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March 28, 2005

U.S. Army Aviation Center - Fort Rucker
ATTN: IMSE-RCK-PWE (J. Swift)
Fort Rucker, AL 36362

RE: ADEM Review and Comment: *Stakeholder Draft Site Inspection (SI) Report, Military Munitions Response Program (MMRP)*
Dated January 2005
U. S. Army Aviation Center - Fort Rucker
Fort Rucker, Alabama
EPA I.D. No. AL6 210 020 776

Dear Mr. Swift:

The Alabama Department of Environmental Management (ADEM or the Department) has reviewed the U.S. Army Corps of Engineer's (USACE or the Corps) submittal of the MMRP *Stakeholder Draft Site Inspection (SI) Report* for the non-operational ranges located at Fort Rucker. This is the first MMRP-related correspondence submitted to ADEM for Fort Rucker. The Department of Defense (DoD) MMRP was reportedly instituted at Fort Rucker in late 2004 to aid in the investigation and remediation of sites where unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents (MC) are believed to be present. However, the MMRP does not apply to active ranges at Fort Rucker.

The sites reportedly characterized under the MMRP SI effort at Fort Rucker included six historical ranges, including: an Infiltration Grenade Range; an Anti-Tank Rocket/Grenade Range; a .22 Caliber Target Butt; and three Grenade and Bayonet Courts. The scope of the MMRP SI was reportedly limited to the portion of ranges designated as "other than operational".

Regulatory Agency Interaction Regarding Scope of the SI Effort

ADEM will first overview the events that occurred in 2004 that are related to the subject SI Report. On June 24, 2004 the Alabama Department of Environmental Management (ADEM) attended a Technical Project Planning Meeting at Fort Rucker. The conceptual

aspects of the workplan were presented to ADEM at that time. During the meeting, ADEM stated that, due to the limited scope and effort described in Malcolm Pirnie's MMRP Work Plan, the proposed site characterization of the MMRP work did not appear to be adequate.

In October 2004, ADEM participated in additional discussions about the proposed scope to clarify ADEM's position on this matter. Specifically, on October 21, 2004 ADEM participated in a teleconference with Fort Rucker, Malcolm Pirnie Inc., the U.S. Army Environmental Center (AEC) and the USACE Baltimore District to discuss the conceptual MMRP SI Work Plan in further detail. After the meeting, ADEM developed a memorandum summarizing the minutes of the discussion. This memorandum also presented the Department's position on the topics discussed in the teleconference. The memorandum was issued in draft form for review by meeting participants. After a review period, ADEM made recommended changes and issued the memorandum in final form for the project record. The final Memorandum is dated November 1, 2004 and is attached at the end of this letter for reference purposes.

This final memorandum was sent to all teleconference participants. However, on November 4, 2004, ADEM received MPI's Final SI Work Plan in which ADEM's review comments had not been addressed.

ADEM's Understanding of the Work Accomplished

ADEM has the following comments on the draft SI Report. The eight comments below apply to all of the sites investigated by MPI.

(1) MPI states that as part of the SI, it completed a magnetometer assisted site walk of "more than ten percent" of six sites: Anti-Tank Rocket/Grenade Range, Infiltration/Grenade Range, A-Grenade and Bayonet Court, B-Grenade and Bayonet Court and C-Grenade and Bayonet Court. MPI's statement that "more than ten percent of the site was covered" during the magnetometer assisted site walk is unclear. The Department requests that MPI specify what percentage of each site was actually investigated in MPI's magnetometer assisted site walks.

(2) As previously explained in meetings regarding the proposed project scope, the proposed meandering path, magnetometer assisted site investigation is inadequate to characterize or investigate historical MEC areas at this installation.

(3) ADEM finds Quality Assessment/Quality control (QA/QC) to likely be inadequate with a generic meandering path site walk. Because the meandering path method is basically without structure, is not intrusive, and yields no validated geophysical record the SI Report did not document a sufficient characterization. Furthermore, the exact location where data were collected, the exact path taken, and how much of the site was actually investigated is unclear to ADEM.

(4) In order to effectively investigate the ranges with an appropriate level of QA/QC, it is necessary to perform a more in-depth characterization using an appropriate grid-based characterization effort using an EM61-assisted (or similar) geophysical survey with intrusive investigation (i.e., digs) of anomalies. A geophysical prove out should also be conducted in accordance with a plan submitted and approved by ADEM.

(5) Multiple subsurface ferrous anomalies were reportedly detected during the magnetometer assisted site walks; however, no intrusive investigation was conducted at any of the six sites. The lack of intrusive investigation during the SI renders the magnetometer findings to be of little value.

(6) The maximum depth at which subsurface ferrous anomalies are detected using the magnetometer should be stated. However, it appears that this information is unavailable because no intrusive investigation was conducted.

(7) On what basis were subsurface anomalies determined to be small if they were not intrusively investigated? Not knowing the depth at which a UXO item is buried can lead to inaccurate conclusions concerning the size and danger posed by what may seem to be a small insignificant anomaly based solely upon a magnetometer ring off.

(8) At all six sites, a small number of randomly identified surface soil samples were collected and analyzed for explosives-related compounds. As part of a complete site characterization, subsurface soil samples should also be collected for analysis.

ADEM has additional site-specific comments. ADEM's understanding of the work completed and the reported findings at each of the six Fort Rucker sites is as follows:

Anti-Tank Rocket/Grenade Range

The SI Report stated that the Anti-Tank Rocket/Grenade Range covers approximately 57 acres; 39.1 acres have been converted into a golf course and 17.9 acres of the site are undeveloped and wooded.

In the SI, MPI reportedly conducted a visual site reconnaissance of a portion of the golf course. MPI then conducted a magnetometer assisted walk of the wooded, undeveloped area comprising the historical range.

Evidence of past DoD activity reportedly observed by MPI within and adjacent to the Anti-Tank Rocket/Grenade Range included:

- A fragment of a M28, 3.5-inch rocket consisting of the fuse and a portion of the warhead;
- A fragment consisting of a six-inch portion of the warhead from an expended M28 3.5-inch rocket;

- A fragment of the rocket motor from an expended M6A1, 2.36-inch rocket;
- Adjacent to the range, the tail fins of a partially buried rocket grenade were reportedly observed by MPI. The item was identified by Fort Rucker's Range Control as a practice rifle grenade with a missing body. Fort Rucker's Range Control reportedly removed this OE scrap item;
- A World War I era tank hull that reportedly appeared to have been used in live-fire exercises was observed approximately 50-feet outside of the non-operational range, in an area considered to still be operational;
- Twenty subsurface ferrous anomalies were detected during a magnetometer assisted site walk that were not investigated further; and,
- From an HTRW standpoint, one of ten randomly collected surface soil samples contained nitrobenzene at a concentration of 10-ug/kg, well below the USEPA Region 9 industrial preliminary remediation goal (PRG) of 100,000-ug/kg.l.

(9) Were any of the items discovered at the Anti-Tank Rocket/Grenade Range perforated or otherwise destroyed in a destructive test?

(10) Other than the first item noted above, did MPI identify any evidence of a rocket grenade fuse or motor material, in whole or in part?

(11) Was there any evidence of HE frag identified at the site?

(12) The Department notes that this range is apparently larger than originally understood by Fort Rucker. MPI needs to accurately define the present boundary of this and the other five sites.

Infiltration/Grenade Range

The Infiltration/Grenade Range covers approximately 44 acres. 33.7 acres of the former range have been developed into a golf driving range and equestrian center, both consisting of open grassy areas.

In the SI, MPI reportedly conducted a visual site reconnaissance of a portion of the driving range and equestrian center. MPI then conducted a magnetometer assisted walk of the wooded, undeveloped area comprising the historical range.

Evidence of past DoD activity reportedly observed by MPI within and adjacent to the Anti-Tank Rocket/Grenade Range included:

- In 2003, two Rifle grenades were observed and destroyed by Explosive Ordnance Disposal (EOD);
- Fifteen subsurface ferrous anomalies were detected during a magnetometer assisted site walk that were not investigated further;

- One of eleven randomly collected surface soil samples contained nitrobenzene at a concentration of 54-ug/kg, well below the USEPA Region 9 industrial preliminary remediation goal (PRG) of 100,000-ug/kg.
- One of eleven randomly collected surface soil samples contained 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene at concentrations of 58ug/kg and 64ug/kg respectively, no USEPA PRGs are available for these explosive compounds.

(13) In which of the six ranges is the World War I era tank hull located?

(14) Based on the discovery of two rifle grenades in 2003, MPI's conclusion that no significant UXO is present at this range, does not appear correct.

.22 Caliber Target Butt

The .22 Caliber Target Butt covers approximately 2.4 acres. Based on a Historical Records Review, MPI reportedly concluded that the site had been used as a small arms range and did not investigate for UXO/MEC.

In the SI, MPI reportedly conducted a site reconnaissance walk aimed at identifying a back stop berm and, if found, to determine if lead projectiles were present in the soils.

Evidence of past DoD activity reportedly observed by MPI within and adjacent to the Anti-Tank Rocket/Grenade Range included:

- An empty M48 trip flare was observed on the surface and subsequently removed by EOD;
- No evidence of a berm was observed;
- No evidence of small arms projectiles were observed in surface soil; and,
- No explosive compounds were detected in one of one surface soil sample.

(15) For the small arms range, the Department initially understood that no significant intrusive investigation was warranted. ADEM noted that the presence of impacted soils from bullets (i.e., lead/brass residue) should be readily identifiable by visual investigation, historical knowledge, XRF testing, and soil sampling. Fort Rucker reportedly intended to make an estimate on the depth of soil to be removed in small arms ranges if the reported historical use of this site was confirmed in an appropriate SI.

(16) No UXO investigation of any kind (i.e., no magnetometer assisted site walk) was conducted at this site.

(17) Based on the discovery of an M48 trip flare on the ground surface, it would appear that training other than small arms occurred at this site. Thus, further UXO investigation appears warranted at this site.

A-Grenade and Bayonet Court

The A-Grenade and Bayonet Court covers approximately 26.8 acres. 6.65 acres currently consist of buildings and/or maintained landscaping. Little is known of the site's history and the presence of MEC is also reportedly unknown.

MPI's SI reportedly consisted of conducting a magnetometer assisted walk of undeveloped, wooded portions of the range. The maintained areas (i.e., the non-wooded portions) were reportedly visually inspected by MPI during the site walk.

Evidence of past DoD activity reportedly observed by MPI within and adjacent to the Anti-Tank Rocket/Grenade Range included:

- Ten subsurface, ferrous anomalies were detected, but were not investigated;
- No frag was observed at the site; and,
- No explosive compounds were detected in three of three surface soil samples.

B-Grenade and Bayonet Court

The B-Grenade and Bayonet Court covers approximately 4.6 acres. Approximately 1.3 acres, the developed southern third of the site, consists of steel buildings, paved roads, and parking areas. The remainder of the site is primarily a wooded area. Little is known of the site's history and the presence of MEC is unknown.

MPI's SI reportedly consisted of conducting a magnetometer assisted walk of the wooded portion of the site. The heavily developed industrial area comprising the southern third of the site was reportedly not included in the walk.

Evidence of past DoD activity reportedly observed by MPI within and adjacent to the Anti-Tank Rocket/Grenade Range included:

- Two 105-mm cartridge cases were observed on the surface;
- Ten subsurface ferrous anomalies were detected during a magnetometer assisted site walk and not investigated further; and,
- No explosive compounds were detected in three of three surface soil samples.

C-Grenade and Bayonet Court

The C-Grenade and Bayonet Court covers approximately 7.6 acres. The entire site consists of mowed and maintained fairways and greens of the base golf course.

MPI's SI reportedly consisted of conducting a magnetometer assisted walk of the perimeter of the site. MPI conducted a visual inspection the remainder of the site, which consisted of the maintained areas of the golf course.

Evidence of past DoD activity reportedly observed by MPI within and adjacent to the Anti-Tank Rocket/Grenade Range included:

- Ten subsurface ferrous anomalies were detected during a magnetometer assisted site walk and not investigated further;
- One of three randomly collected surface soil samples contained 2-nitrotoluene at a concentration of 940-ug/kg, well below the USEPA Region 9 industrial preliminary remediation goal (PRG) of 100,000-ug/kg; and,
- No frag was observed at the site.

ADEM General Review Comments

(18) How does a Site Inspection differ from a Site Investigation?

(19) How does Munitions Debris differ from Frag?

(20) Historical records at military installations, especially those in service for long periods of time, could have been lost in moving from one storage location to another or mistakenly destroyed over time. This causes some recorded information on inactive sites, in some cases, to be incomplete or inaccurate. It is therefore inappropriate to base the level of site investigation warranted at the six inactive ranges solely on such records.

(21) In the November 1, 2004 Teleconference Memorandum, the Department recommended that if an impact area was known to exist or if evidence was noted of potential range training activities, then the investigation should move directly into the Remedial Investigation/Feasibility Study (RI/FS) phase of investigation. ADEM further stated that if an impact area was identified, then this would require a full to-depth clearance as part of the ensuing RI//FS effort. It appears that several known or potential impact areas were identified in the following ranges: Anti-Tank Rocket/Grenade Range (M28, 3.5-inch rocket fragment, M6A1, 2.36-inch rocket motor, tank hull, and nitrobenzene); Infiltration/Grenade Range (two Rifle grenades, nitrobenzene, 2-amino-4,6-dinitrotoluene, and 4-amino-2,6-dinitrotoluene); .22 Caliber Target Butt (M48 trip flare); B-Grenade and Bayonet Court (two 105-mm cartridge cases); and, C-Grenade and Bayonet Court (2-nitrotoluene). Thus, Fort Rucker should initiate the next phase of investigation to fully characterize and clear each range area. Please provide a workplan for the next phase of work.

(22) A magnetometer site walk at the A-Grenade and Bayonet Court did detect subsurface, ferrous anomalies, but no specific evidence of potential impact areas was identified during the current, insufficient level of investigation performed at this site.

(23) Subsurface, ferrous anomalies were detected at all of the subject inactive ranges with the exception of the .22 Caliber Target Butt, where the SI did not include a magnetometer assisted site walk.

(24) MPI states in the text that the major objectives of the SI include: (1) determining if an RI/FS is required at the site; (2) determining if an immediate response is needed; (3) determining if sites qualify for an NFA designation; (4) producing a Cost to Complete Estimation; and (5) completing a site prioritization of MMRP eligible sites.

MPI further states that, "The field activities for the SI were not intended to confirm all types of MEC present, determine MEC density, or define the limits of the MEC impacts. The goal of the field sampling activities for MC was only to determine if each site had been impacted by MC. Additionally, the SI field sampling activities were not intended to determine the nature and extent of MEC or MC contamination".

The Department notes that to accomplish the five primary objectives of the SI, it is necessary to determine the nature and extent of MEC or MC contamination. These two mission statements do not seem to set forth the same set of objectives. This apparent contradiction, or at least inconsistency, needs to be clarified.

(25) It would appear that more detailed information will be required than is currently provided in MPI's SI Report to effectively accomplish the listed objectives. If the nature and extent of unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents (MC) at a site is not adequately characterized, any decisions based on the insufficient data will be inherently unreliable.

(26) Unreliable data is not helpful to determine the most appropriate remedial action that may potentially be required at Fort Rucker's inactive ranges in the future.

(27) As noted during the October 21, 2004 teleconference call, an NFA designation will not be attainable for the referenced inactive ranges until MPI has appropriately addressed the Department's outstanding comments on the MMRP SI Work Plan, along with the review comments presented herein.

(28) Based on the limited scope of work planned and/or presently being undertaken at Fort Rucker and the failure to address ADEM's comments, the Department does not feel that the subject sites have been adequately characterized. Therefore, the Department does not believe an NFA designation for these six sites is warranted.

ADEM Procedural Comments

(29) Please explain why ADEM's recommendations, as documented in the November 4, 2004 Teleconference Memo, were not addressed.

(30) It is inappropriate to place time restrictions on ADEM review while ignoring ADEM's review comments. ADEM will review submittals as quickly as possible based on the DSMOA resources made available for regulatory oversight. However, the Department

also has a responsibility to ensure that its reviews are thoroughly complete, which may result in longer review times

(31) The Department notes that ADEM is the lead regulatory agency regarding all environmental work conducted at Fort Rucker. As this is the case, the only agency that can approve MPI's level of effort in the SI presently being conducted at Fort Rucker is the Department.

For any questions or concerns regarding this matter, please contact Mr. Mark Harrison at 334-270-5610 or via email at mdharrison@adem.state.al.us.

Sincerely,

Stephen A. Cobb, Chief
Governmental Hazardous Waste Branch
Land Division

SAC/MDH/mal

Attachment: *Teleconference Meeting Summary Memorandum* Prepared by ADEM, Dated November 1, 2005

Cc: Mr. Ken Eisele/Fort Rucker
Mr. James Grassiano/ADEM
Mr. Jon Nocera/Malcolm Pirnie Inc.
Mr. Stephen Wood/USACE
Mr. Rick O'Donnell/USACE

File: Land Division/DSMOA/HW/USA Fort Rucker/Correspondence, 2005