However, since this is confusing, if an item located during the surface clearance was OE Scrap, the entire transect will be color coded for OE Scrap. . .

- ii. GridID - BMT08 AnomalyID – T08A01, C03, and T08E05. “OE scrap” (yellow) is indicated on the map, but “small arms” (purple) is indicated in the table.

Army Response: See response above.

- iii. GridID – BMT18, AnomalyID T18A1, T18B2, T18C3, T18D4. “Small arms” (purple) is indicated on the table, but “no metal present” (black/grey) is indicated on map.

Army Response: These segments and T18E5 on the map will be changed from “No Metal Present” to “Small Arms”. The Army will require the contractor to recheck and correlate all information on the map with Appendix E and correct information as necessary.

- iv. GridID - BMT24, Anomaly ID T24B02. “Small arms” (purple) is indicated on the table, but “non-OE scrap” (green) is indicated on the map.

Army Response: This color for this segment on the map will be changed to purple to indicate “Small Arms”.

Attachments

Attachments

Attachment 1	Intrusive Results in Supplemental Transects
Attachment 2	75mm OE/UXO Findings
Attachment 3	Munitions Response Terminology April 2005
Attachment 4	Audible Signals Recorded in Mountain Transects
Attachment 5	Revised Geophysical Section
Attachment 6	Eastern Bypass 40mm Finding
Attachment 7	Revised CSM for M3-Remainder Area-PR
Attachment 8	Quality Assurance Surveillance Plan

Attachment 1
Intrusive Results in Supplemental Transects

Supplemental Transects

GridID	Anomaly ID	Point ID	Target Type	Dig Comments	Depth
<i>BADMT30</i>					
	T30-1A	M3-Remainder Area-PR	OE Scrap	37mm, TPT	3
<i>BADMT31</i>					
	T31-2A	M3-Remainder Area-PR	OE Scrap	37mm, TPT	2
	T31-4A	M3-Remainder Area-PR	OE Scrap	37mm, TPT	0
	T31-4B	M3-Remainder Area-PR	OE Scrap	37mm, TPT	2
<i>BADMT44</i>					
	T44-1B	M3-Remainder Area-PR	OE Scrap	37mm, TPT	0
<i>BADMT63</i>					
	T63-1A	M3-Remainder Area-PR	OE Scrap	37mm, TPT	0

Information on the Supplemental Transects will be added to Appendix E, Table of All Findings.

Anomalies (Digs) in Supplemental Transects

Transect #	Date	# of Anomalies (Digs)	# of OE Scrap Items	Transect #	Date	# of Anomalies (Digs)	# of OE Scrap Items
25	7/7/2004	0		47	7/12/2004	7	
26	7/7/2004	0		48	7/13/2004	10	
27	7/27/2004	1		49	7/13/2004	15	
28	7/26/2004	1		49	7/12/2004	0	
29	7/26/2004	2		50	7/15/2004	25	
30	7/7/2004	2	1	51	7/15/2004	20	
31	7/6/2004	1	2	52	7/14/2004	2	
31	7/7/2004	5	1	53	7/27/2004	0	
32	7/19/2004	0		54	7/14/2004	1	
33	7/12/2004	0		55	7/20/2004	0	
34	7/12/2004	0		56	7/14/2004	1	
35	7/28/2004	2		57	7/14/2004	2	
36	7/22/2004	9		57	7/13/2004	0	
37	7/26/2004	0		58	7/13/2004	10	
38	7/21/2004	1		59	7/20/2004	18	
39	7/21/2004	3		59	7/19/2004	10	
40	7/13/2004	0		60	7/22/2004	11	
41	7/13/2004	0		60	7/21/2004	8	
42	7/15/2004	0		61	7/21/2004	12	
43	7/28/2004	0		61	7/20/2004	8	
44	7/14/2004	0	1	62	7/19/2004	15	
45	7/15/2004	0		63	7/7/2004	1	1
46	7/12/2004	8		64	7/7/2004	0	
				65	7/7/2004	1	

Total Digs = 212

Attachment 2
75mm OE/UXO Findings

75mm OE/UXO Findings on Fort McClellan

Alpha EE/CA

Grid	Anomaly ID	Depth	Length	Weight	Type	DigComments	Ord Type	Ord Size	Fired	Northing	Easting
A002	1	0	0.00	1.00	OE	(1) projectile, 75mm, HE, M48 not fired	Projectile	75mm	Yes	1180167.782	677861.2861
A046	9	6	6.00	2.00	UXO	(1) 75mm projo, fired, fuzed (broken)	Projectile	75 mm	Yes		

Bravo EE/CA

Grid	Anomaly ID	Depth	Length	Weight	Type	Dig Comments	Ord Type	Ord Size	Fired	Northing	Easting
003	004	6	9.00	5.00	UXO	(1) PROJECTILE, 75mm SHRAPNEL, MKI	Projectile	75 mm	Yes	1162839.68	
003	005	20	9.00	5.00	UXO	(1) PROJECTILE, 75mm SHRAPNEL, MKI	Projectile	75 mm	Yes	1162771.82	
016	007	2	0.00	0.00	UXO	(1) PROJECTILE, 75mm SHRAPNEL, MKI	Projectile	75 mm	Yes	1162047.66	
027	037	3	10.00	6.00	UXO	(1) PROJECTILE, 75mm SHRAPNEL, MKI, w/FUZE, POWDER TRAIN TIME, M1907, FUNCTIONED	Projectile	75 mm	Yes	1163959.77	
027	046	1	8.00	3.00	UXO	(1) PROJECTILE, 75mm SHRAPNEL, MKI	Projectile	75 mm	Yes	1163942.52	
055	169	0	0.00	0.00	UXO	(3) PROJECTILES, 75mm SHRAPNEL, MKI	Projectile	75 mm			
170	227	0	0.00	0.00	UXO	(1) PROJECTILE, 75mm SHRAPNEL, MKI	Projectile	75 mm			
523	009	0	8.00	11.00	UXO	(1) PROJECTILE, 75mm SHRAPNEL, MKI	Projectile	75 mm	Yes	1161505.67	
570	032	4	10.00	5.00	UXO	(1) PROJECTILE, 75mm SHRAPNEL, MKI,	Projectile	75 mm	Yes	1162520.086	
012	064	0	0.00	0.00	UXO	(1) PROJECTILE, 75mm SHRAPNEL, MKI	Projectile	75 mm			

Original Transects

T18	T18HS1	0	10.00	0.00	UXO	(1) PROJECTILE, 75mm SHRAPNEL, MKI	Projectile	75 mm	Yes		
T18	T18HS2	0	10.00	0.00	UXO	(1) PROJECTILE, 75mm SHRAPNEL, MKI	Projectile	75 mm	Yes		
T18	T18H09	0	10.00	7.00	UXO	(1) PROJECTILE, 75mm SHRAPNEL, MKI	Projectile	75 mm	Yes		

Clusters

M31m012	064				OE	(1) PROJECTILE, 75mm SHRAPNEL, MKI	Projectile	75 mm	Yes		
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Charlie EE/CA

Grid	Anomaly ID	Depth	Length	Weight	Type	Dig Comments	Ord Type	Ord Size	Fired	Northing	Easting
C032	C032001	7	8	4	UXO	(1) projectile, 75mm shrap round w/pusher plate, lead balls	Projectile	75 mm	Yes	1163632.91	678899.24
C138	C138003	12	10	10	UXO	(1) projectile, 75mm, fuze sheared, Shrap round	Projectile	75 mm	Yes	1178129.09432	684489.03718

TO 10 No 75mm Present

TO 15 No 75mm Present

TO 19 No 75mm Present

75mm OE/UXO Findings on Fort McClellan

TO 20 FWS

Segment	Anomaly ID	Depth	Length	Weight	Type	Dig Comments	Ord Type	Ord Size	Fired	Northing	Easting
172	002S	0		3	MEC	75mm, HE Nose (1 ea) w/Explosive Residue	Projectile	75MM, HE	Yes		
172	003S	0		10	UXO	75mm, Live (1 ea), 250'E of FID172 and FID173	Projectile	75MM, SHRAP	Yes		
185	002S	0		10	UXO	75mm, Live (1 ea)	Projectile	75MM, SHRAP	Yes		
61	006S	5		10	UXO	75mm, Containing Balls, Binder and Expelling Charge (1 ea)	Projectile	75MM, SHRAP	Yes		
142	002	3		10	UXO	75mm, Live (1 ea)	Projectile	75MM, SHRAP	Yes		
23	031	4		2	UXO	75mm, Unfuzed Partial with Pusher Plate and Expelling Charge (1 ea)	Projectile	75MM, SHRAP	Yes		
23	042	8		3	UXO	75mm, Unfuzed Partial with Pusher Plate and Expelling Charge (1 ea)	Projectile	75MM, SHRAP	Yes		

TO 22 Water Tanks

Grid	Anomaly ID	Depth	Length	Weight	Type	Dig Comments	Ord Type	Ord Size	Fired	Northing	Easting
B005006	014	3		12	OE	75mm shrapnel projectile. NOTE: Under tree, surrounded by roots.	Projectile	75MM	Yes		
B005006	030	3		5	OE	75mm, unfuzed w/expelling charge	Projectile	75MM	Yes		
B030035	009	16		10	OE	75mm shrapnel w/o fuze	Projectile	75MM	Yes		
Surface Sweep	008	0		10	OE	75mm Shrap, Unfuzed, Live (1 ea)	Projectile	75MM, SHRAP	Yes	N33 41.586	W85 46.112

Attachment 3
Munitions Response Terminology April 2005



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
INSTALLATIONS AND ENVIRONMENT
110 ARMY PENTAGON
WASHINGTON, DC 20310-0110

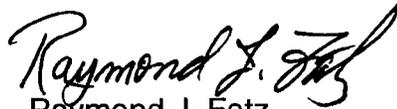
APR 21 2005

MEMORANDUM FOR THE ASSISTANT CHIEF OF STAFF FOR INSTALLATION
MANAGEMENT

SUBJECT: Munitions Response Terminology

1. This memorandum replaces my October 28, 2003 memorandum, subject: Definitions Related to Munitions Response Terms, and requests your office ensure that the enclosed terms and their definitions (Enclosure 1) are used, when appropriate, in correspondence (e.g., policies, guidance) and briefings concerning the Army's implementations of its Military Munitions Response Program (MMRP), Sustainable Range Management Program (SRMP) and, as appropriate, in other munitions-related matters.
2. In the past three years, the Department of Defense (DoD) has developed policies and guidance to implement its MMRP and SRMP. It has also worked to close a policy gap related to the management of material that may pose explosives hazards to DoD personnel and/or the public. During this period, DoD has been actively engaged, through the Munitions Response Committee (MRC), with the U.S. Environmental Protection Agency, Federal Land Managers, states, and with American Indians and Alaska Natives, to address issues related to the cleanup of munitions response sites.
3. To provide clarity and consistency in these efforts and in internal and external discussions, DoD has been working to establish and use common terms and definitions. The consistent use of accurate, descriptive terms, the definitions of which are commonly understood, is important to our dialogue with environmental regulators and safety officials, stakeholders, and the public.
4. Many of the terms that DoD has adopted for use in addressing munitions-related issues are now codified in Federal statute. On December 14, 2004, the Department of Defense Explosives Safety Board approved revisions to DoD 6055.9-STD, Ammunition and Explosives Safety Standards, using the enclosed terms.
5. The U.S. Army Technical Center for Explosives Safety, in coordination with other agencies, developed the enclosed matrix (Enclosure 2) to help the communities (e.g., operational, explosives safety, logistical, and cleanup) involved in addressing munitions-related operations to better understand how some of the new terms apply to actions they conduct.

6. Use of this terminology does not imply any specific funding authority, nor does it alter the DERP Management Guidance's program eligibility criteria.
7. My staff point of contact is J. C. King at (703) 697-5564 or jc.king@us.army.mil.



Raymond J. Fatz

Deputy Assistant Secretary of the Army
(Environment, Safety and Occupational Health)
OASA(I&E)

Enclosures

cf:

G-3

G-4

DAIM-BD

SFIM-OP

SAGC

OTJAG-ELD

NGB

CEMP-R

USACE

AEC

Enclosure 1: Military Munitions-Related Terms and Definitions

<u>Consolidated Definitions</u>
Anomaly Avoidance. Techniques employed on property known or suspected to contain UXO, other munitions that may have experienced abnormal environments (e.g., DMM), munitions constituents in high enough concentrations to pose an explosive hazard, or CA, regardless of configuration, to avoid contact with potential surface or subsurface explosive or CA hazards, to allow entry to the area for the performance of required operations.
Chain of Custody. The activities and procedures taken throughout the inspection, re-inspection and documentation process to maintain positive control of MPPEH to ensure the veracity of the process used to determine the status of material as to its explosive hazard. This includes all such activities from the time of collection through final disposition.
Chemical Agent (CA). A chemical compound (to include experimental compounds) that, through its chemical properties produces lethal or other damaging effects on human beings, is intended for use in military operations to kill, seriously injure, or incapacitate persons through its physiological effects. Excluded are research, development, testing and evaluation (RDTE) solutions; riot control agents; chemical defoliants and herbicides; smoke and other obscuration materials; flame and incendiary materials; and industrial chemicals.
Chemical Agent (CA) Hazard. A condition where danger exists because CA is present in a concentration high enough to present potential unacceptable effects (e.g., death, injury, damage) to people, operational capability, or the environment.
Chemical Agent (CA) Safety. A condition where operational capability and readiness, people, property, and the environment are protected from the unacceptable effects or risks of a mishap involving chemical warfare material (CWM) and CA in other than munitions configurations.
Chemical Warfare Material (CWM). Items generally configured as a munition containing a chemical compound that is intended to kill, seriously injure, or incapacitate a person through its physiological effects. CWM includes V- and G-series nerve agents or H-series (mustard) and L-series (lewisite) blister agents in other-than-munition configurations; and certain industrial chemicals (e.g., hydrogen cyanide (AC), cyanogen chloride (CK), or carbonyl dichloride (called phosgene or CG)) configured as a military munition. Due to their hazards, prevalence, and military-unique application, chemical agent identification sets (CAIS) are also considered CWM. CWM does not include: riot control devices; chemical defoliants and herbicides; industrial chemicals (e.g., AC, CK, or CG) not configured as a munition; smoke and other obscuration producing items; flame and incendiary producing items; or soil, water, debris or other media contaminated with low concentrations of chemical agents where no CA hazards exist.
Chemical Warfare Material (CWM) Response. Munitions responses and other responses to address the chemical safety; explosives safety, when applicable; human health; or environmental risks presented by CA-filled munitions and CA in other than munitions configurations. (See munitions response.)
Construction Support. Assistance provided by DoD EOD or UXO-qualified personnel and/or by personnel trained and qualified for operations involving CA, regardless of configuration, during intrusive construction activities on property known or suspected to contain UXO, other munitions that may have experienced abnormal environments (e.g., DMM), munitions constituents in high enough concentrations to pose an explosive hazard, or CA, regardless of configuration, to ensure the safety of personnel or resources from any potential explosive or CA hazards.
Cultural Debris. Debris found on operational ranges or munitions response sites, which may be removed to facilitate a range clearance or munitions response, that is not related to munitions or range operations. Such debris includes, but is not limited to: rebar, household items (refrigerators, washing machines, etc.), automobile parts and automobiles that were not associated with range targets, fence posts, and fence wire.
Defense Sites. Locations that are or were owned by, leased to, or otherwise possessed or used by the Department of Defense. The term does not include any operational range, operating storage or manufacturing facility, or facility that is used for or was permitted for the treatment or disposal of military munitions. (10 U.S.C. 2710(e)(1))
Discarded Military Munitions (DMM). Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of, consistent with applicable environmental laws and regulations. (10 U.S.C. 2710(e)(2))
Disposal. End of life tasks or actions for residual materials resulting from demilitarization or disposition operations.
Disposition. The process of reusing, recycling, converting, redistributing, transferring, donating, selling, demilitarizing, treating, destroying, or fulfilling other life-cycle guidance, for DoD property.

Enclosure 1: Military Munitions-Related Terms and Definitions

<p>Documentation of the Explosives Safety Status of Material. Documentation attesting that material: (1) does not present an explosive hazard and is consequently safe for unrestricted transfer within or release from DoD control, or (2) is MPPEH, with the known or suspected explosive hazards stated, that is only transferable or releasable to a qualified receiver. This documentation must be signed by a technically qualified individual with direct knowledge of: (1) the results of both the material's 100 percent inspection and 100 percent re-inspection or of the approved process used and the appropriate level of re-inspection, and (2) the veracity of the chain-of-custody for the material. This signature is followed by the signature of another technically qualified individual who inspects the material on a sampling basis (sampling procedures are determined by DoD entity that is inspecting the material).</p>
<p>Environmental Regulators and Safety Officials. Include, but may not be limited to environmental regulators, environmental coordinators or hazardous material coordinators, law enforcement officers, and safety personnel of the U.S. Environmental Protection Agency (USEPA), American Indians and Alaska Natives, other Federal Land Managers, and/or the States. When appropriate, public health officials of various agencies may also be involved.</p>
<p>Explosive Hazard. A condition where danger exists because explosives are present that may react (e.g., detonate, deflagrate) in a mishap with potential unacceptable effects (e.g., death, injury, damage) to people, property, operational capability, or the environment.</p>
<p>Explosive Ordnance Disposal (EOD). The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of unexploded ordnance and of other munitions that have become an imposing danger, for example, by damage or deterioration.</p>
<p>Explosive Ordnance Disposal (EOD) Personnel. Military personnel who have graduated from the Naval School, Explosive Ordnance Disposal; are assigned to a military unit with a Service-defined EOD mission; and meet Service and assigned unit requirements to perform EOD duties. EOD personnel have received specialized training to address explosive and certain CA hazards during both peacetime and wartime. EOD personnel are trained and equipped to perform Render Safe Procedures (RSP) on nuclear, biological, chemical, and conventional munitions, and on improvised explosive devices.</p>
<p>Explosive Ordnance Disposal (EOD) Unit. A military organization constituted by proper authority; manned with EOD personnel; outfitted with equipment required to perform EOD functions; and assigned an EOD mission.</p>
<p>Explosives or Munitions Emergency Response. All immediate response activities by an explosives and munitions emergency response specialist to control, mitigate, or eliminate the actual or potential threat encountered during an explosives or munitions emergency. An explosives or munitions emergency response may include in-place render-safe procedures, treatment or destruction of the explosives or munitions, and/or transporting those items to another location to be rendered safe, treated, or destroyed. Any reasonable delay in the completion of an explosives or munitions emergency response caused by a necessary, unforeseen, or uncontrollable circumstance will not terminate the explosives or munitions emergency. Explosives and munitions emergency responses can occur on either public or private lands and are not limited to responses at RCRA facilities. (Military Munitions Rule, 40 CFR 260.10)</p>
<p>Explosives Safety. A condition where operational capability and readiness, people, property, and the environment are protected from the unacceptable effects or risks of potential mishaps involving military munitions.</p>
<p>Interim Holding Facility (IHF). A temporary storage facility designed to hold recovered chemical warfare material (RCWM).</p>
<p>Land Use Controls (LUC). LUC are physical, legal, or administrative mechanisms that restrict the use of, or limit access to, real property, to manage risks to human health and the environment. Physical mechanisms encompass a variety of engineered remedies to contain or reduce contamination and/or physical barriers to limit access to real property, such as fences or signs.</p>
<p>Long-Term Management (LTMgt). The period of site management (including maintenance, monitoring, record keeping, 5-year reviews, etc.) initiated after response (removal or remedial) objectives have been met (i.e., after Response Complete).</p>
<p>Material Potentially Presenting an Explosive Hazard (MPPEH). Material potentially containing explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris); or material potentially containing a high enough concentration of explosives such that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production, demilitarization or disposal operations). Excluded from MPPEH are munitions within DoD's established munitions management system and other hazardous items that may present explosion hazards (e.g., gasoline cans, compressed gas cylinders) that are not munitions and are not intended for use as munitions.</p>

Enclosure 1: Military Munitions-Related Terms and Definitions

Military Munitions. Military munitions means all ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the Department of Defense, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives, and chemical warfare agents; chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges; and devices and components thereof.

The term does not include wholly inert items; improvised explosive devices; and nuclear weapons, nuclear devices, and nuclear components, other than nonnuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) have been completed. (10 U.S.C. 101(e)(4)(A) through (C))

Military Munitions Burial Site. A site, regardless of location, where military munitions or CA, regardless of configuration, were intentionally buried, with the intent to abandon or discard. This term includes burial sites used to dispose of military munitions or CA, regardless of configuration, in a manner consistent with applicable environmental laws and regulations or the national practice at the time of burial. It does not include sites where munitions were intentionally covered with earth during authorized destruction by detonation, or where in-situ capping is implemented as an engineered remedy under an authorized response action.

Minimum Separation Distance (MSD). MSD is the distance at which personnel in the open must be from an intentional or unintentional detonation.

Munition with the Greatest Fragmentation Distance (MGFD). The munition with the greatest fragment distance that is reasonably expected (based on research or characterization) to be encountered in any particular area.

Munitions and Explosives of Concern (MEC). This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks means: (A) Unexploded ordnance (UXO), as defined in 10 U.S.C. 101(e)(5); (B) Discarded military munitions (DMM), as defined in 10 U.S.C. 2710(e)(2); or (C) Munitions constituents (e.g., TNT, RDX), as defined in 10 U.S.C. 2710(e)(3), present in high enough concentrations to pose an explosive hazard.

Munitions Constituents (MC). Any materials originating from unexploded ordnance (UXO), discarded military munitions (DMM), or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions. (10 U.S.C. 2710(e)(3)).

Munitions Debris. Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

Munitions Response. Response actions, including investigation, removal actions and remedial actions to address the explosives safety, human health, or environmental risks presented by unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC), or to support a determination that no removal or remedial action is required.

Munitions Response Area (MRA). Any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples include former ranges and munitions burial areas. A munitions response area is comprised of one or more munitions response sites.

Munitions Response Site (MRS). A discrete location within an MRA that is known to require a munitions response.

Mutual Agreement. A meeting of the minds on a specific subject, and a manifestation of intent of the parties to do or refrain from doing some specific act or acts. Inherent in any mutual agreement or collaborative process are the acknowledgement of each member's role in the process and their differing views of their authorities. The mutual agreement process will provide a means of resolving differences without denying the parties an opportunity to exercise their respective authorities should mutual agreement fail to be achieved.

One Percent Lethality Distance. A distance calculated from a given CA Maximum Credible Event (MCE) and meteorological conditions (temperature, wind speed, Pasquill stability factor) and established as the distance at which dosage from that MCE agent release would be 150 mg-min/m³ for H and HD agents, 75 mg-min/m³ for HT agent, 150 mg-min/m³ for Lewisite, 10 mg-min/m³ for GB agent, 4.3 mg-min/m³ for VX vapor, and 0.1 mg-min/m³ for inhalation and deposition of liquid VX.

Enclosure 1: Military Munitions-Related Terms and Definitions

<p>On-call Construction Support. Construction support provided, on an as needed basis, where the probability of encountering UXO, other munitions that may have experienced abnormal environments (e.g., DMM), munitions constituents in high enough concentrations to pose an explosive hazard, or CA, regardless of configuration, has been determined to be low. This support can respond from off-site when called, or be on-site and available to provide required construction support.</p>
<p>On-site Construction Support. Dedicated construction support, where the probability of encountering UXO, other munitions that may have experienced abnormal environments (e.g., DMM), munitions constituents in high enough concentrations to pose an explosive hazard, or CA, regardless of configuration, has been determined to be moderate to high.</p>
<p>On-the-Surface. A situation in which UXO, DMM or CA, regardless of configuration, are: (A) entirely or partially exposed above the ground surface (i.e., the top of the soil layer); or (B) entirely or partially exposed above the surface of a water body (e.g., because of tidal activity).</p>
<p>Open Burn (OB). An open-air combustion process by which excess, unserviceable, or obsolete munitions are destroyed to eliminate their inherent explosive hazards.</p>
<p>Open Detonation (OD). An open-air process used for the treatment of excess, unserviceable or obsolete munitions whereby an explosive donor charge initiates the munitions being treated.</p>
<p>Operational Range. A range that is under the jurisdiction, custody, or control of the Secretary of Defense and that is used for range activities; or although not currently being used for range activities, that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities. (10 U.S.C. 101(e)(3)(A) and (B)). Also includes "military range," "active range," and "inactive range" as those terms are defined in 40 CFR §266.201.</p>
<p>Primary Explosives. Primary explosives are highly sensitive compounds that are typically used in detonators and primers. A reaction is easily triggered by heat, spark, impact or friction. Examples of primary explosives are lead azide and mercury fulminate.</p>
<p>Public Access Exclusion Distance (PAED). The PAED is defined as longest distance of the hazardous fragment distance, inhabited building distance (IBD) for overpressure, or the One Percent Lethality Distance. For siting purposes, the PAED is analogous to the IBD for explosives; therefore, personnel not directly associated with the chemical operations are not to be allowed within the PAED.</p>
<p>Qualified Receiver. Entities that have personnel who are, or individuals who are, trained and experienced in the identification and safe handling of used and unused military munitions, and any known or potential explosive hazards that may be associated with the MPPEH they receive; and are licensed and permitted or otherwise qualified to receive, manage, and process MPPEH.</p>
<p>Range. A designated land or water area that is set aside, managed, and used for range activities of the Department of Defense. The term includes firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, electronic scoring sites, buffer zones with restricted access, and exclusionary areas. The term also includes airspace areas designated for military use in accordance with regulations and procedures prescribed by the Administrator of the Federal Aviation Administration. (10 U.S.C. 101(e)(1)(A) and (B))</p>
<p>Range activities. Research, development, testing, and evaluation of military munitions, other ordnance, and weapons systems; and the training of members of the armed forces in the use and handling of military munitions, other ordnance, and weapons systems. (10 U.S.C. 101(e)(2)(A) and (B))</p>
<p>Range Clearance. The destruction, or removal and proper disposition of used military munitions (e.g., unexploded ordnance (UXO) and munitions debris) and other range-related debris (e.g., target debris, military munitions packaging and crating material) to maintain or enhance operational range safety or prevent the accumulation of such material from impairing or preventing operational range use. "Range clearance" does not include removal, treatment, or remediation of chemical residues or munitions constituents from environmental media, nor actions to address discarded military munitions (e.g., burial pits) on operational ranges.</p>
<p>Range-Related Debris. Debris, other than munitions debris, collected from operational ranges or from former ranges (e.g., target debris, military munitions packaging and crating material).</p>
<p>Recovered Chemical Warfare Material (RCWM). CWM used for its intended purpose or previously disposed of as waste, which has been discovered during a CWM response or by chance (e.g., accidental discovery by a member of the public), that DoD has either secured in place or placed under DoD control, normally in a DDESB-approved storage location or interim holding facility, pending final disposition.</p>

Enclosure 1: Military Munitions-Related Terms and Definitions

<p><u>Render Safe Procedures (RSP).</u> The portion of EOD procedures that involves the application of special disposal methods or tools to interrupt the functioning or otherwise defeat the firing train of UXO from triggering an unacceptable detonation.</p>
<p><u>Secondary Explosives.</u> Secondary explosives are generally less sensitive to initiation than primary explosives and are typically used in booster and main charge applications. A severe shock is usually required to trigger a reaction. Examples are TNT, cyclo-1,3,5-trimethylene-2,4,6-trinitramine (RDX or cyclonite), HMX, and tetryl.</p>
<p><u>Small Arms Ammunition.</u> Ammunition, without projectiles that contain explosives (other than tracers), that is .50 caliber or smaller, or for shotguns.</p>
<p><u>Team Separation Distance (TSD).</u> The distance that munitions response teams must be separated from each other during munitions response activities involving intrusive operations.</p>
<p><u>Technical Escort Unit (TEU).</u> A DoD organization manned with specially trained personnel that provide verification, sampling, detection, mitigation, render safe, decontamination, packaging, escort and remediation of chemical, biological and industrial devices or hazardous material.</p>
<p><u>Technology-aided Surface Removal.</u> A removal of UXO, DMM or CWM on the surface (i.e., the top of the soil layer) only, in which the detection process is primarily performed visually, but is augmented by technology aids (e.g., hand-held magnetometers or metal detectors) because vegetation, the weathering of UXO, DMM or CWM, or other factors make visual detection difficult.</p>
<p><u>Time Critical Removal Action (TCRA).</u> Removal actions where, based on the site evaluation, a determination is made that a removal is appropriate, and that less than 6 months exists before on-site removal activity must begin. (40 CFR 300.5)</p>
<p><u>Unexploded Ordnance (UXO).</u> Military munitions that (A) have been primed, fuzed, armed, or otherwise prepared for action; (B) have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and (C) remain unexploded whether by malfunction, design, or any other cause. (10 U.S.C. 101(e)(5)(A) through (C))</p>
<p><u>UXO Technicians.</u> Personnel who are qualified for and filling Department of Labor, Service Contract Act, Directory of Occupations, contractor positions of UXO Technician I, UXO Technician II, and UXO Technician III.</p>
<p><u>UXO-Qualified Personnel.</u> Personnel who have performed successfully in military EOD positions, or are qualified to perform in the following Department of Labor, Service Contract Act, Directory of Occupations, contractor positions: UXO Technician II, UXO Technician III, UXO Safety Officer, UXO Quality Control Specialist, or Senior UXO Supervisor.</p>
<p><u>Venting.</u> Exposing any internal cavities of MPPEH, to include training or practice munitions (e.g., concrete bombs), using DDES- or DoD Component-approved procedures, to confirm that an explosive hazard is not present.</p>

Military Munitions-Related Terms (1)
How do they apply to specific types of material?

Type of Material (These are only examples.)	What is it BEFORE it is inspected for explosives hazards? (2)		What is it AFTER it is inspected for explosive hazards?					
	MPPEH	Other	If it presents an explosive hazards?			If it does not present an explosive hazards?		
			MEC			MC	Munitions Debris	Other
			UXO	DMM (3)	MC (4)			
Used military munition, on a range, fired	X		X			X		
Unused military munition, on a range, apparently discarded	X			X			X	
Used military munition, in a burial pit, on an operational range or on former ranges	X		X (6)			X		
Unused military munition, in a burial pit on an operational range or on former ranges	X			X (6)			X	
Explosives in the soil	X				X (7)	X		
Refrigerator, nails, soft drink cans, old fence wire, etc.		(8)	NA	NA	NA		(8)	
Used cartridge cases, from a range, with live unused munitions possibly mixed in	X			X			(9)	
Target from a range (other than small arms range)	X		(10)	(10)	(10)		(11)	
Remnants of munitions from an operational range or former range	X		X (12)	X (12)	X (12)	X (13)		
Kicked out military munition from a former open burn or open detonation ground	X			X (14)		X		
Residual MC in a melt kettle of a former (closed) explosive cast loading building	X		(15)	(15)	X (15)	X	X (16)	
Residual MC in a floor drain pipe from an explosives-laden wash water drain of a former (closed) explosives cast loading facility.	X		(15)	(15)	X (15)		X (16)	
Residual MC in cracks in floor slab (and in soil underneath floor cracks) in a former explosives manufacturing building	X		(15)	(15)	X (15)	X	X (16)	
Small arms bullets or lead particulates in the soil from small arms use at a former small arms range used only for firing small arms ammunition		X (17)	Not Applicable (17)		X			

Note: The examples in this table are not all inclusive. The numbers in the table refer to footnotes that are found on the next page. It is important to read the footnotes, as they provide additional information of importance to understanding.

Endnotes:

- (1) DoD has been working to standardize terms related to military munitions.
- (2) Before material that is considered MPPEH can be either transferred within or released from DoD, its explosives safety status must be determined (see definition--Documentation of the Explosives Safety Status of Material). The type material involved determines the type of inspection (e.g., visual examination, chemical analysis, X-ray) required. Personnel qualified to determine the status of the particular material being examined must perform required inspections. For example, EOD and UXO-qualified personnel may inspect UXO and DMM during a munitions response or during range clearance activities. A QASAS or certified Wage Grade ammunition operator may inspect steamed-out projectiles at a depot's steam-out operation. A laboratory technician may perform a chemical analysis of soil to determine the percent explosives in the soil.
- (3) Munitions generally considered as DMM include: buried munitions; un-recovered kick outs from open detonations; munitions left behind or discarded accidentally during munitions-related activities; munitions intentionally disposed of without authorization during munitions-related activities. Munitions removed from storage for the purpose of disposal that are awaiting disposal are not DMM.
- (4) This is MC that is both (a) an explosive; and (b) present in sufficient concentrations to present explosive hazards.
- (5) This is MC that is either (a) not an explosive (e.g., lead, beryllium, and cadmium); or (b) an explosive not present in sufficient concentrations to present explosive hazards.
- (6) Although military munitions in a burial pit will normally be DMM, some may be UXO. For explosives safety reasons, munitions in a burial pit should be approached as UXO until assessed by technically qualified personnel (e.g., EOD personnel, UXO-qualified personnel) and determined that they are not UXO or that they do not present explosive hazards similar to UXO.
- (7) Explosive soil is typically found in sumps and settling lagoons for explosives-laden wastewater, and in and around drainage ditches and pipes that carry the wastewater to such sumps and lagoons.
- (8) These items are cultural debris.
- (9) After determination of their explosives safety status, used cartridge cases documented as safe would, after any demilitarization required to remove their military characteristics, be available for release from DoD. In addition to these DoD requirements, other regulatory criteria may apply.
- (10) A target is a type of range-related debris. Although a target is not MEC, it may contain UXO, DMM, or MC. Prior to its release from DoD control, its explosives safety status must be documented.

- (11) A target's explosives safety status must be documented and any demilitarization required to remove its military characteristics must be performed prior to its release from DoD control.
- (12) UXO, DMM, or MC may be found on operational ranges and on former ranges (previously referred to as closed, transferring or transferred ranges). An inspection of the material will determine into which category this material falls. For example, if a projectile breaks apart on impact, one could find (a) a sheared-off fuze, which would be UXO or (b) explosive filler, which would be MC, that broke away from the projectile's open body. If during an open detonation of an unserviceable munition that is conducted on an operational range, the donor charge detonates, but the munition being destroyed breaks up, but does not detonate, the remnants of the munition would be DMM or, if explosive residue (e.g., clumps of TNT), MC.
- (13) After determination of its explosives safety status, scrap metal from used munitions on a range that is documented as safe would, after any demilitarization required to remove its military characteristics, be available for release from DoD control. In additions to these DoD requirements, other regulatory criteria may apply.
- (14) Prudent safety practice is to consider kick outs, which have experienced an unknown environment, to be equally dangerous and managed like UXO until technically qualified personnel assess and determine that they are not UXO or do not present explosive hazards similar to UXO.
- (15) Of itself, such material (e.g., mettle kettle, drainpipes, floor slabs) do not present an explosive hazard and would not be classified as UXO, DMM or MC. However, residual MC (e.g., TNT, RDX, HMX) could remain in such material in high enough concentrations to present an explosive hazard.
- (16) After determination of its explosives safety status, such material (e.g., mettle kettle, drainpipes, floor slabs) when documented as safe would be available for release from DoD control. In addition to this DoD requirement, other regulatory criteria may apply.
- (17) At operational ranges or former ranges used exclusively for live fire of small arms ammunition, some unfired small arms ammunition may be found. Although this ammunition is considered DMM and would be MPPEH, it is not considered to present a significant explosive hazard.

Attachment 4
Audible Signals Recorded in Mountain Transects

Audible Signals from Original Bravo Mountain Transects

Sector	TransectID	Segment	Audibles
m31L	MT01	A-B	8
m31L	MT01	B-C	10
m31L	MT01	C-D	19
m31L	MT01	D-E	21
m31L	MT01	E-F	24
m31L	MT01	F-G	16
m31L	MT01	G-H	17
m31L	MT02	A-B	12
m31L	MT02	B-C	10
m31L	MT03	A-B	0
m31L	MT03	B-C	0
m31L	MT03	C-D	0
m31L	MT03	D-E	0
m31L	MT03	E-F	0
m31L	MT03	F-G	0
m31L	MT03	G-H	0
m31L	MT03	H-I	0
m31L	MT03	I-J	0
m31L	MT03	J-K	0
m31L	MT03	L-M	0
m31L	MT04	A-B	3
m31L	MT04	B-C	5
m31L	MT05	A-B	1
m31L	MT05	B-C	1
m31L	MT05	C-D	1
m31L	MT05	D-E	0
m31L	MT05	E-F	2
m31L	MT05	F-G	1
m31L	MT05	G-H	1
m31L	MT05	H-I	1
m31L	MT06	A-B	5
m31L	MT06	B-C	14
m31L	MT06	C-D	15
m31L	MT06	D-E	12
m31L	MT06	F-G	13
m31L	MT07	A-B	0
m31L	MT07	B-C	3
m31L	MT07	C-D	8
m31L	MT07	D-E	9
m31L	MT07	E-F	6
m31L	MT07	F-G	
m31L	MT07	G-H	
m31L	MT07	H-I	

Sector	TransectID	Segment	Audibles
m31L	MT08	A-B	2
m31L	MT08	B-C	2
m31L	MT08	C-D	4
m31L	MT08	D-E	3
m31L	MT08	E-F	1
m31L	MT09	A-B	1
m31L	MT09	B-C	0
m31L	MT09	C-D	0
m31L	MT09	D-E	1
m31L	MT09	E-F	2
m31L	MT09	F-G	1
m31L	MT10	A-B	1
m31L	MT10	B-C	0
m31L	MT10	C-D	0
m31L	MT10	D-E	2
m31L	MT10	E-F	1
m31L	MT11	A-B	0
m31L	MT11	B-C	1
m31L	MT11	C-D	1
m31L	MT12	A-B	0
m31L	MT12	B-C	0
m31L	MT13	A-B	8
m31L	MT13	B-C	5
m31L	MT13	C-D	5
m31L	MT14	A-B	6
m31L	MT14	B-C	7
m31L	MT15	A-B	0
m31L	MT15	B-C	1
m31L	MT15	C-D	1
m31L	MT15	D-E	0
m31L	MT16	A-B	5
m31L	MT16	B-C	4
m31L	MT16	C-D	12
m31L	MT17	A-B	11
m31L	MT17	B-C	4
m31L	MT17	C-D	0
m31L	MT17	D-E	0
m31L	MT17	E-F	4
m31L	MT18	A-B	1
m31L	MT18	B-C	1
m31L	MT18	C-D	2
m31L	MT18	D-E	6
m31L	MT18	E-F	4
m31L	MT18	F-G	18
m31L	MT18	G-H	42

Sector	TransectID	Segment	Audibles
m31L	MT18	H-I	21
m31L	MT18	I-J	18
m31L	MT18	J-K	8
m31L	MT18	K-L	6
m31L	MT18	L-M	4
m31L	MT18	M-N	4
m31L	MT18	N-O	0
m31L	MT19	A-B	0
m31L	MT19	B-C	0
m31L	MT19	C-D	0
m31L	MT19	D-E	1
m31L	MT19	E-F	1
m31L	MT20	A-B	4
m31L	MT20	B-C	2
m31L	MT20	C-D	5
m31L	MT20	D-E	0
m31L	MT21	A-B	4
m31L	MT21	B-C	4
m31L	MT21	C-D	8
m31L	MT21	D-E	5
m31L	MT21	E-F	5
m31L	MT21	F-G	0
m31L	MT21	G-H	0
m31L	MT21	H-I	2
m31L	MT21	I-J	3
m31L	MT21	J-K	9
m31L	MT21	K-L	5
m31L	MT21	L-M	0
m31L	MT21	M-N	0
m31L	MT21	N-O	5
m31L	MT21	O-P	5
m31L	MT22	A-B	0
m31L	MT22	B-C	0
m31L	MT22	C-D	1
m31L	MT22	D-E	0
m31L	MT22	E-F	0
m31L	MT22	F-G	0
m31L	MT23	A-B	8
m31L	MT23	B-C	7
m31L	MT23	C-D	7
m31L	MT23	D-E	8
m31L	MT23	E-F	0
m31L	MT24	A-B	8
m31L	MT24	B-C	10
m31L	MT24	C-D	7
m31L	MT24	D-E	5

Attachment 5
Revised Geophysical Section

3.3.3.3 Geophysical Data Acquisition

Following surface clearance and removal of brush from each grid and transect, geophysical data was collected to identify metallic subsurface items. Geophysical data were collected using the EM61 in grids, data collection transects (clusters), and delineation transects. EM61 geophysical data were digitally recorded in the field, processed, and interpreted to formulate dig sheets for intrusive personnel in 209 grids (135 original and the 74 replacement grids in M3-1L). EM61 geophysical data were digitally mapped and processed in 145 data collection transects (clusters). Of the 145 clusters that were geophysically mapped and processed, 103 were interpreted by a senior geophysicist and dig sheets formulated. Nineteen of the mapped clusters were not processed further due to boundary issues. Intrusive investigations were not conducted in these nineteen clusters due to their location near the Bravo boundary where the exclusion zones would have extended off site into public property and Highway 21. Therefore, the process of interpreting these clusters was not completed. In the remaining twenty-three mapped clusters, the teams excavated the flags placed in “real time” and did not utilize the interpreted geophysical data. Therefore, these were investigated using Mag and Dig.

3.3.3.3.1 Forty-one of the originally planned 186 clusters were not geophysically mapped due to the presence of 40mm items and were considered characterized. Prior to their characterization, twenty-one of these characterized clusters were investigated with an EM61 and the data is included in the database. The EM61 was used in “sweep” mode” by field personnel in lieu of digitally recording the instrument signal and processing and interpreting the resulting data.

3.3.3.3.2 Additionally, digital geophysical data were not recorded along the original mountain transects nor in the supplemental transects. In the Mountain Transects, geophysical data was acquired using a White’s metal detector over a 3-4 foot wide swath within a fifteen foot wide transect. Anomaly counts were based on field crews manually recording the number of audible signals heard (i.e., sweep mode) in 290 foot segments of each transect. Crews investigated/dug one anomaly in each segment; if there were no audible signals in a segment they dug two anomalies in the next segment. In the supplemental Mountain transects, geophysical data was acquired using a Schondstedt hand held locator. All anomalies were investigated. The supplemental transects were five feet wide and each segment was 290 feet long.

3.3.3.3.3 Grids were surveyed by TtFWI in the Bravo Area using an Ultra-Sonic Ranging and Data System (USRADS) for positioning and an EM61 high resolution metal detector to acquire digital geophysical data. The oversized grid method was utilized for geophysical data collection in the grids (with the exception of grids within Sector M3-1L). Within each one-acre grid, one half-acre of geophysical data was then collected, and within each half-acre grid, one quarter-acre of geophysical data was collected. This method allows collection of geophysical data within the half of each grid that has the least brush and groundcover, thereby minimizing the amount of brush cutting necessary to allow data collection (the size of the grids on the following figures is the acreage geophysically investigated). For half-acre grids that were laid out as 209-foot by 104.5-

foot rectangles, a single USRADS setup was attempted although most grids required two separate USRADS setups due to terrain and distance issues. The half-acre grids having dimensions of 147.6 feet square were laid out in sampling sector M3-1L. Data was collected from these grids predominantly using a single USRADS set up. A minimum of eight USRADS stationary receivers (SRs) were utilized for each setup. Four SRs were placed on known control points that were located by a registered professional surveyor within each setup. Three of these locations were used as fixed points within the USRADS software. The fourth known control point was not fixed and used as a quality control check on the repeatability of the overall USRADS setup between the data acquisition and the anomaly reacquisition phases.

3.3.3.3.4 EM61 data were acquired for each USRADS setup using a line spacing of approximately 2.5 ft. Geophysical data were digitally recorded at a rate of 10 readings per second, and position data at a rate of 1 reading per second. Prior to and after each data acquisition session, a metal object was traversed three times in opposite directions in order to provide information on the repeatability of the EM61 signal, as well as to evaluate the time variance inherent to the USRADS data recording process.

3.3.3.3.5 Within data collection transects (clusters), twelve parallel 200-foot segments, separated by 25 or 50-foot side segments, defining a rectangular “zigzag” data collection pattern, were established and walked. For 103 of the clusters digital geophysical data were collected in the field, processed, and interpreted to formulate digsheets for intrusive personnel. Waypoints spaced at intervals of ~ 50-100 ft within each cluster were surveyed with high-resolution DGPS measurements to an accuracy of +/- 3.3 ft in order to provide location control for the post processing of the geophysical data, as well as for reference information during target reacquisition and excavation. Although data were digitally recorded, processed and interpreted for these 103 clusters, intrusive personnel primarily used the flags placed during the acquisition effort by the field team to guide the intrusive program. The flag placement enabled crews to more quickly locate anomalies selected for reacquisition by the geophysicists. During data acquisition, the digital data from the EM61 were “paused” when an audible response occurred, and a pin flag placed at the location of the audible response. After placing the pin flag, the digital data recording process was initiated by the field team until the next audible response, where the digital recording was again “paused”. This sequence was performed throughout each of the clusters.

For twenty-one of the clusters, the one-dimensional (1D) transect data were collected using an EM61 high-resolution metal detector used in “sweep” mode. The 21 clusters are:

- M32M300 through M32M305, M32M313, M32M314, M32M317, and M32M326 through M32M347 located in M3-3H Rocket/Hand Grenade Area-D; and
 - M32M348 through M32M357 located in M3-2M Hand Grenade Area-PR.
- Audible anomalies emitted by the EM61 were flagged in the field as they were encountered during data collection (digital data were not recorded). Per the work plan for this EE/CA, the intrusive investigation locations for these twenty-one clusters were

determined based on the audible instrument response in “real time” rather than processed/interpreted digital geophysical data.

3.3.3.3.6 The delineation transects were performed over suspected high-OE density areas in Bravo. The majority of these were in the original sampling plan, since five high-density sampling sectors were identified from historical records and pre-EE/CA field reconnaissance. However, during grid sampling activities, another potential high-density OE area was discovered in the vicinity of grids 542 and 566 in the southeastern portion of M3-1L Mixed Projectile Area-PR. Thirteen delineation transects were added to the sampling plan to further characterize this new high OE density area. These seventy 1D transects were performed in order to provide additional information on the spatial extent of OE materials surrounding these grids, and were also collected using an EM61 high resolution metal detector. The delineation transect data were digitally recorded and processed/interpreted by using linear interpolation between stakes (i.e., waypoints) located with high resolution, differentially corrected Global Positioning System (GPS) data. Since these data were collected for anomaly distribution information only, intrusive activities were not performed along delineation transects.

3.3.3.4 Geophysical Data Processing

The following paragraphs discuss the major processing steps for the two-dimensional (2D) grids.

3.3.3.4.1 USRADS position data was reviewed and processed by the site geophysicist using Chemrad software version 1.54n. The relative accuracy of the acquisition track path was analyzed, as well as the correctness of the fixed points and the quality control point(s). Position and EM61 data was output as ASCII text files (*.dat) for the top and bottom EM coil readings.

3.3.3.4.2 Further processing was completed using Uradproc version 3.5 (TtFWI internally developed software) to check the data acquisition geometry and sample interval as well as the dynamic range of EM61 measurements. Bias was removed from the top and bottom coils, signal drift corrected (if necessary), and minor instrument positioning corrections applied to correct for the time lag of the USRADS data acquisition system. Where grids existed in close proximity or were conterminous, the data acquired over the time synchronized object was removed. The data was output as a single file (*.xyz) that includes position, signal intensity, and data on the sample interval and elapsed distance of the position measurements. A documentation sheet was completed for each grid processed.

3.3.3.4.3 Oasis Montage version 5.03 was used to create 2D color-coded images of the EM61 data. The 2D images and xyz profile data were assessed in terms of the background variation of the measurements and the relative quality of the track path. Figure 3-1, located at the end of this chapter, presents an example of the color-coded image maps (anomaly maps).

3.3.3.4.4 The following paragraphs discuss the processing steps that were performed for the 1D data collection transects (clusters), as well as the delineation transects.

3.3.3.4.5 GPS data for the waypoint stakes were processed using Grafnav software version 6.02. The Root Mean Squared (RMS) error of each waypoint position was analyzed. DAT61 software version 1.10 was used to assess the correctness of the fiducial marks placed in the data at waypoint markers. The background variation of the measurements was also assessed. Crwproc version 2.2 (TtFWI internally developed software) was used to link the GPS position data and EM61 measurements via an interpolation process. Bias was removed from the top and bottom coils and signal drift was corrected (if necessary). This data was output as a single file (*.xyz) that included position, signal intensity, and data on the sample interval and elapsed distance of the position measurements. A documentation sheet was completed for each grid processed.

3.3.3.4.6 Due to the constraints of the extreme terrain in the mountains, no digital geophysical data was recorded on the mountain transects. Data collection consisted of manually recording audibles received from the White's detector and Schonstedt.

3.3.3.5 Geophysical Data Interpretation

Data was interpreted using two independent modes of target prediction (1D profile data and 2D color-coded image data) to provide x, y, and z location information for each target selected, as well as the target's approximate size and depth. The 1D interpretation method was used for the delineation transects and some of the cluster mode of acquisition, and the 2D interpretation method was utilized for data acquired over survey grids. For the 1D interpretation, the EM61 and coordinate data were graphically displayed on the computer screen as data profiles for review by the interpreter. The interpreter selected the anomalies using the criteria specified in the Site-Wide Work Plan. In general, these criteria include amplitude, shape, and relationship between Ch1 and Ch2 of the EM61 signal; repeatability (standard deviation) and shape characteristics of the data points surrounding the potential target; assessment of cultural features (e.g., roads, buildings) within or adjacent to the survey area; and other pertinent information gathered from the acquisition team on the terrain, vegetation, and geology. CEHNC audited geophysical data from the Bravo EE/CA investigation and prepared a Quality Assurance Audit Evaluation. The report is included as Appendix C.

3.3.3.5.1 Digsheets were not generated for the delineation transects because the target locations selected were not planned for excavation. The interpreted data were used to provide additional information on the possible spatial distribution of OE materials near 2D survey grids where a high percentage of OE materials were identified during intrusive activities.

3.3.3.5.2 For the interpretation of the 2D survey grids the EM61 data was color-coded using an interpolation (gridding) process. Figure 3-1 is an example of the printouts of the 2D color-coded EM61 data for grids. The resulting data was interpreted using amplitude, shape, and relationship between Ch1 and Ch2 of the EM61 signal; 2D geometry (morphology) of the anomaly, including lateral gradients; geometry (shape) of the

USRADS data acquisition path (e.g., obstacles, line gaps, etc.); repeatability (standard deviation) and shape characteristics of the data points surrounding the potential target; other pertinent information gathered from the acquisition team on the terrain, vegetation, and geology; and anticipated response of the most probable munitions (MPM's)

3.3.3.5.3 As a general guideline, a single target location was selected within a 3.5-ft radius of the peak intensity value of the EM61. Peak intensity values separated by more than 3.5 ft were interpreted as individual target locations, unless the morphology of the anomaly suggested that a single target was probable. This determination is intuitive and depends upon the experience of the interpreter. The target selections were classified as primary or secondary (same as A or B target classifications in transect data) based on the overall anomaly characteristics (amplitude, shape, estimated depth and size, field notes describing above ground features, and any surface clearance, historical, and excavation data from the surrounding area). Primary targets were those most likely related to the intact OE items of interest within a specified depth range. The primary and secondary classification was used to assist in the sampling program for grids where only a percentage of the targets were excavated. Dig packages with color-coded maps, target characteristics, coordinate locations, and classifications were provided to the Senior UXO Supervisor (SUXOS) for review prior to intrusive operations.

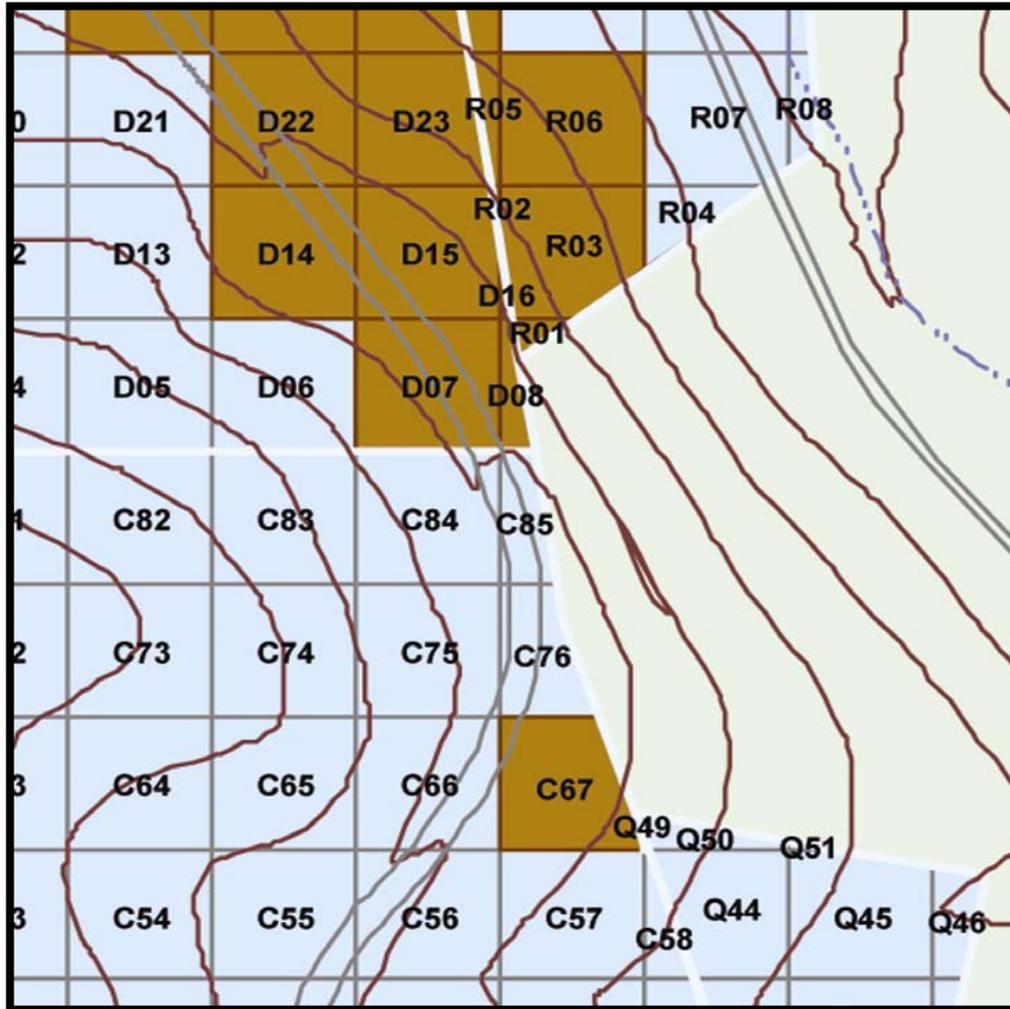
3.3.3.6 Geophysical Target Reacquisition

The target reacquisition process for the 2D grids involved positioning the USRADS SR's over the same control points used during data acquisition. Using the USRADS positioning crystal as a guide, the field crew occupied the selected target locations and interrogated the immediate area with the EM61 Hand Held (HH). A pin flag was placed at each target location and relevant data (i.e., target id, distance from interpreted location, comments, etc.) was digitally logged to a field palmtop and uploaded to the data management computer at the end of each day. No target reacquisition was required nor completed for the delineation transects. Target reacquisition for several interpreted data collection transects (clusters) in the northern portion of Bravo was completed using a tape and line method. For each interpreted anomaly the relative distance from two adjacent waypoint stakes was identified on the dig sheet. Measuring tapes were used to measure this relative distance from each waypoint and identify the anomaly location in the field.

Attachment 6
Eastern Bypass 40mm Finding

Grid C85 and Surrounding Grids
Eastern Bypass

Grids
C65
C66
C67
C74
C75
C76
C83
C84
C85
D06
D07
D08
D14
D15
D16
Q49
Q50
Q51
R01
R02
R03
R04



Grids surrounding C85

All Items Found in 200 Foot Area Surrounding Grid C85 of the Eastern Bypass

Sector	DigID	Grid	AnomalyID	Description	Comments	OrdnanceType	SpecificItem	Depth	Filler	Date	TeamLeader	Team
C	C65_01	C65	01	OE SCRAP	QC NO DIG - 60mm Mortar, HE Fins	MORTAR	FINS	0	N/A	12/28/2001	WIEDNER	USAINTR5
C	C66_04	C66	04	NON OE SCRAP	Misc Scrap	N/A	N/A	2	N/A	1/29/2002	RENNER	USAINTR3
C	C66_05	C66	05	NON OE SCRAP	Pipe 12'	N/A	N/A	1	N/A	1/29/2002	RENNER	USAINTR3
C	C66_06	C66	06	NON OE SCRAP	Brass	N/A	N/A	3	N/A	3/18/2002	Bendel	FWINTR3
C	C66_10	C66	10	NON OE SCRAP	Truck parts	N/A	N/A	1	N/A	1/29/2002	RENNER	USAINTR3
C	C66_12	C66	12	NON OE SCRAP	Rebar	N/A	N/A	5	N/A	1/29/2002	RENNER	USAINTR3
C	C67_02	C67	02	NON OE SCRAP	Nails	N/A	N/A	3	N/A	1/29/2002	RENNER	USAINTR3
C	C67_03	C67	03	NON OE SCRAP	Truck parts	N/A	N/A	3	N/A	1/24/2002	NG	USAINTR7
C	C67_04	C67	04	OE SCRAP	Signal Illum, Expended, Frag	SIGNAL	GROUND	4	N/A	1/24/2002	NG	USAINTR7
C	C67_05	C67	05	NON OE SCRAP	Misc Scrap	N/A	N/A	4	N/A	1/24/2002	NG	USAINTR7
C	C67_06	C67	06	NON OE SCRAP	Misc Scrap	N/A	N/A	8	N/A	1/29/2002	RENNER	USAINTR3
C	C67_07	C67	07	NON OE SCRAP	Misc Scrap	N/A	N/A	3	N/A	1/29/2002	RENNER	USAINTR3
C	C67_08	C67	08	NON OE SCRAP	Misc Scrap	N/A	N/A	5	N/A	1/29/2002	RENNER	USAINTR3
C	C67_09	C67	09	NON OE SCRAP	Misc Scrap and Rebar	N/A	N/A	5	N/A	1/24/2002	NG	USAINTR7
C	C67_10	C67	10	NON OE SCRAP	Misc Scrap	N/A	N/A	4	N/A	1/24/2002	NG	USAINTR7
C	C67_11	C67	11	NON OE SCRAP	Misc Scrap	N/A	N/A	4	N/A	1/24/2002	NG	USAINTR7
C	C67_12	C67	12	NON OE SCRAP	Rebar	N/A	N/A	0	N/A	1/29/2002	RENNER	USAINTR3
C	C67_19	C67	19	NON OE SCRAP	Misc Scrap	N/A	N/A	6	N/A	1/29/2002	RENNER	USAINTR3
C	C74_01	C74	01	NON OE SCRAP	Rebar	N/A	N/A	0	N/A	12/28/2001	WIEDNER	USAINTR5
C	C74_04	C74	04	NON OE SCRAP	QC NO DIG - Misc Scrap	N/A	N/A	0	N/A	12/28/2001	WIEDNER	USAINTR5
C	C74_05	C74	05	NON OE SCRAP	Rebar	N/A	N/A	0	N/A	12/28/2001	WIEDNER	USAINTR5
C	C74_09	C74	09	NO FIND	QC Pick, Nothing Found	N/A	N/A	0	N/A	12/28/2001	WIEDNER	USAINTR5
C	C74_18	C74	18	NON OE SCRAP	QC NO DIG - Misc Scrap	N/A	N/A	0	N/A	12/28/2001	WIEDNER	USAINTR5
C	C75_01	C75	01	NO FIND	QC Pick, Nothing Found	N/A	N/A	0	N/A	12/28/2001	WIEDNER	USAINTR5
C	C75_06	C75	06	NON OE SCRAP	QC NO DIG - pop top to soda can	N/A	N/A	0	N/A	12/28/2001	WIEDNER	USAINTR5
C	C85_01	C85	01	NON OE SCRAP	Rebar	N/A	N/A	0	N/A	12/28/2001	WIEDNER	USAINTR5
C	C85_06	C85	06	NON OE SCRAP	Nail 3"	N/A	N/A	0	N/A	12/28/2001	WIEDNER	USAINTR5
C	C85_07	C85	07	NON OE SCRAP	Rebar	N/A	N/A	0	N/A	12/28/2001	WIEDNER	USAINTR5
C	C85_08	C85	08	NON OE SCRAP	QC NO DIG - Banding material	N/A	N/A	0	N/A	12/28/2001	WIEDNER	USAINTR5
C	C85_09	C85	09	NON OE SCRAP	Wire	N/A	N/A	5	N/A	3/18/2002	Bendel	FWINTR3
C	C85_11	C85	11	NON OE SCRAP	Rebar	N/A	N/A	0	N/A	12/28/2001	WIEDNER	USAINTR5
C	C85_12	C85	12	OE	40mm HE, Fuze Sheared	PROJECTILE	40MM, HE	5	N/A	12/28/2001	WIEDNER	USAINTR5

All Items Found in 200 Foot Area Surrounding Grid C85 of the Eastern Bypass

Sector	DigID	Grid	AnomalyID	Description	Comments	OrdnanceType	SpecificItem	Depth	Filler	Date	TeamLeader	Team
D	D07_01	D07	01	NON OE SCRAP	Rebar	N/A	N/A	0	N/A	12/20/2001	MAZERAC	USAINTR1
D	D07_02	D07	02	OE SCRAP	Signal Illum. Expended	SIGNAL	GROUND	0	OTHER	12/20/2001	MAZERAC	USAINTR1
D	D07_03	D07	03	NON OE SCRAP	Steel bar 1.5" x 8"	N/A	N/A	0	N/A	12/20/2001	MAZERAC	USAINTR1
D	D07_04	D07	04	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_05	D07	05	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_06	D07	06	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	12/20/2001	MAZERAC	USAINTR1
D	D07_07	D07	07	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_08	D07	08	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_09	D07	09	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_10	D07	10	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_11	D07	11	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_12	D07	12	NON OE SCRAP	Cast iron pipe	N/A	N/A	0	N/A	12/20/2001	MAZERAC	USAINTR1
D	D07_13	D07	13	NON OE SCRAP	Rebar	N/A	N/A	0	N/A	12/20/2001	MAZERAC	USAINTR1
D	D07_14	D07	14	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_15	D07	15	NON OE SCRAP	CR. Concrete residue	N/A	N/A	0	N/A	12/20/2001	MAZERAC	USAINTR1
D	D07_16	D07	16	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	12/20/2001	MAZERAC	USAINTR1
D	D07_17	D07	17	NON OE SCRAP	3" x 3" piece of scrap	N/A	N/A	0	N/A	12/20/2001	MAZERAC	USAINTR1
D	D07_19	D07	19	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_20	D07	20	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_21	D07	21	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_22	D07	22	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_23	D07	23	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_24	D07	24	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_25	D07	25	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_26	D07	26	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_27	D07	27	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	1/3/2002	MAZERAC	USAINTR1
D	D07_28	D07	28	NON OE SCRAP	Wire 10"	N/A	N/A	0	N/A	12/20/2001	MAZERAC	USAINTR1
D	D07_29	D07	29	NON OE SCRAP	Wire 10"	N/A	N/A	0	N/A	12/20/2001	MAZERAC	USAINTR1
D	D07_30	D07	30	NON OE SCRAP	QC NO DIG - Brass	N/A	N/A	0	N/A	12/20/2001	MAZERAC	USAINTR1
D	D07_31	D07	31	CONST DEBRIS	Anomaly located under Iron Mountain Road, within scrap area	N/A	N/A	0	N/A	12/20/2001	MAZERAC	USAINTR1
D	D07_32	D07	32	NON OE SCRAP	QC NO DIG - Brass	N/A	N/A	0	N/A	12/20/2001	MAZERAC	USAINTR1
D	D07_33	D07	33	NON OE SCRAP	Spanner wrench	N/A	N/A	0	N/A	12/20/2001	MAZERAC	USAINTR1
D	D07_34	D07	34	NON OE SCRAP	Re-inforced Concrete	N/A	N/A	0	N/A	12/20/2001	MAZERAC	USAINTR1
D	D08_01	D08	01	NON OE SCRAP	Door hinge	N/A	N/A	4	N/A	1/3/2002	WIEDNER	USAINTR5
D	D08_01	D08	01.2	NON OE SCRAP	Pipe 2"	N/A	N/A	12	N/A	1/3/2002	WIEDNER	USAINTR5
D	D08_01	D08	01.3	NON OE SCRAP	Re-inforced Concrete	N/A	N/A	12	N/A	1/3/2002	WIEDNER	USAINTR5
D	D08_02	D08	02	NON OE SCRAP	Bolt 8"	N/A	N/A	6	N/A	1/3/2002	WIEDNER	USAINTR5
D	D08_02	D08	02.2	NON OE SCRAP	Re-inforced Concrete	N/A	N/A	36	N/A	1/4/2002	WIEDNER	USAINTR5
D	D08_03	D08	03	NON OE SCRAP	Re-inforced Concrete	N/A	N/A	36	N/A	1/4/2002	WIEDNER	USAINTR5
D	D08_04	D08	04	NON OE SCRAP	Re-inforced Concrete	N/A	N/A	36	N/A	1/4/2002	WIEDNER	USAINTR5
D	D08_05	D08	05	NON OE SCRAP	Rebar	N/A	N/A	8	N/A	1/3/2002	WIEDNER	USAINTR5
D	D08_05	D08	05.2	NON OE SCRAP	Soda can	N/A	N/A	3	N/A	1/3/2002	WIEDNER	USAINTR5
D	D08_06	D08	06	NON OE SCRAP	Re-inforced Concrete	N/A	N/A	30	N/A	1/4/2002	WIEDNER	USAINTR5
D	D08_07	D08	07	NON OE SCRAP	Bolt 8"	N/A	N/A	12	N/A	1/3/2002	WIEDNER	USAINTR5
D	D08_07	D08	07.2	OE SCRAP	Misc Frag	N/A	N/A	8	N/A	1/3/2002	WIEDNER	USAINTR5
D	D08_08	D08	08	NON OE SCRAP	QC NO DIG - Brass	N/A	N/A	1	N/A	1/3/2002	WIEDNER	USAINTR5
D	D14_01	D14	01	NON OE SCRAP	Wire	N/A	N/A	0	N/A	3/18/2002	Bendel	FWINTR3
D	D14_03	D14	03	NON OE SCRAP	Re-inforced Concrete	N/A	N/A	48	N/A	3/18/2002	Bendel	FWINTR3
D	D14_04	D14	04	NON OE SCRAP	Re-inforced Concrete	N/A	N/A	48	N/A	3/18/2002	Bendel	FWINTR3
D	D14_05	D14	05	NON OE SCRAP	Re-inforced Concrete	N/A	N/A	48	N/A	1/15/2002	MAZERAC	USAINTR1
D	D14_06	D14	06	NON OE SCRAP	Re-inforced Concrete	N/A	N/A	36	N/A	1/16/2002	MAZERAC	USAINTR1
D	D14_07	D14	07	NON OE SCRAP	Re-inforced Concrete	N/A	N/A	12	N/A	1/4/2002	WIEDNER	USAINTR5
D	D14_08	D14	08	NON OE SCRAP	Re-inforced Concrete	N/A	N/A	36	N/A	1/16/2002	MAZERAC	USAINTR1
D	D14_09	D14	09	NON OE SCRAP	Re-inforced Concrete	N/A	N/A	36	N/A	1/16/2002	MAZERAC	USAINTR1
D	D15_04	D15	04	NON OE SCRAP	Rebar	N/A	N/A	4	N/A	1/4/2002	WIEDNER	USAINTR5

Mag and Dig Information for Grids With Terrain Issues
 Eastern Bypass Area Around Grid C85

OID	Grid ID	Date	Sector	Team	Non OE Scrap	OE Scrap	Grid Complete	NumberDigs	DigDepth	Comments	ID Field
52	R01	7/31/2002	R	FWINTR2	1	0	Yes	4	10	Western edge of grid covered with construction debris and reinforced concrete	0
53	R02	7/31/2002	R	FWINTR2	1	0	Yes	3	6	Western edge is covered with construction debris	0
54	R03	7/31/2002	R	FWINTR2	3	1	Yes	16	14		0
55	R04	7/30/2002	R	FWINTR2	2	0	Yes	11	10		0
44	Q49	8/7/2002	Q	FWINTR2	0	0	Yes	0	0		0
45	Q60	8/7/2002	Q	FWINTR2	0	0	Yes	0	0		0
46	Q61	8/7/2002	Q	FWINTR2	0	0	Yes	0	0		0

OID	Grid ID	Date	Sector	Team	Non OE Scrap	OE Scrap	Grid Complete	NumberDigs	DigDepth
21810990	C65	1/21/2002	C	FWINTR1	1	1	Yes	7	7
83891563	C66	1/21/2002	C	FWINTR1	1	0	Yes	1	1
6543213	C67	1/21/2002	C	FWINTR1	2	0	Yes	22	22
518948	C74	2/19/2002	C	FWINTR1	1	1	Yes	7	7
12121	C75	2/19/2002	C	FWINTR1	1	0	Yes	5	5
10066873	C76	2/7/2002	C	USAINTR7	5	1	Yes	55	55
151001001	C76	2/5/2002	C	USAINTR7	20	2	No	110	90
234884845	C76	1/29/2002	C	USAINTR7	1	0	No	20	20
184555471	C83	2/13/2002	C	USAINTR7	2	1	Yes	50	50
5719	C84	1/31/2002	C	FWINTR2	1	0	Yes	2	2
5814	C84	2/5/2002	C	USAINTR7	2	1	No	240	230

Attachment 7
Revised CSM for M3-Remainder Area-PR

QUALITY ASSURANCE SURVEILLANCE PLAN

Ft. McClellan, AL

Site Characterization

19 May 2004

1. INTRODUCTION

This Quality Assurance Surveillance Plan (QASP) has been developed specifically for the Site Characterization at Ft. McClellan, Alabama, Contract # DACA87-99-D-0010, Task Order 0001, Modification #16. This plan sets forth procedures and guidelines that the USACE will use in evaluating the technical and safety performance of the Contractor. A copy of this plan will be furnished to the Contractor so that the Contractor will be aware of the methods that the Government will employ in evaluating performance on this contract and address any concerns that the Contractor may have prior to initiating work.

2. PURPOSE OF THE QASP

- Confirm that the data collected conforms to the approved work plan.
- Define the roles and responsibilities of participating Government officials;
- Define the types of work to be performed with required end results;
- Document the evaluation methods that will be employed by the Government in assessing the Contractor's performance;
- Provide the Corrective Action Request (CAR)/CEHNC 948 forms that will be used by the Government in documenting and evaluating the Contractor's performance; and
- Describe the process of performance documentation.

3. ROLES AND RESPONSIBILITIES OF PARTICIPATING GOVERNMENT OFFICIALS

The USACE Design Center Project Manager (DCPM), currently Mr. Dan Copeland:

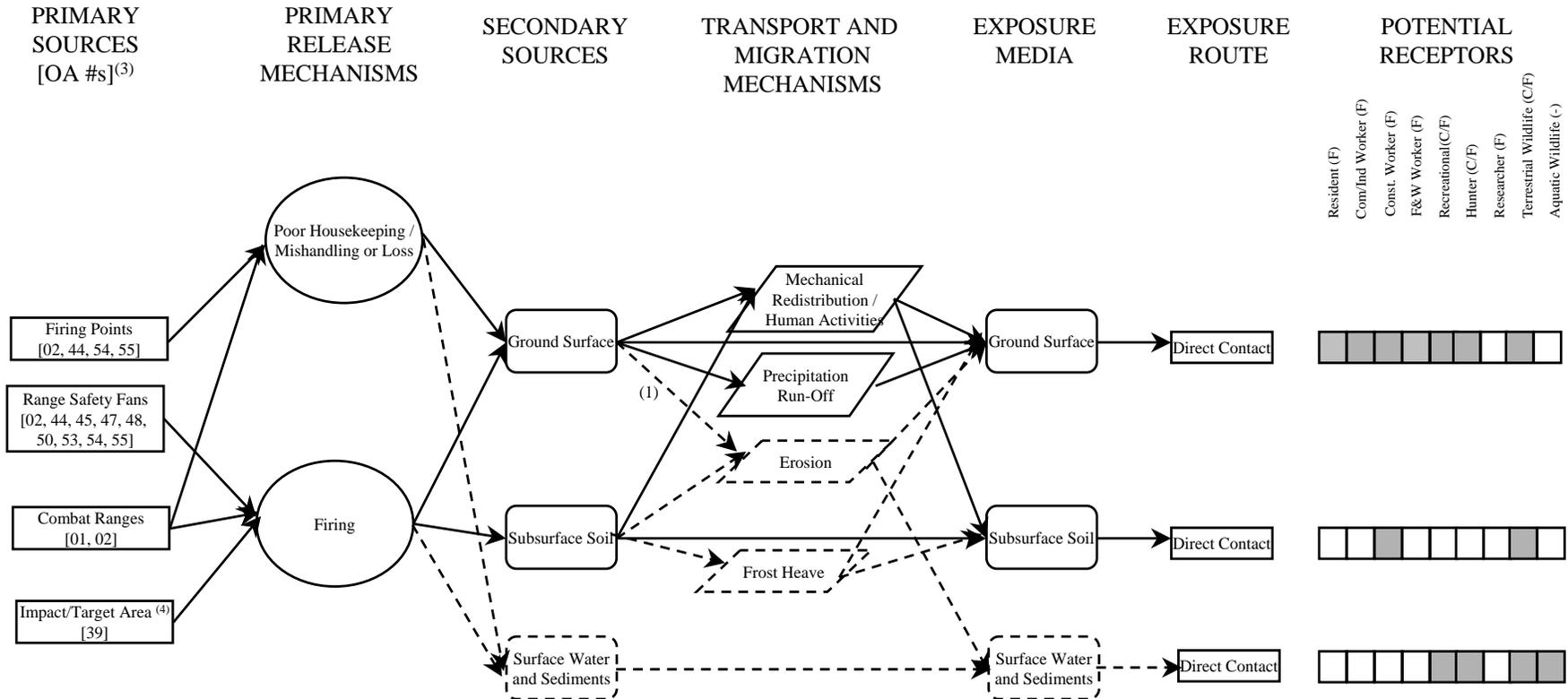
- Provides overall technical guidance to the contractor when necessary or requested for purposes of SOW clarification.
- Reviews vouchers and makes recommendations to the Contracting Officer for payment action. Vouchers are submitted monthly for work accomplished.
- Reports problems or discrepancies to the Contracting Officer as soon as possible.
- Oversees the implementation of the QASP.
- Reviews contractor submittals.
- Schedules and provides labor codes and funding for all surveillance activities with the appropriate USACE Supervisor (OE Safety Group and Geotechnical Branch).

The USACE Contract Specialist, currently Ms. Frances Steel:

- Monitors contract performance.
- Maintains central repository for all QA tasks required for payment.
- Issues all acceptance/rejection statements.

Attachment 8
Quality Assurance Surveillance Plan

**FIGURE 4-2
M3-Remainder Area-PR
CONCEPTUAL SITE MODEL**



NOTES:

- (1) Dashed boxes or lines indicate a potential source area or linkage that requires further verification or is a linkage that is indicated to be present in only a small number of specific locations.
- (2) Plate numbers obtained from the Fort McClellan Archives Search Report
- (3) Ordnance Area identification numbers obtained from the Archives Search Report.
- (4) For Non-Small Arms Munitions.
- C = Current Receptor
- F = Potential Future Receptor
- = Not plausible for this sector

PLATE NOS. (2)	OA# (3)	NAME (Other Names)	ORDNANCE AND EXPLOSIVES ASSOCIATED WITH AREA
3, 4, 10	39	World War I Artillery Range (South Half)	Artillery Munitions; Mortars
5, 10	02	Machine Gun Range	Small Arms
5, 6, 7, 10	44	Washington Rifle Range (Range 18)	Small Arms
5, 6, 7, 10	45	Range 16 (originally, later Rocket Launcher/Bazooka Range and Range17 (Rifle Grenade))	Grenade Court; Small Arms; 40mm grenades (launched); Rockets
5, 6, 10	53	60mm Mortar Range	60mm HE Mortars
5, 6, 10	55	Old Range 12 (Range 12; Rifle Field Firing)	Small Arms
6, 10	47	Range 15 (a.k.a. Combat Village)	Small Arms; Light Anti-Tank Weapon
6, 7, 10	48	Range 12 (a.k.a. Range 14)	Small Arms; Light Anti-Tank Weapon; Anti-Tank; 60mm Projectiles; Rockets
6, 7, 10	50	Range 19	Small Arms
6, 10	54	Washington Tank Range (Tank Table 1-2-3)	Small Arms; 37mm Sub Caliber Rounds; 75mm Projectile; 90mm Projectiles

The USACE Safety Specialist, currently Mr. Walt Zange (or as assigned by Chief OE Safety Group):

- Conducts reviews of contractor submittals for compliance with DOD, DA and USACE explosives safety requirements.
- Performs Daily Spot Checks of contractor compliance with DOD, DA, and USACE explosives safety requirements and explosives related procedures described in the work plan.
- Conducts Daily Spot Checks of contractor anomaly location, investigation and identification procedures for compliance with accepted practices, the approved work plan and the Task Order SOW.
- Supports all on-site QA activities as requested by the project team.
- Documents all QA surveillance activities on the Quality Assurance Reports.
- Submits all QA documentation to OE Safety Office for files.

The USACE Geophysicist, currently Mr. Jon Durham:

- Reviews contractor's work plan to assure adequacy of geophysical operations.
- Reviews contractor's final reports for adequacy of geophysical operations conducted.
- Documents all QA surveillance activities on the Quality Assurance Reports.
- Maintains files of all Geophysical QA Documentation.

4. METHODOLOGIES TO BE USED TO MONITOR THE CONTRACTOR'S PERFORMANCE

Even though the Government will be monitoring the contractor's performance on a continuing basis, the volume of tasks performed by the contractor makes technical inspections of every task and step impractical. Accordingly, USACE will use the surveillance methods described in this QASP as the basis for monitoring the contractor's performance under this specific Task Order (see paragraph 1 above).

5. QUALITY ASSURANCE REPORTING FORMS

The primary form used to document field surveillance activities is the Daily Quality Assurance Report (QAR) provided in Attachment A. This form will be used by the OE Safety Specialist and the project Geophysicist. QAR's, including any checklists used to document surveillance activities, will be provided to the Project Manager at least once each week for activities conducted the previous week. All non-conformances/violations will be documented on a Corrective Action Request (CAR) form provided in Attachment B or on CEHNC Form 948 provided in Attachment C. These forms, when completed, will document the contractor's compliance with Task Order SOW requirements. Results of surveillance activities will be used when evaluating contractor performance.

A copy of each CAR/CEHNC 948 will be provided to the Contracting Officer as soon as possible after it is provided to the contractor. All CAR's/948's issued will be filed and tracked by the project team member issuing the CAR or CEHNC Form 948. The contractor will be required to correct all nonconformances/violations regarding explosives safety issues immediately. Formal written responses to CAR's/CEHNC 948's is required.

6. QA PROCEDURES

Work Plan and QC Plan Implementation

The on-site **USACE OE Safety Specialist** monitors the contractor's implementation of the QC Plan and documents results in the Daily Quality Assurance Report (QAR). He/She will:

- Spot check instrument tests and maintenance checks.
- Spot check contractor work teams for proper use of geophysical instruments and procedures in accordance with the work plan and standard practices as well as SOW requirements (SOW paragraph 3.3).
- Spot check contractor field log books for accuracy.
- Spot check field operations daily to verify adequacy of contractor QC and safety procedures.

-The following safety violations will be documented on a CAR or CEHNC Form 948 for immediate corrective action:

- (1) Class Accidents, Contractor at fault.
- (2) Major Safety Violation (Life threatening, normally associated with activities involving OE, and any recordable accident as specified by paragraph 3-3, AR 385-40 with USACE Supplement).
- (3) Minor Safety Violation (non-life threatening, normally).

Need to stress that QA on Investigations are for process only not product.

The project **Geophysicist** will:

- Provide guidance and training, as necessary, to the OE Safety Specialist regarding the proper testing and use of the selected geophysical instruments for this site.
- Develop a Quality Assurance Report at the completion of field activities in accordance with Attachment D.

7. Documentation and Project Files

All QA surveillance documentation will be maintained in the Project Manager's project file and/or the official contract file.

Attachment A - Sample Daily Quality Assurance Report (QAR)

Attachment B - Corrective Action Report (CAR)

Attachment C - CEHNC Form 948

Attachment D - Quality Assurance Report Content

Project team concurrence:

Dan Copeland, CEHNC OE Design Center Project Manager

Frances Steel, CEHNC, Contract Specialist

Jon Durham, CEHNC Project Geophysicist

Walt Zange, CEHNC OE Safety Specialist

Attachment A
USACE ORDNANCE AND EXPLOSIVE PROJECT
DAILY QUALITY ASSURANCE REPORT

NOTE: Terminology used in this example may be outdated. This example is for format and general information purposes only.

CONTRACT WITH DELIVERY ORDER: DACA87-00-X-XXXX, Task Order # 0001, *Contractor Name*

SITE: OE Removal Action, Former Bombing and Gunnery Range – *City/County, State*

DATE: October XX, 2003

TELEPHONE NUMBER: XXX-XXX-XXXX

FAX NUMBER: XXX-XXX-XXXX

WEATHER: Mostly sunny, Low: 51 High: 72

USACE UXO SME: Joe Smith

GRIDS COMPLETED BY CONTRACTOR: Grids 1 & 2 were turned over for Government QA Inspection today. Both of these grids have failed previous Government QA Inspections. This will be the 2nd QA inspection for Grid 2, and the 3rd QA inspection for Grid 1.

QA CHECKS CONDUCTED: Observed safety briefing, intrusive operations, and demolition operations. Performed Government QA Inspection of areas completed by contractor.

GRIDS THAT PASSED QA INSPECTION: None

CEHNC FORM 948 ISSUED: One, for the 2 grids listed above that were turned over for Government QA Inspection today.

CONTRACTOR PERSONNEL ON-SITE: *Total Number on-site*

*Bill Smith	Project Manager	*Mary Smith	UXO Tech II
George Smith	SUXOS	*Ruth Smith	UXO Tech I
Harry Smith	UXOSO	Katy Smith	UXO Tech I - Tm 2
Rick Smith	UXOQCS	Jessica Smith	UXO Tech I - Tm 2
Smitty Smith	UXO Tech III - Reac	Joan Smith	UXO Tech I - Tm 2
Jeff Smith	UXO Tech III - Tm 2	Karen Smith	UXO Tech I - Tm 2
Ron Smith	UXO Tech II - Tm 2	Jane Smith	Equip Operator - Reac
Tom Smith	UXO Tech II - Tm 2		

*Not On-Site Today

GENERAL OBSERVATIONS:

1. UXO Tech II Mr. Smith was out sick today. UXO Tech I Mrs. Smith was not at the morning briefing because she was ill. The SUXOS also advised me that UXO Tech I Mr. Smith would be departing tomorrow.
2. UXO Team 2 spent the day performing investigation of “mag & flag” anomalies in Section X. Team investigated 221 “mag & flag” anomalies between waypoint 18/17 and waypoint 12. OE/UXO found on the 221 “mag & flag” anomalies consisted of 2 fuzed 3” Stokes Mortars and 12 unfuzed 3” Stokes Mortars. The 2 fuzed Stokes Mortars were destroyed in place with jet perforators inside sandbag structures and found to be sand-filled. The 12 unfuzed 3” Stokes Mortars were transported to Range 1 for disposal and found to be sand-filled after being exploited with jet perforators. OE Scrap found on the 221 “mag & flag” anomalies consisted of 36 pieces of frag from 37mm, 57mm, 60mm mortars, 81mm mortars, 3” & 4” Stokes mortars, and 75mm projectiles.
3. The Reacquisition Team used the GPS to reacquire & flag 210 dig list anomalies in Grid X (74 flagged anomalies) and Grid 21 (136 flagged anomalies) in Area G. Contractor still awaiting approval to use the G-858 system in Area G. A draft geophysical prove-out report addendum has been submitted but has yet to be approved. Upon approval of the G-858, the work plan will revision to incorporate G-858 procedures.

LESSONS LEARNED: None

DISTRIBUTION:

1-CEHNC-OE-DC (*Design Center Project Manager*)
1-CEHNC-OE-S (FILE)
1-CEHNC-CT

Attachment B

CORRECTIVE ACTION REQUEST		 NO.
<i>(1,2,3, etc. for the T.O.)</i>		
USACE Representative: Date Issued: Issued to: <i>(Contractor)</i> Response Due: <i>(Based on type of nonconformance)</i> Contract # and T.O. # Project Name/Location:		
Nonconformance Type (circle one): Critical Major Minor		
Description of Condition Found:		
Apparent Cause:		
(The Contractor will provide the following information to the Contracting Officer and USACE PM by the "Response Due" date above. Please contact the USACE Representative listed above if you have any questions)		
Actual Cause: (Contractor will investigate and determine cause of condition reported above. Actual cause should be stated as specifically as possible)		
Action Taken to Correct Condition: (Corrective Action should address root cause, not the symptom)		
Action Taken to Prevent Recurrence:		
Action Taken to Monitor Effectiveness of Corrective Action: (Generate data as proof. State the monitoring method put in place and who is responsible for reviewing data.)		
Contractor Representative Signature/Title/Date Signed: (Form must be signed before returning)		
(USACE Project Team Use Only) Review of Corrective Action: 1) Has condition improved? ___ Yes ___ No 2) Additional corrective action required? ___ Yes ___ No Comments: Completed form provided to Contracting Officer: (Date)		

Attachment D

Quality Assurance report
For
EE/CA (or Removal Action)
At
Former XXXX
Contract Number: 00000000
Task Order: 1111

1. Describe QA methods used (or reference where they are documented) and pass/fail criteria.
2. Summarize field QA activities performed and describe any special conditions encountered or special circumstances.
3. Describe any constraints or problems encountered.
4. Summarize data quality assurance activities performed and describe any special conditions encountered or special circumstances.
5. Provide list of all Corrective Action Requests and/or CEHNC Form 948's issued and describe corrective actions taken.
6. List/describe lessons learned.
7. Include a final statement that contract requirements were met regarding quality of services provided.
8. Signature of Project Engineer preparing the report.
9. List supporting data/references and where they are filed.