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Draft Removal Action Report for the Time Critical Removal Action (TCRA) at the Rocket Ridge Area (RRA) within RVAAP-004-R-01 Open Demolition Area #2 MRS
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14. ABSTRACT

This report describes the activities performed to complete the Time Critical Removal Action (TCRA) at the Rocket Ridge Area (RRA) of Open Demolition Area #2 (ODA2) at the Ravenna Army Ammunition Plant (RVAAP) in Ravenna, Ohio.

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REMOVAL ACTION REPORT FOR THE TIME CRITICAL REMOVAL ACTION (TCRA) AT THE ROCKET RIDGE AREA (RRA) WITHIN RVAAP-004-R-01 OPEN DEMOLITION AREA #2 MRS

Ravenna Army Ammunition Plant (RVAAP)
Ravenna, Ohio

Contract No. W912QR-09-P-0033

Submitted to

U.S. Army Corps of Engineers, Louisville
600 Dr. Martin Luther King, Jr. Place
Louisville, KY 40202

Submitted by

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REMOVAL ACTION REPORT

DOCUMENT DISTRIBUTION

Name/Organization	Hard Copies	Electronic Copies
BRACO Program Manger	0	1
NGB	0	1
OHARNG - Camp Ravenna	1	1
Ohio EPA–NE District - DERR	2	1
Ohio EPA–SW District - DERR	1	1
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PIKA Project Manager	2	2
REIMS	0	1
RVAAP Facility Manager	2	2
USACHPPM	1	1
USACE Program Manager - Louisville	2	1
USACE Program Manager - Baltimore	1	1
USAEC Program Manager	1	1

BRACO – Base Realignment and Closure Technical Support Office

NGB – National Guard Bureau

OHARNG – Ohio Army National Guard - Camp Ravenna

Ohio EPA-DERR – Ohio Environmental Protection Agency NE District-DERR

Ohio EPA-DERR – Ohio Environmental Protection Agency SW District-DERR

PIKA – PIKA International Inc.

REIMS – Ravenna Environmental Information Management System

RVAAP – Ravenna Army Ammunition Plant

USACHPPM – United States Army Center for Health Promotion and Preventative Medicine

USACE – United States Army Corps of Engineers – Louisville District

USACE – United States Army Corps of Engineers – Baltimore District

USAEC – United State Army Environmental Center

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LIST OF APPENDICIES

LIST OF ACRONYMS

APP	Accident Prevention Plan
BIP	Blow-In-Place
BRACO	Base Realignment and Closure Technical Support Office
CELRL	United States Army Corps of Engineers – Louisville District
DA	Department of Army
DDESB	Department of Defense Explosives Safety Board
ea	each
ECM	Earth Covered Magazine
EM	Engineering Manual
EP	Engineering Pamphlet
ESHP	Environmental Safety and Health Procedure
ESQD	Explosive Safety Quantity-Distance
ESS	Explosives Safety Submission
FM	Facility Manager
GOCO	Government Owned Contractor Operator
GP	General Purpose
HE	High Explosive
HEGP	High Explosive General Purpose
IAW	In Accordance With
IRP	Installation Restoration Program
LL	Load Line
MEC	Munitions and Explosives of Concern
MD	Munitions Debris
MGFD	Munition with Greatest Fragmentation Distance
mm	millimeter

1	MRS	Munitions Response Site
2	MSD	Minimum Separation Distance
3	NGB	National Guard Bureau
4	NOTAM	Notice to Airman
5	ODA2	Open Demolition Area #2
6	Ohio EPA	Ohio Environmental Protection Agency
7	OHARNG	Ohio Army National Guard
8	OSHA	Occupational Safety and Health Administration
9	PIKA	PIKA International, Inc.
10	PjM	Project Manager
11	RAB	Restoration Advisory Board
12	RAR	Removal Action Report
13	RRA	Rocket Ridge Area
14	RTLS	Ravenna Training and Logistics Site
15	RVAAP	Ravenna Army Ammunition Plant
16	SOW	Scope of Work
17	SSHP	Site-Specific Safety and Health Plan
18	SUXOS	Senior UXO Supervisor
19	TACOM	United States Army Tank-Automotive and Armaments Command
20	TCRA	Time Critical Response Action
21	TM	Technical Manual
22	USAEC	United States Army Environmental Center
23	USATCES	United States Army Technical Center for Explosives Safety
24	USP&FO	United States Property and Fiscal Officer
25	UXO	Unexploded Ordnance
26	UXOSO	UXO Safety Officer

1.0 INTRODUCTION

This report describes the activities performed to complete the Time Critical Removal Action (TCRA) at the Rocket Ridge Area (RRA) of Open Demolition Area #2 (ODA2) at the Ravenna Army Ammunition Plant (RVAAP) in Ravenna, Ohio. A copy of the Scope of Work (SOW) is presented in Appendix A.

The report describes the procedures, operational sequence, and resources PIKA International, Inc. (PIKA) used for the following tasks:

- Conduct access surveys of the footpaths and vehicular lanes to facilitate access for all operations conducted at the RRA Munitions Response Site (MRS) to include boundary marking and vegetation removal.
- Investigate three (3) each (ea) AN-M Series 500-pound (lb) High Explosive (HE) General Purpose (GP) bombs and blow-in-place (BIP) destruction of one (1) 105-millimeter (mm) Projectile.
- Remove acceptable-to-move AN-M Series 500-lb High Explosive General Purpose (HEGP) bombs or provide the best recommendation to address unacceptable-to-move (if required) AN-M Series 500-lb HEGP bombs.
- Conduct a Radiation Screening Survey of the RRA.
- Conduct an instrument-assisted Munitions and Explosives of Concern (MEC) and Munitions Debris (MD) density survey of the RRA MRS to determine and mark linear site boundaries and to determine the extent of contamination to assess the potential explosive hazards known to be present.
- Conduct Road Improvements to the ODA2 access road.

PIKA performed this project under Contract Number W912QR-09-P-0033 with US Army Corps of Engineers - Louisville District (CELRL), Louisville, Kentucky. The work

was performed on behalf of the CELRL. A copy of the SOW for this project is provided in Appendix A.

1.1 OBJECTIVE

The objective of this project was to mitigate or abate the immediate explosive hazards (i.e., three 500-lb HEGP bombs and one 105 mm HE Projectile), investigate the approximate nature, extent, and volume of the MEC and MD present at the site and prepare a Removal Action Report (RAR) to aid in scoping future removal actions at the RRA MRS. In addition, road improvements were conducted within ODA2 to facilitate site access to the RRA for future site operations.

1.2 RVAAP LOCATION

When the RVAAP Installation Restoration Program (IRP) began in 1989, the RVAAP was identified as a 21,419 acre installation. The property boundary was resurveyed by the Ohio Army National Guard (OHARNG) over a two year period (2002 and 2003) and the actual total acreage of the property was found to be 21,683 acres. As of February 2006, a total of 20,403 acres has been transferred to the National Guard Bureau (NGB) and subsequently licensed to the OHARNG for use as a military training site known as the Camp Ravenna. The current RVAAP consists of 1,280 acres scattered throughout Camp Ravenna.

Camp Ravenna is in northeastern Ohio within Portage and Trumbull Counties, approximately 4.8 kilometers (3 miles) east northeast of the city of Ravenna and approximately 1.6 kilometers (1 mile) northwest of the city of Newton Falls. The RVAAP portions of the property are solely located within Portage County. Camp Ravenna/RVAAP is a parcel of property approximately 17.7 kilometers (11 miles) long and 5.6 kilometers (3.5 miles) wide bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad on the south; Garret, McCormick, and Berry roads on the west; the Norfolk Southern Railroad on the north; and State Route 534 on the east. Camp Ravenna is surrounded by several communities: Windham on the north; Garrettsville 9.6 kilometers (6 miles) to the northwest; Newton Falls 1.6 kilometers (1 mile) to the south east; Charlestown to the southwest; and Wayland 4.8 kilometers (3 miles) to the south.

When RVAAP was operational, the Camp Ravenna did not exist and the entire 21,683-acre parcel was a government-owned contractor operated (GOCO) industrial facility. The RVAAP IRP encompasses investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP, references to the RVAAP in this document are considered to be inclusive of the historical extent of RVAAP, unless otherwise specifically stated. A regional map indicating the General Location and Orientation of the RVAAP is presented in Appendix B as Figure 1. A facility map of the RVAAP is presented in Appendix B as Figure 2.

1.3 RVAAP HISTORY

Production at the facility began in December 1941 with the primary missions of depot storage and ammunition loading. The installation was divided into two separate units, the Portage Ordnance Depot and the Ravenna Ordnance Plant. The Portage Ordnance Depot's primary mission was depot storage of munitions and components, while the Ravenna Ordnance Plant's mission was loading and packing major caliber artillery ammunition and the assembly of munitions initiating components that included fuzes, boosters and percussion elements. In August 1943, the installation was redesignated the Ravenna Ordnance Center and again in November 1945 as the Ravenna Arsenal.

The plant was placed in standby status in 1950 and operations were limited to renovation, demilitarization and normal maintenance of equipment, along with storage of ammunition and components. The plant was reactivated during the Korean Conflict to load and pack major caliber shells and components. All production ended in August 1957, and in October 1957 the installation was again placed in a standby condition. In October 1960 the ammonium nitrate line was renovated for demilitarization operations which involved melting explosives out of bomb casings for subsequent recycling. These operations commenced in January 1961. In July 1961 the plant was again deactivated. In November 1961 the installation was divided into the Ravenna Ordnance Plant and an industrial section, with the entire installation designated as the RVAAP. In May 1968, RVAAP began loading, assembling, and packing munitions on three Load Lines (LLs) and two

component lines in support of the Southeast Asia Conflict. These facilities were deactivated in August 1972. The demilitarization of the M71A1 90MM projectile extended from June 1973 until March 1974. Demilitarization of various munitions was conducted from October 1982 through 1992.

Until 1993 RVAAP maintained the capability to load, assemble, and pack military ammunition. As part of the RVAAP mission, the inactive facilities were maintained in a standby status by keeping equipment in a condition to permit resumption of production within prescribed limitations. In September 1993 the RVAAP was placed in inactive caretaker status, and subsequently changed to modified caretaker status. The load lines and associated real estate were determined to be excess the US Army.

Until 1999, the RVAAP was a 21,683 acre installation. A total of 20,403 acres of the former 21,683 acre RVAAP was transferred to the United States Property and Fiscal Officer (USP&FO) for Ohio in 1996 and 1999 for use by OHARNG as a military training site. The current RVAAP consists of 1,280 acres in several distinct parcels scattered throughout the RTLS. The RVAAP and RTLS are co-located on contiguous parcels of property. The RTLS perimeter fence encloses both installations.

1.4 RVAAP – ROCKET RIDGE AREA SITE DESCRIPTION

Rocket Ridge is a steep escarpment approximately 500-feet long and 25-feet high located adjacent to Sand Creek within the ODA2 (Army Environmental Database-Restoration Number RVAAP-004-R-01). A site map showing the location of RRA within the RVAAP is presented in Appendix B as Figure 2. A site map depicting the location of RRA MRS within ODA2 is presented in Appendix B as Figure 3.

The Rocket Ridge slope was likely used for the disposal of demilitarized munitions, although not all munitions appear to have been completely demilitarized. Munitions-related items that could be identified in June 2007 by PIKA, RVAAP's Unexploded Ordnance (UXO) subcontractor, included 75-millimeter and 105-millimeter projectiles, booster cups, three 500-lb bombs, white phosphorus rifle grenades, fuzes, and burster tubes. It appears that the munitions were transported from a

demolition site to the RRA of ODA2 and dumped at the top of the slope. Sand Creek flows in an eastward direction along the northern boundary of Rocket Ridge, at the toe of the slope. Due to the steep slope of the disposal area and the stream bank erosion resulting from high water events, some of the munitions materials have been deposited into Sand Creek. On 18 June 2007, a rifle grenade containing white phosphorus functioned on the slope of the RRA of ODA2. The Incident Report attributed the cause of the explosion to a corroded white phosphorus grenade that might have been overturned by an animal, which exposed the white phosphorus to air, resulting in its auto-ignition, which heated the grenade until the internal burster exploded. No injuries resulted from the incident.

2.0 TIME CRITICAL REMOVAL ACTIVITIES

The following documents were prepared and approved prior to starting TCRA at the RRA of ODA2 operations:

- June 2009, "Final Project Work Plan for the Time Critical Removal Action (TCRA) at the Rocket Ridge Area (RRA) within RVAAP-004-R-01 Open Demolition Area #2 MRS"
- June 2009, "Final Project Management Plan for the Time Critical Removal Action (TCRA) at the Rocket Ridge Area (RRA) within RVAAP-004-R-01 Open Demolition Area #2 MRS"
- June 2009, "Final Public Involvement Plan Addendum for Rocket Ridge at Ravenna Army Ammunition Plant"
- July 8, 2009 "RVAAP Final Explosives Safety Submission for the Time Critical Removal Action (TCRA) at the Rocket Ridge Area (RRA) within RVAAP-004-R-01 Open Demolition Area #2 MRS"
- July 17, 2009, "Addendum to the Final Site Safety and Health Plan Time Critical Removal Action (TCRA) at the Rocket Ridge Are (RRA) within RVAAP-004-R-01 Open Demolition Area 2 MRS"

The sequence of operations for the TCRA at the RRA of ODA2 as approved in the work plan was:

- Mobilization and Site Preparation - Conducted 13 – 17 July 2009;
- Access surveys and vegetation removal – Conducted 20 - 23 July 2009;
- Investigation of 3 AN-M Series 500-lb HEGP bombs – Conducted 27 July 2009;
- Blow-in-place of one (1) 105-mm HE Projectile - Conducted 29 July 2009;
- Radiation Screening Survey – Conducted 30 July to 13 August 2009;
- Instrument-assisted MEC and MD density survey – Conducted 6 – 11 August 2009;
- ODA2 Access Road improvements – Conducted 17 – 19 August 2009;

- Site restoration – Conducted 24 August 2009.

Details pertaining to each of the TCRA field operations are provided in the subsections that follow. Photographic documentation of the TCRA field operations are provided in the Weekly Reports that are contained in Appendix C.

2.1 MOBILIZATION AND SITE PREPARATION

2.1.1 Mobilization of Manpower

All PIKA personnel that were mobilized to the site met requirements for Occupational Safety and Health Administration (OSHA) hazardous waste operations training and medical surveillance requirements as specified in the Accident Prevention Plan/Site-Specific Safety and Health Plan (APP/SSHP). Site personnel were also trained to perform the specific tasks to which they were assigned. Mobilization was conducted from 13 – 17 July 2009.

2.1.2 Preliminary Activities

During the initial mobilization, PIKA site management personnel were engaged with the following preliminary activities:

- Coordination with the designated RVAAP Facility Manager (FM) to finalize access requirements, location of any temporary facilities to be used, and communications requirements;
- Contact and coordination with RVAAP FM and local fire, medical, and other emergency services to ensure availability of services, and the appropriate response actions in accordance with (IAW) the Final Work Plan and APP;
- Contact and coordination with local vendors for accommodations as well as vendors/suppliers for routine purchases to ensure smooth project start up; and
- Inspection of each work area to identify possible environmental constraints, terrain limitations, and other interferences.

2.1.3 Equipment

All equipment was inspected as it arrived to ensure its proper working order. All instruments and equipment that required routine maintenance and/or calibration were checked initially upon its arrival and then checked again prior to its use each day. As part of the initial equipment set-up and testing, PIKA also installed and tested its communication equipment that includes the following:

- Cellular Phone Service to maintain communication with RVAAP security personnel.
- Hand-held portable radios used to maintain communications between the office trailer, Project Manager/Senior UXO Supervisor (PjM/SUXOS), and the field teams.
- Cellular telephones equipped with Direct Connect Service (very high frequency band) to be used as back up communications between the office trailer, SUXOS, and the field teams.

2.1.4 Site-Specific Training

As part of the mobilization process, PIKA performed site-specific training for all on-site personnel assigned to this project. The purpose of this training was to ensure that all on-site personnel fully understood the operational procedures and methods to be used by PIKA at RVAAP. Individual assigned responsibilities and safety and environmental concerns associated with site operations were also covered in the training. The SUXOS/UXOSO conducted the training sessions which included the topics identified below.

- Field equipment operation, including the safety and health precautions, field inspection and maintenance procedures that were to be used.
- Interpretation of relevant sections of the Final Work Plan and APP/SSHP as they relate to the tasks being performed.
- Personnel awareness of potential site and operational hazards associated with site-specific tasks and operations.

- Public relations to ensure that personnel did not make any public statements to the media without prior coordination with and approval from the RVAAP FM.

- Environmental concerns and sensitivity including endangered/threatened species and historic, archeological, and cultural issues.

- Additional OSHA or CELRL required training per the approved APP.

- Identification features, hazards, and disposal methods of MEC/UXO found or potentially encountered.

2.2 PROJECT NOTIFICATIONS AND SURVEYS

2.2.1 Public Notification

In accordance with the Final RVAAP Public Involvement Plan addendum, the public was informed of the Rocket Ridge TCRA project during the 20 May 2009 Restoration Advisory Board (RAB) meeting at the Paris Township Hall located at 9355 Newton Falls Road in Ravenna. Subsequent to the project introduction, a project update detailing the status and findings of the TCRA at Rocket Ridge was shared with public during the 19 August 2009 RAB meeting that was held at the Charlestown Town Hall located at 6368 Rock Spring Road in Ravenna, Ohio. Both the RAB project introduction and update meetings were presented by PIKA on behalf of the CELRL. Additional public notifications conducted as part of the TCRA at Rocket Ridge are described in Section 2.2.2 of this report.

2.2.2 Emergency Response and General Notifications

PIKA contacted all local emergency services to verify the availability of requisite services and to confirm the means used to summon the services prior to the initiation of field activities. Prior to initiating BIP operations for the 105-mm HE Projectile, PIKA submitted the Ohio Environmental Protection Agency (Ohio EPA) MEC Demolition/Disposal Notification and issued a Notice to Airman (NOTAM) with the Cleveland Air Route Traffic Control Center, Airspace and Procedures Office.

Copies of the Ohio EPA MEC Demolition/Disposal Notification and NOTAM for the TCRA at RRA are provided in Appendix D.

Additionally, at least one week prior to initiating the TCRA field activities, an official Public Notification summarizing the TCRA activities and anticipated schedule was sent (via fax as per Public Involvement Plan) to the key project personnel and the local emergency response and news organizations. This included the contacts listed below. A copy of the Public Notification that was issued for the TCRA at RRA is provided in Appendix E.

- RVAAP Security Dispatcher (Post 1) – (330) 358-2017
- Ravenna City Fire Department – (330) 296-5783
- Ravenna Police Dept. – (330) 297-6486
- RVAAP Caretaker Contractor (PIKA International, Inc.) – (330) 358-3005
- Hospital – Robinson Memorial Hospital – (330) 297-0811
- Police – Portage County Sheriff Office – (330) 296-5100
- Police – Trumbull County Sheriff Office – (330) 675-2508
- Ohio State Patrol – (330) 297-1441
- Glenn Beckham – CELRL PjM – (502) 315-6799
- Nathaniel Peters II – CELRL Technical Manager – (502) 315-6333
- Todd Hornback – CELRL Public Affairs Specialist – (502) 315-6768

- Mark Patterson – RVAAP Facility Manager – (330) 358-7311
- Ohio EPA – Eileen Mohr – (330) 963-1221
- OHARNG – Lt. Col. Ed Meade – (614) 336-6560

- Katie Elgin – Camp Ravenna Environmental Specialist – (614) 336-6136

- Local News Media: Television Stations

  WEWS TV ABC News Channel 5 - (330) 434-0616
  WVPX 23 TV - (330) 434-2323
  WVIZ PBS Ideastream - (216) 961-6100
  WEAO TV Channel 49 - (330) 677-4549
  WBNX-WB - (440) 843-5555
  WOIO-CBS - (216) 771-1943
  WYTV-ABC - (330) 783-2930
  WKYC- NBC - (216) 344-3333
  WKBN-FOX - (330) 782-1144

  Radio Stations

  WJMP 1520 AM - (330) 678-1520
  WAPS 91.3 - Quality Rock – (330) 761-9277
  WNIR-100-Talk - (330) 673-2323
  Clear Channel Radio - (216) 520-2600

  Newspapers

  Youngstown Publishing Co - (330) 744-5023
  Tribune Chronicle - (330) 841-1600
  Record-Courier - (330) 296-9657
  The Vindicator - (330) 392-0176
  Associated Press - (216) 771-2172
  Akron Legal News Inc - (330) 376-0917
  Akron Beacon Journal - (330) 996-3600

2.2.3 Tenant Relocation

PIKA worked with the RVAAP FM to minimize any effect of performing the tasks outlined in the Final Work Plan. The TCRA operations required a 2,501 foot Minimum Separation Distance (MSD) during the bomb investigation and BIP operations and a 680 foot MSD during the MEC and MD Density Survey operations. Per the TCRA Explosive Safety Submission (ESS), all non-essential personnel to the TCRA at RRA

of ODA2, complied with the approved Explosive Safety Quantity-Distance (ESQD) arcs.

2.3 ACCESS SURVEYS AND VEGETATION REMOVAL

2.3.1 Access Surveys

PIKA UXO Technicians conducted access surveys of the footpaths and vehicular lanes to facilitate access for all operations at the RRA MRS IAW Engineering Pamphlet (EP) 75-1-2. All vehicular access lanes were cleared to a width of twice as wide as the largest support vehicle that was used on each route. All footpaths and vehicular lanes were both surface cleared visually and subsurface cleared utilizing a Schonstedt GA-52Cx metal detector and a XLT-E Series all whites metal detector to locate potential MEC/UXO just below the surface. Pictures of UXO personnel conducting access surveys are provided in Appendix C.

2.3.2 Vegetation Removal

PIKA conducted manual and mechanical brush removal of the access footpaths and vehicular lanes required at the RRA MRS IAW EP 75-1-2 from 20 - 23 July 2009. The brush removal primarily included the cutting and trimming of ground level vegetation to facilitate completion of the TCRA operations. PIKA used hand-held gasoline powered weed-eaters to cut ground level vegetation as needed. Prior to and during vegetation removal, UXO Technicians visually searched the area where the vegetation was to be removed to ensure it was free of surface MEC/UXO or other items that could have presented a physical hazard. During the brush removal, the affected site personnel utilized all the safety and health personal protective equipment specified in the APP and maintained the required team separation distances per the TCRA ESS. Pictures of the vegetation removal operations are provided in Appendix C.

2.3.3 Footpath and Vehicular Lane Boundary Marking

The UXO Technicians marked the boundaries of each survey's access route and the investigation site at the RRA MRS using survey flagging ribbon and/or pin flags IAW EP 75-1-2. The SUXOS established a system of flagging ribbon/pin flags colors that distinguished route boundaries from anomalies, MEC/UXO(s) or utilities.

2.3.4 MEC/UXO Encountered

During the access surveys a total of 101 acceptable to move MEC items were encountered and placed in storage at the on site Earth Covered Magazine (ECM) 7-C-4 for inspection and disposal under a separate contract. A copy of the MEC Tracking Log listing each of the items, storage location and final disposition is provided in Appendix F. The location of each MEC item was surveyed prior to removal. Survey Report #1 (Appendix H) shows the location of the acceptable to move MEC items within the RRA MRS.

2.4 INVESTIGATION OF THREE AN-M SERIES 500-LB HEGP BOMBS

IAW the approved Work Plans, PIKA UXO Technicians performed a thorough investigation/reconnaissance of the three AN-M Series 500-lb HEGP bombs on 27 July 2009. The objective of the investigation was to positively determine if the fuze wells in each bomb were fuzed or un-fuzed. All three of the bombs were located along the bottom of the main dump area (i.e., toe of slope) of the RRA. The investigation was conducted by carefully removing debris and soils from around each of the items to allow for visual inspection of the fuze wells. During the bomb investigation road guards were strategically positioned along RVAAP Facility roadways to ensure all non-essential personnel were evacuated and maintained outside the 2,501 MSD.

Results of the investigation revealed that none of the three 500-lb bombs were fuzed. Large pieces of bomb fragments were unearthed at two of the locations while an almost fully intact empty body of a bomb was unearthed at the third location. At the completion of the investigation, all resultant bomb remnants were inspected and determined to be free of explosive hazards. Figure 4 in Appendix B

documents the surveyed locations of where the bomb remnants were staged for removal during future RRA MRS removal operations under a separate contract. Photo documentation of the bomb investigation operations are provided in Appendix C.

2.5 BLOW-IN-PLACE ONE (1) 105-MM HE PROJECTILE

Following completion of the bomb investigation operations, PIKA UXO Technicians completed BIP operations for the fuzed and fired 105-mm HE Projectile present at the site on 29 July 2009. All BIP operations were conducted using sandbag mitigation engineering controls IAW U.S Department of Army (DA) Technical Manual (TM) 60A-1-1-31, Engineering Manual (EM) 385-1-97, Basic Safety Concepts and Considerations for Munitions and Explosives of Concern (MEC) Removal Action Operations, dated 27 August 2004, publication HNC-ED-CS-S-98-7, dated August 1998.

The Munition with the Greatest Fragmentation Distance (MGFD) for the open detonation utilizing BIP procedures of the 105-mm Projectile was the AN-M Series 500-lb bomb as per the Department of Defense Explosives Safety Board (DDESB) approved TCRA ESS. During BIP demolition operations, all non-essential personnel were evacuated to locations outside the required intentional detonations MSD, and all essential personnel were evacuated outside the MSD prior to initiation of demolition charges. Road guards were strategically positioned along RVAAP Facility roadways to ensure all non-essential personnel were maintained outside the 2,501 MSD.

Following construction of the sandbag enclosure, two perforators (each containing 22 grams of donor explosives) were placed in intimate contact with the 105-mm HE Projectile. The 105-mm HE Projectile was then vented (disposed) by countercharging the projectile with the explosive donor charge (perforator) and detonating the donor charge. All disposal (venting) operations were performed under the direction and supervision of the SUXOS. During these operations, the UXOSO closely monitored the operation at hand, strictly enforcing safety and adherence to Environmental Safety and Health Procedures (ESHPs) and the Final

Work Plan documents. The venting operations were successful and resulted in a high order detonation as determined by the SUXOS. Copies of the Demolition Shot Logs are provided in Appendix K. Photo documentation of the BIP operations is provided in Appendix C.

2.6 RADIATION SCREEN SURVEY

Due to the history of work with the Monazite sands and Radiography operations at the RVAAP, the Facility Manager requested that screening for radioactive materials be conducted prior to and during intrusive operations at the RRA strictly as a precautionary measure to ensure personnel safety. All radioactive screening operations were conducted in accordance with the "Addendum to the Final Safety and Health Plan, for the TCRA at the RRA within RVAAP-04 Open Demolition Area #2, Ravenna Army Ammunition Plant, Ravenna, Ohio" dated July 17, 2009. PIKA conducted the radiation survey operations from 30 July to 13 Aug, 2009. Results of the screening indicate a natural distribution of radiation across the site. Details pertaining to the RRA radiation screening operations are provided in the radiation screening survey report presented in Appendix G.

2.7 INSTRUMENT-ASSISTED MEC AND MD DENSITY SURVEY

2.7.1 MEC and MD Density Survey

PIKA conducted an instrument-assisted MEC and MD density survey of the RRA MRS at ODA2, RVAAP through the use of a Schoenstedt GA-52Cx metal detector and a XLT-E Series all whites metal detector to determine and mark all linear site boundaries for use in calculating the extent of contamination at the RRA MRS. All boundaries were surveyed and mapped by a State of Ohio registered surveyor. The MEC and MD density survey activities were conducted between Aug 6th to Aug 11th, 2009. Specific anomalies were not marked during the survey operations, instead UXO Technicians defined the RRA MRS East, West, South and North boundaries based upon visual quantification of surface MEC/anomalies and an all metals detector assisted intensity fall-off response due to the fact that the RRA MRS is

highly concentrated with metal. Geophysical investigation was not included with this investigation.

During the survey operations it was verified that the RRA MRS is actually comprised of two distinct areas. The first area is the main dump portion and the second area is the white phosphorus contaminated area. The main dump portion resides along the sloped portion of the RRA while the white phosphorus area is located at the bottom of the slope within a fairly flat area immediately adjacent to Sand Creek. Survey Report #2 (appendix H) shows the location and layout of each of these areas within the RRA MRS at ODA2.

In addition to the acceptable-to-move type MEC items noted on the MEC tracking Log (Appendix F), the main dump area contains fragments and pieces of various sized projectiles, fuzes, black stained soils, a littering of burster tubes, booster cups, deteriorated wooden crates and mixing pots as well as two heavily concentrated areas of munitions primers and Point Initiating Base Detonating (PIBD) fuzes. Pictures of the main dump area of the RRA and its associated debris are provided in Appendix C.

The main dump area is primarily funnel shaped, however the lateral extent of debris associated with this portion of the site extends to a maximum of 40 feet across the top of the slope (east & west) and 45 feet down the slope (south to north). Survey Report #3 (Appendix H) shows the orientation and full lateral extent of the main dump area of the RRA MRS as determined by the MEC and MD density survey operations.

The white phosphorus area is an area within the RRA MRS that appears to have been used exclusively for the dumping and disposal of discarded components from the M19 white phosphorus grenades. This area is primarily comprised of tail fin assemblies and fragments from the M19 white phosphorus rifle grenades; however based upon the white phosphorus rifle grenade incident reported on June 18, 2007, it is very likely that intact M19 white phosphorus grenades are co-mingled with the debris within this portion of the RRA.

The white phosphorus contaminated area is roughly oval in shape and is approximately 56 feet long and 36 feet wide at its extremes. Debris from the area, including visible white phosphorus, extends approximately 15 feet into Sand Creek from the shore line. Survey Report #3 (Appendix H) shows the orientation and lateral extent of the white phosphorus area of the RRA MRS. Pictures of the white phosphorus area are provided in Appendix C.

In order to determine the approximate depth and volume of material present at the RRA MRS for use in scoping the future removal operations, PIKA dug test pits at strategic locations around the RRA MRS as part of the MEC and MD density operations. However, due to health and safety concerns no test pits were dug within the white phosphorus area. Instead, surface elevations were recorded within the white phosphorus area for comparison to natural grade elevations collected outside the affected area. The elevations ranged from 1,024 above mean sea level within the stream bed just north of the white phosphorus area to 1,028 above mean sea level in the center of the area, and to a maximum of 1,034 above mean sea level at its southern extent (i.e., near the toe of the slope of the main dump area). Survey Report #4 (Appendix H) shows the range in elevation and contours within the white phosphorus area.

Based on the range in elevation across the white phosphorus area (surveyed at 1,526 total sq. feet) and field observations conducted by the UXO personnel; it is estimated that the average depth of material within the white phosphorus area is approximately four (4) feet. To that end, it is estimated that there is approximately 270 cubic yards of white phosphorus contaminated material that will need removed during future removal operations. Survey Report #5 (Appendix H) shows the limits of the white phosphorus area along with a summary of the volume calculations for the white phosphorus contaminated area of the RRA MRS.

For the Main Dump Area the approved Work Plan called for a total of nine (9) test pits; three (3) representing the top third (1/3) of the ridge/hill, 3 representing the middle 1/3, and 3 representing the bottom 1/3. However, while installing the first

test pit within the main dump area it was determined by the SUXOS that the UXO personnel could safely dig only up to a maximum of three feet due to the site conditions (slumping and debris encountered). As such, a series of test pits were installed along the perimeter of the main dump area just outside the debris field in order to determine maximum depth to the bottom of the piled debris. As such, three (3) test pits were installed along the western perimeter, three (3) along the eastern border, and one (1) along the top of the slope (southern border) for a total of eight (8) test pits; including the one (1) test pit installed within the main dump area. The test pits were hand dug using long and short handled shovels and trowels. Survey Report #6 (Appendix H) shows the locations of all 8 test pits installed during the TCRA at Rocket Ridge.

The vertical extent of debris encountered at each of test pits along the western, eastern and southern boundaries was approximately three (3) feet. The one test pit within the center of the main dump was halted after three (3) feet as previously mentioned; however debris was still present at this depth for this location.
Although the test pits showed the debris extended to a maximum of 3-feet below ground surface, it must be noted that this represents the vertical extent along the edges of the site. The middle region of the main dump area protrudes outward forming a well defined mound of the piled debris that extends the entire length of the slope. The mound ranges in height from one (1) foot at the top of the slope to four (4) feet above the eastern and western perimeter boundaries. Survey Report #4 provides an overview of the elevation contours depicting the mound feature within the main dump area.

Based upon the average depth to the bottom of the debris pile as determined by the test pits along the perimeter of the main dump (i.e., 3-feet) compared to the average height of the mounded debris that exists within the main dump area (1 to feet 4-feet above grade), it is estimated that the average depth of material within the main dump is approximately six (6) feet. To that end, given the size of the main dump area (i.e., 10,800 sq. feet) it is estimated that there is approximately 500 cubic yards of contaminated material that will need removed from the main dump area during future removal operations. Survey Report #5 in Appendix H provides an

overview of the surveyed limits of the main dump area along with a summary of the volume calculations using information obtained during the MEC and MD density survey operations.

2.7.2 Excavated Soil Sampling

The approved Work Plan called for collecting three (3) discrete samples of the hand excavated soils from each of the 9 anomaly investigations (27 samples total). All samples were to be analyzed for the RVAAP full suite, perchlorates and phosphorous. However, based on a site visit conducted by the Ohio EPA on Aug 6, 2009, it was recommended that the dump materials be sampled for waste characterization analysis as information obtained from this type of sampling would better assess the nature of the material (i.e., haz/non-haz constituents) for scoping the future RRA MRS removal operations. In order to ensure that a representative cross section of the material was captured for analysis, one discrete sample was collected from the top of the slope of the main dump area (Sample ID RR1-AA-Pit05-005) and the second sample was collected near the bottom of the main dump area (Sample ID RR1-AA-Pit09-001). Each sample was analyzed for full TCLP, explosives, propellants, pH, ignitability, and reactivity (cyanide and sulfide). The sample from near the top of the slope showed elevated concentrations (i.e., hazardous) for both lead and cadmium. The sample from the bottom of the slope indicates this material is non-hazardous in nature.

A copy of the e-mail correspondence regarding the TCRA sampling modification is provided in Appendix I. A copy of the laboratory sample reports along with a summary table is provided in Appendix J. Figure 5 in Appendix B shows the locations of the two waste characterization samples collected from the RRA MRS.

2.8 ACCESS ROAD IMPROVEMENTS TO THE RRA MRS

Following completion of the MEC and MD Density Survey operations PIKA conducted the following road improvements from Aug 17th to Aug 19th, 2009:

- Re-graded and installed 304 gravel along the ODA2 access road from the main gate to the intersection of Rocket Ridge Road (approximately 1040 feet long by 15 feet wide). See Figure 6 in Appendix B.

- Scraped leaves and organic soil from the extension of the ODA2 access road known as Rocket Ridge Road (including cul-de-sac) to a width of 15 feet; laid down a geo-textile fabric with a minimum of 300-lb tensile strength and installed a six (6) inch layer of 304 gravel. See Figure 6 in Appendix B.

- Compacted all gravel using a vibratory roller.

- 19 August 2009 RVAAP Facility Manager and CELRL representative inspected and accepted access road improvements.

Photo documentation of the access road improvement operations are provided in Appendix C.

2.9 SITE RESTORATION

During the site visit from Ohio EPA on 6 August 2009 it was decided that the excavated soils from the 8 test pits should be replaced back into to the holes for removal during subsequent Phase II removal operations (i.e., instead of containerizing for subsequent handling and disposal under a separate contract as described in the approved Work Plan). As such, each test pit was backfilled and graded to ensure positive drainage following completion of the TCRA field operations on 24 August 2009. Due to the very limited intrusive operations conducted during the TCRA at the RRA (i.e., only test pits), no other site restoration activities were required. A copy of the e-mail correspondence documenting the change in technical approach relative to the excavated soils from the test pits is provided in Appendix I.

2.10 CONCLUSIONS

The objectives of TCRA at the RRA MRS were to mitigate or abate the immediate explosive hazards, investigate the approximate nature, extent, and volume of the MEC and MD and to prepare a RAR to aid in scoping future removal actions at

Rocket Ridge. In addition, road improvements were required within ODA2 to facilitate site access to Rocket Ridge during future site operations.

The defined objectives were achieved through completion of the TCRA field activities from 13 July to 24 August 2009 as described in Section 2.0. A summary of conclusions and findings from the TCRA at the RRA MRS are summarized below:

1. Through investigations conducted by the PIKA UXO personnel it was determined that none of the three 500-lb bombs were fuzed. Large pieces of bomb fragments were unearthed at two of the locations while an almost fully intact body of a bomb (empty) was unearthed at the third location. At the completion of the investigation, all resultant bomb remnants were inspected and determined to be free of explosives hazards. The remnants were left in place for removal during planned Phase II removal operations under a separate contract.

2. The explosive hazard associated with the fuzed and fired 105-mm HE Projectile present at the site was eliminated by conducting the specified BIP operations. The munition was successfully blown-in-place using sandbag mitigation engineering controls as specified in the TCRA ESS. The PIKA SUXOS confirmed that BIP of the 105-mm HE Projectile resulted in a high order detonation.

3. The MEC and MD density survey operations verified that the RRA MRS is comprised of two distinct areas. The first area is the main dump portion and second is the white phosphorus contaminated area. The main dump area contains various sized projectiles, fragments and pieces of projectiles, fuzes, black stained soils, a littering of burster tubes, booster cups, deteriorated wooden crates and mixing pots as well as two heavily concentrated areas of munitions primers and Point Initiating Base Detonating (PIBD) fuzes. The lateral extent of debris associated with this portion of the site extends to a maximum of 40 feet across the top of the slope (east & west) and 45 feet down the slope (south to north). The white phosphorus area is comprised of

tail fin assemblies and fragments from M19 white phosphorus rifle grenades, however based on the white phosphorus rifle grenade incident that occurred on June 18, 2007, it is very likely that intact M19 white phosphorus grenades are co-mingled with the debris in this portion of the RRA. The area is roughly oval in shape and is approximately 56 feet long and 36 feet wide at its extremes. Debris from the area; including visible white phosphorus extends approximately 15 feet into Sand Creek from the shore line.

Based on information obtained from test pits, survey data and visual observations it is estimated that the average depth of debris within the main dump area is approximately 6 feet and the average depth of material within the white phosphorus contaminated is approximately 4-feet. Based on these depths and the defined lateral extents of each area it is estimated that approximately 500 cubic yards of contaminated materials it will need removed from the main dump area during future removal operations and approximately 270 cubic yards of material will need removed from the white phosphorus contaminated area.

4. Two discrete soil samples were collected from the main dump area at RRA for waste characterization analysis, including TCLP, reactivity, corrosivity, ignitability, explosives and propellants. One sample was collected from the upper portion of the slope and one was collected from the bottom portion. The sample collected from the upper portion revealed hazardous concentrations of lead and cadmium along with low level explosives and propellants. Low levels of explosives and propellants were also detected in the sample collected from the lower region of the main dump; however there were no hazardous concentrations of contaminants detected in this sample. PIKA estimates that the co-mingling of material during future removal operations will result in approximately 90% of the excavated soil/debris being disposed of as non-hazardous waste and approximately 10% will be hazardous.

5. Following completion of the TCRA field operations, road improvements were conducted within ODA2 along the main access road and the extension road leading to the RRA MRS known as Rocket Ridge Road. Road improvements included re-grading the existing roadways to facilitate installation of geo-textile fabric and new gravel cover. All installed gravel was compacted using a vibratory roller. The access road improvement were inspected and accepted by the RVAAP Facility Manager and CELRL on 19 August 2009.

APPENDIX A

Scope of Work

SCOPE OF WORK (SOW)
FOR THE TIME CRITICAL REMOVAL ACTION (TCRA)
AT THE ROCKET RIDGE AREA OF OPEN DEMOLITION AREA #2 (ODA2)
RAVENNA ARMY AMMUNITION PLANT (RVAAP)
RAVENNA, OHIO
9 MARCH 2009

1. General Requirements:

1.1. The purpose of this SOW is to describe deliverables for Time Critical Removal Action and munitions and explosives of concern (MEC) and munitions debris (MD) survey at the area of Open Demolition Area #2 (ODA2) known as Rocket Ridge.

1.2. The objective of this project is to mitigate or abate the immediate explosive hazards, investigate the approximate nature, extent, and volume of the MEC and MD and to prepare a Removal Action Report (RAR) that will describe the action taken to remove the threat to human health and the environment. The report will also present data from the MEC and MD survey to aid in scoping future removal actions at Rocket Ridge. In addition, some road improvements and vegetation removal will be required to facilitate access to the site.

1.3. Rocket Ridge is a steep escarpment approximately 500-feet long and 25-feet high located adjacent to Sand Creek within the ODA2 (Army Environmental Database-Restoration Number RVAAP-004-R-01). Attachment 1 illustrates the location of Rocket Ridge.

The Rocket Ridge slope was likely used for the disposal of demilitarized munitions, although not all munitions appear to have been completely demilitarized. Munitions-related items that could be identified in June 2007 by PIKA International (PIKA), RVAAP's Unexploded Ordnance (UXO) subcontractor, included 75-millimeter and 105-millimeter projectiles, booster cups, three 500-pound bombs, white phosphorus rifle grenades, fuzes, and burster tubes. It appears that the munitions were transported from the demolition site to the Rocket Ridge Area of ODA2 and dumped at the top of the slope. Sand Creek flows in an eastward direction along the northern boundary of Rocket Ridge, at the toe of the slope. Due to the steep slope of the disposal area and the stream bank erosion resulting from high water events, some of the munitions materials have been deposited into Sand Creek. On 18 June 2007, a rifle grenade containing white phosphorus functioned as designed on the slope of the Rocket Ridge Area of ODA2. The Incident Report attributed the cause of the explosion to a corroded white phosphorus grenade that might have been overturned by an animal, which exposed the white phosphorus to air, resulting in its auto-igniting, which heated the grenade until the internal burster exploded. No injuries resulted from the incident.

1.4. The proposed project will consist of preparing a Project Management Plan, Project Work Plan (including a site specific Safety and Health Plan, Accident Prevention Plan, and an investigation-specific Quality Assurance Project Plan addendum), Explosives Safety Submission Plan, and a Public Involvement Plan; making road improvements and vegetation removal necessary to access the site; elimination of immediate explosives hazards (i.e. three 500-lb bombs and one 105 mm projectile) via removal and/or blow-in-place (BIP); completing an instrument-assisted MEC and MD survey within the Rocket Ridge area using non-intrusive and avoidance techniques; digging test pits; submitting a comprehensive Removal Action Report describing the action taken to remove the immediate threat to human health and the environment as well as describe the findings of the investigation and evaluating possible contamination impacts on Sand Creek during remediation.

1.5. All work will comply with the RVAAP Plant Protection Plan.

1.6. The proposal will specify the principle costs and include supporting cost calculations to complete the SOW. See Attachment 5 for example proposal.

1.7. Work will be performed in accordance with (IAW) the following document(s):

Ohio Environmental Protection Agency (Ohio EPA) Director's Final Findings and Orders (DFFO) for RVAAP, dated June 10, 2004 (Ohio EPA 2004)

DOD Ammunition and Explosives Safety Standards DOD 6055.9-STD.

Ohio Standard's for Stormwater Management and Land Development and Urban Stream Protection 2006

1998 Memorandum of Agreement (MOA) for the Ravenna Army Ammunition Plant (RVAAP) Among Headquarters, U.S. Army Industrial Operations Command (IOC), The United States Property and Fiscal Officer (USP&FO) for Ohio, and the Ohio Army National Guard (OHARNG)

2001 Amendment 1 to the Memorandum of Agreement (MOA) for the Ravenna Army Ammunition Plant (RVAAP) Among Headquarters, U.S. Army Industrial Operations Command (IOC), The United States Property and Fiscal Officer (USP&FO) for Ohio, and the Ohio Army National Guard (OHARNG)

IOC Pamphlet 385-1 Classification and Remediation of Explosive Contamination

01 AUGUST 2004 Pamphlet No. 75-1-2 - *Munitions and Explosives of Concern (MEC) Support during Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities,* Department of the Army, U.S. Army Corps of Engineers

December 3, 2004 Number 4140.62 - Department of Defense Instruction -*Management and Disposition of Material Potentially Presenting an Explosive Hazard (MPPEH)*

March 2001 Facility-Wide Sampling and Analysis Plan for Environmental Investigations at the Ravenna Army Ammunition Plant, Ravenna, Ohio

2005 Munitions and Explosives of Concern (MEC) at the Ravenna Army Ammunition Plant (RVAAP) – Notification Procedures (Ohio EPA)

February 1996 Facility-Wide Safety and Health Plan (SAIC)

April 9, 2004 Engineering Pamphlet (EP)110-3-8 (USACE)

EP 385-1-95a, Basic Safety Concepts and Considerations for Munitions and Explosives of Concern (MEC) Response Action Operations, 27 Aug 2004 with Errata Sheets 1 and 2

ER 385-1-95, Safety and Health Requirements for Munitions and Explosives of Concern (MEC) Operations, 30 March 2007, with Errata Sheet 1.

EM 1110-1-4009, Military Munitions Response Actions, June 2007, with Errata Sheets 1, 2, and 3.

EP 1110-1-18, Military Munitions Response Process, 3 April 2006, and Interim Guidance Document 06-04 which implements this document.

Approved Explosive Safety Submission(s) and Amendments

In case of conflict between reference documents and provisions contained in this SOW, necessary Government parties will resolve opposing specifications.

1.8. Contractor will exercise care near existing groundwater monitoring wells to ensure that no damage to such wells occurs. Damage to these wells will be the responsibility of the contractor to either repair or replace IAW regulations or at the discretion of RVAAP Facility Manager and COR.

1.9. Safety and Health Program. The contractor shall ensure that its subcontractors, suppliers, and support personnel follow all safety and health provisions established in the approved Work Plan and Explosives Safety Submission Plan. The Government reserves the right to stop work under this contract for any violations at no additional cost. The Government will verify that corrective action has been implemented prior to the contractor continuing performance under the contract. All personnel performing onsite activities shall participate in an ongoing medical surveillance program meeting the requirements of 29 CFR 1910.120. The medical examination protocols and results shall be overseen by a licensed physician who is certified in Occupational Medicine by the American Board of Preventive Medicine or who by necessary training and experience is board eligible.

1.10. Quality Management. The contractor is responsible for the control of product quality and for offering to the Government for acceptance only those products/services that conform to the contractual requirements.

2. Requirements:

2.1. All tasks will be accomplished IAW the provisions contained in this SOW.

2.2. All physical work will be accomplished within 6 months after the delivery order award. Contract closeout will take place as soon as possible after final acceptance by the contracting officer.

2.3. The contractor will prepare weekly progress reports during field activities in a form approved by the USACE COR. Activities and progress will be documented by photographs and/or video. An electronic copy will be sent to each of the project team members.

2.4. The contractor is responsible for complying with all federal, state, local, Army, and installation specific rules, laws, regulations, and policies pertaining to environmental, human health and safety, and security issues.

2.5. Deliverables and Document Format. All documents must be produced with at least preliminary draft, draft, and final versions. The USACE, through the COR, will receive preliminary draft documents and will provide comments to the contractor within twenty business days. Once preliminary draft comments are addressed, all remaining Army and regulatory stakeholders will review and comment upon the draft and final documents concurrently. The contractor shall ensure that review and response periods are consistent with the applicable regulatory drivers, including the DFFO. All documents shall be identified as draft until completion of stakeholder coordination, when they will be approved and finalized. One copy of the final document shall be placed in both the project repositories and Administrative Record (for CERCLA documents).

All documents except preliminary drafts shall be provided in electronic format to SAIC for posting to the Ravenna Environmental Information Management System (REIMS).

Draft documents may be reviewed concurrently by the USACE and other Stake Holders at the discretion of the USACE.

2.6. All documents shall be formatted to comply with RVAAP document formatting guidelines. Formatting guidelines can be found online at: http://www.rvaap.org/docs/pub/Formatting_Guidelines.pdf.

2.7. Deliverables. All documents shall be submitted in Preliminary Draft, Draft Report, and Final Report. The number of documents and their distribution can be found below.

This subject to change if the USACE completes concurrent reviews with other Stake Holders. This will be done at the discretion of the USACE.

2.7.1. **Preliminary Draft Report.** The contractor shall prepare and forward all Preliminary Draft Reports as follows:

Organization	Number of Paper Copies	Number of Electronic Copies
Corps of Engineers – Louisville District	2	1
RVAAP	1	1

2.7.2. **Draft Report.** The contractor shall prepare and forward all Draft Reports as follows:

Organization	Number of Paper Copies	Number of Electronic Copies
Corps of Engineers – Louisville District	2	1
RVAAP	3	3
US Army Environmental Center	1	1
Ohio EPA	2	1
Ohio Army National Guard	1	1
BRAC HQ	0	1
SWDO	1	1

2.7.3. **Final Report.** The contractor shall prepare and forward the Final Report as follows:

Organization	Number of Paper Copies	Number of Electronic Copies
Corps of Engineers – Louisville District	2	1
US Army Environmental Center	1	1
Ohio EPA	2	1
Ohio Army National Guard	1	1
US Army Center for Health, Promotion and Preventative Medicine	1	1
REIMS	1	1
RVAAP	3	3
BRAC HQ	0	1
SWDO	1	1

2.8. **Task 1: Document Preparation**

2.8.1. Prepare and submit a Project Management Plan (PMP); a Project Work Plan (PWP) which shall include a Site Specific Safety and Health Plan, Accident Prevention Plan, and an investigation-specific Quality Assurance Project Plan addendum; an Explosives Safety Submission (or Amendment to an existing ESS) for MEC and MD investigation, removal, and blow-in-place (BIP).

2.9. **Task 2: Access Road Improvement**

2.9.1. Lay down three inches of 304 gravel on Demo Area 2 Road from Newton Falls Road to the gate. This section of road is approximately 1,040 ft long and 15 ft wide.

2.9.2. Fill potholes with 304 gravel along Demo Area 2 Road from the gate to the intersection of Rocket Ridge Road.

2.9.3. Scrape leaves and organic soil from Rocket Ridge Road (including cul-de-sac) to a width of 15 ft. After organic material has been removed, lay down a geo-textile with a minimum tensile strength of 300 lbs. and top with a 6 inch layer of 304 gravel. The length of this section of road is approximately 1,000 feet.

2.9.4. Compact all gravel with a vibratory roller.

2.10. **Task 3: Vegetation Removal**

2.10.1. Remove vegetation as needed to facilitate access for all operations.

2.11. **Task 4: Public Involvement**

2.11.1. The contractor shall coordinate and provide Public Affairs and Community Relations support for this project. All Public Affairs and Community Relations activities must be coordinated with and approved by the RVAAP Facility Manager and the COR.

2.11.2. The contractor shall produce a project-specific public involvement plan. This plan shall be designed to notify the public of work being done at Rocket Ridge emphasizing the BIP scenario. The plan shall be an amendment to the current RVAAP Community Relations Plan. The contractor shall adequately notify the public through local media outlets and public meetings as needed and approved by the RVAAP Facility Manager and the COR. The contractor shall coordinate with USACE Public Affairs Office (PAO).

2.12. **Task 5: Determine if 500-lb Bombs are Fuzed**

2.12.1. Determine if any of the 500-lb bombs are fuzed and/or unacceptable to move.

2.12.2. If the 500-lb bombs are found to be fuzed and/or unacceptable to move, the contractor shall provide recommendations on how to address the munitions.

2.12.3. The stakeholders will come to an agreement on how to address the munitions. This scenario could potentially suspend all activities at Rocket Ridge.

2.13. **Task 6: Blow-In-Place One 105 mm Projectile**

2.13.1. The contractor shall conduct blow-in-place (BIP) operations for the known 105 mm projectile. The contractor must positively identify the projectile prior to any blow-in-place procedures. The contractor shall employ protective works to protect the projectile while investigating the 500-lb bombs and during the blow-in-place procedures. Depending on the proximity of the 105 mm projectile to the three 500-lb bombs, the contractor may need to prepare for potential sympathetic detonation of all four items. Coordination with USACE PGH and Ohio EPA will be required due to potential impacts to Sand Creek. BIP operations can only be done after the RVAAP Facility Manager and the COR have determined that all necessary public affairs activities have been completed.

2.14. **Task 7: Removal of Immediate Explosive Hazards**

2.14.1. If the 500-lb bombs are found not to be fuzed and acceptable to move, then remove the items and store in the designated RVAAP storage igloo. If possible, the bombs shall be removed before any BIP operations are conducted.

2.15. **Task 8: Conduct an Instrument-Assisted MEC and MD Density Survey of the Rocket Ridge Area**

2.15.1. The contractor shall use an all metals detector and a GPS device to determine the site boundaries and extent of contamination. The total area is assumed to be approximately 1 acre.

2.15.2. The investigation shall assess the potential explosive hazards known to be present at the site, including an area concentrated with white phosphorus rounds.

2.15.3. Investigate the area containing white phosphorus rounds, and other areas with visible contamination, to estimate the approximate nature and extent of contamination and level of effort required for safe removal of these items.

2.15.4. Dig nine test pits at locations selected by the contractor to determine the approximate depth of contamination. The test pit locations should be spaced such that they can be assumed to be representative of the total area. All necessary safety precautions shall be employed during excavation of the test pits. The contractor shall record by video the test pit digging operations.

2.15.5. Three discrete grab samples from each set of test pit excavated soil (twenty-seven samples total) shall be tested for the RVAAP full suite plus perchlorates and phosphorus.

2.15.6. Soils excavated from the test pits shall be stored on site in an approved container and location in accordance with all applicable rules, laws and regulations. Disposal of the soil shall take place under another contract action.

2.15.7. Contractors shall backfill with clean soil where test pits have been dug immediately after investigation is complete to prevent possible problems such as slope failure or leachate outbreaks. Proposed backfill material must be tested for the RVAAP full suite.

2.15.8. The general area of investigation shall be staked or otherwise identified for safety purposes.

2.15.9. The contractor shall define the boundaries of the Rocket Ridge based on the following criteria:

North – Will be defined by the south bank of Sand Creek.
South, East, West – Will be defined where a significant decrease of MEC/MD density is observed. The contractor shall coordinate with the USACE for final approval of the Rocket Ridge boundaries.

The boundaries shall be mapped and described based on the area determined by the GPS assisted analog geophysical investigation.

2.16. **Task 9: Prepare a Removal Action Report (RAR).**

2.16.1. The report shall describe, in detail, the action taken to remove the immediate threat to human health and the environment (i.e. three 500-lb bombs and one 105mm projectile).

2.16.2. The report shall include detailed documentation of all MEC, MD, and subsurface anomalies, including identification of the items (if possible), a detailed description, photographs (MEC and MD) and GPS locations.

2.16.3. The report shall include a georeferenced map of Rocket Ridge with clearly defined boundaries. The map should show all locations of visually observed MEC and MD, test pit locations, anomalous areas, and single anomalies overlaid on an existing GIS map of the installation. Existing GIS maps are available at http://team2.rvaap.org/Login.asp. Contact the USACE COR to gain access to the site which is password protected.

2.16.4. GIS Data – All GIS Information shall be presented on maps and submitted to the RVAAP Information Manager in electronic format. Drawings should be

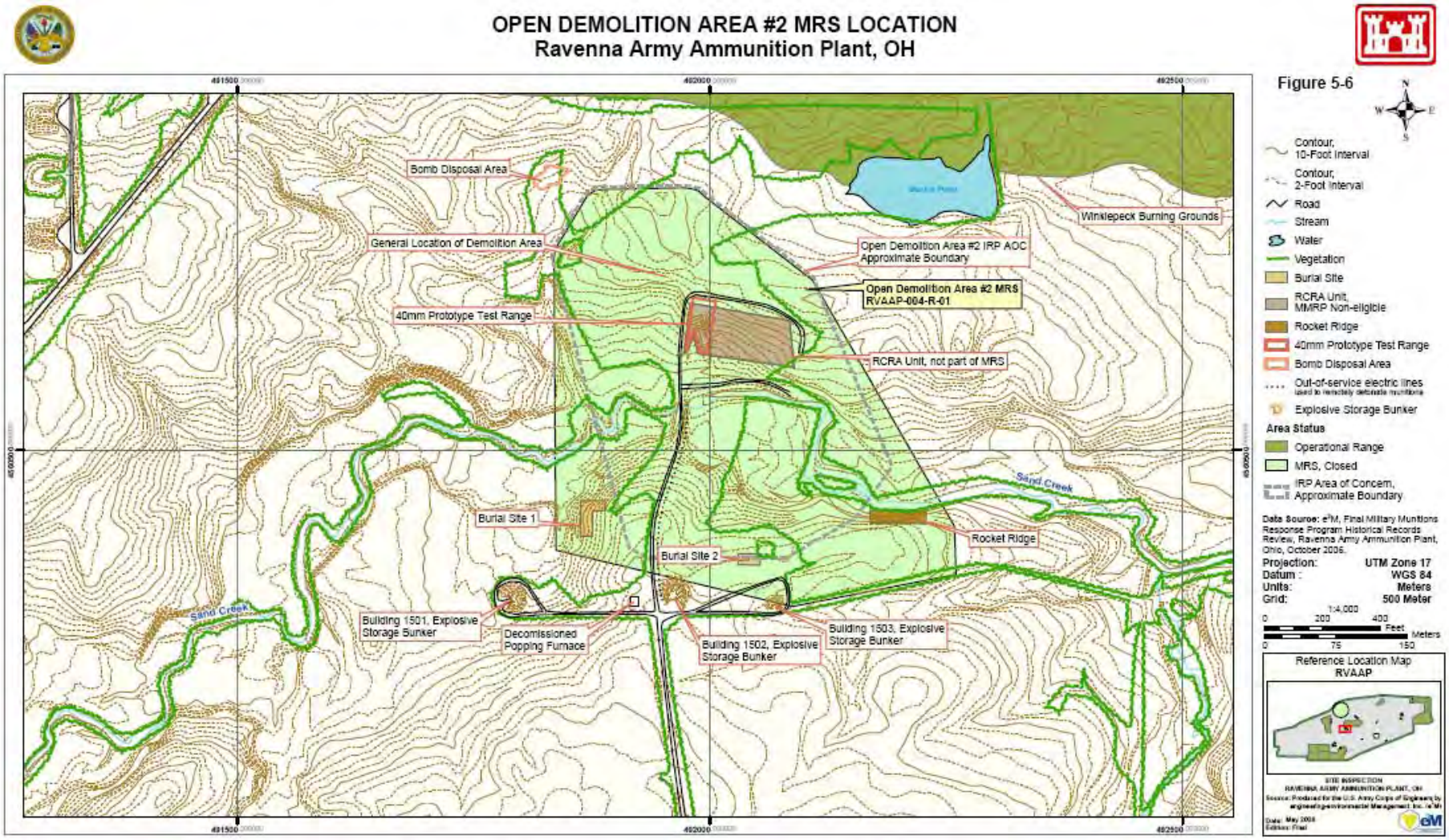
submitted in PDF format. Maps should be submitted in an ArcView compatible format. Map formats such as ESRI shape files, ArcInfo coverages, or AutoCad drawings (.DWG files) are acceptable. Electronic files containing the maps or drawings should be submitted on CDs.

2.16.5. The final acceptance of the report will take place upon receipt by the contractor of written approval from the designated Louisville District COR.

2.17. Schedule

Identified Tasks	**Duration Days**
NTP	1
Conduct All Public Affairs and Community Relations Activities	15 days from NTP
Submit Pre-Draft Work Plan, ESS, and PIP	15 days from NTP
Begin Road Improvement and Vegetation Removal	79 days from NTP
Begin Field Work	83 days from NTP
Submit Pre-Draft Removal Action Report	97 days from NTP

ATTACHMENT 1



APPENDIX B

Figures

Figure 1 – General Location and Orientation of RVAAP

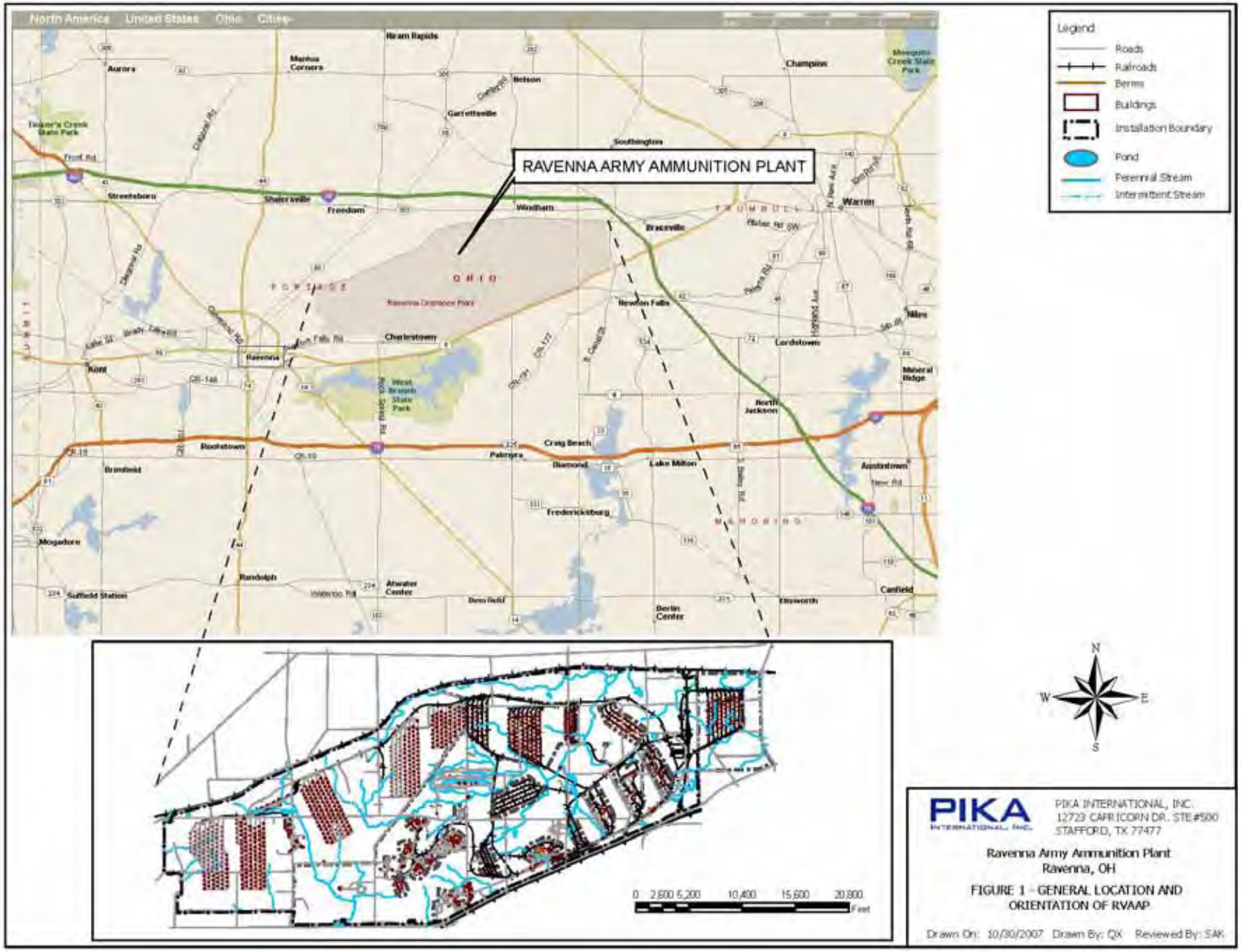
Figure 2 – RVAAP Facility Map and Location of the Rocket Ridge Area within RVAAP

Figure 3 - Location of Munitions Response Site within ODA2

Figure 4 - Location of 500-lb Bombs at Rocket Ridge

Figure 5 – Waste Characterization Sample Locations

Figure 6 - ODA2 Access Road Improvements



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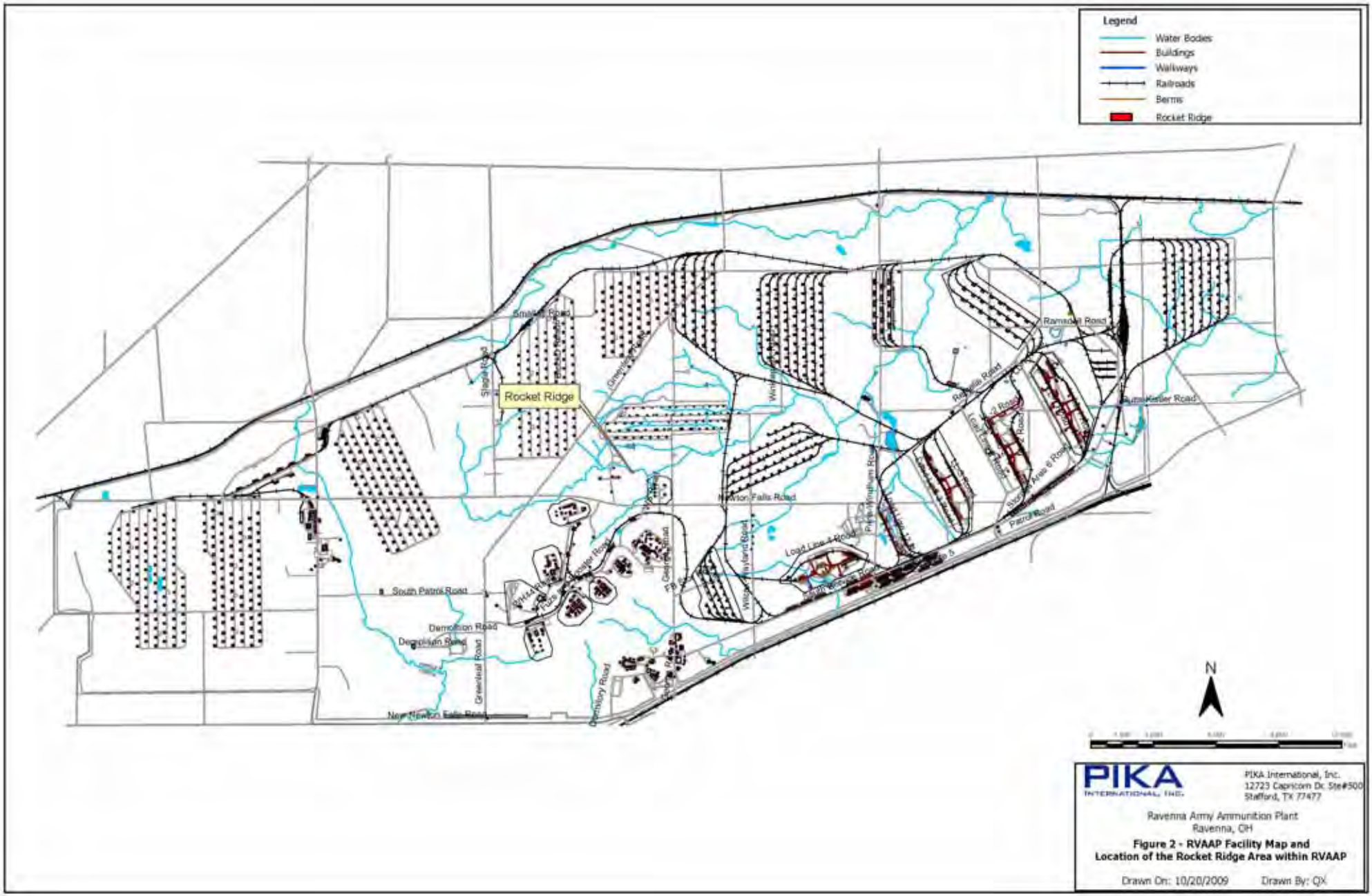
12723 CARRICORN DR. STE#500
STAFFORD, TX 77477

Ravenna Army Ammunition Plant
Ravenna, OH

FIGURE 1 - GENERAL LOCATION AND ORIENTATION OF RVAAP

Drawn On: 10/30/2007 Drawn By: QX Reviewed By: SAK



PIKA INTERNATIONAL, INC.

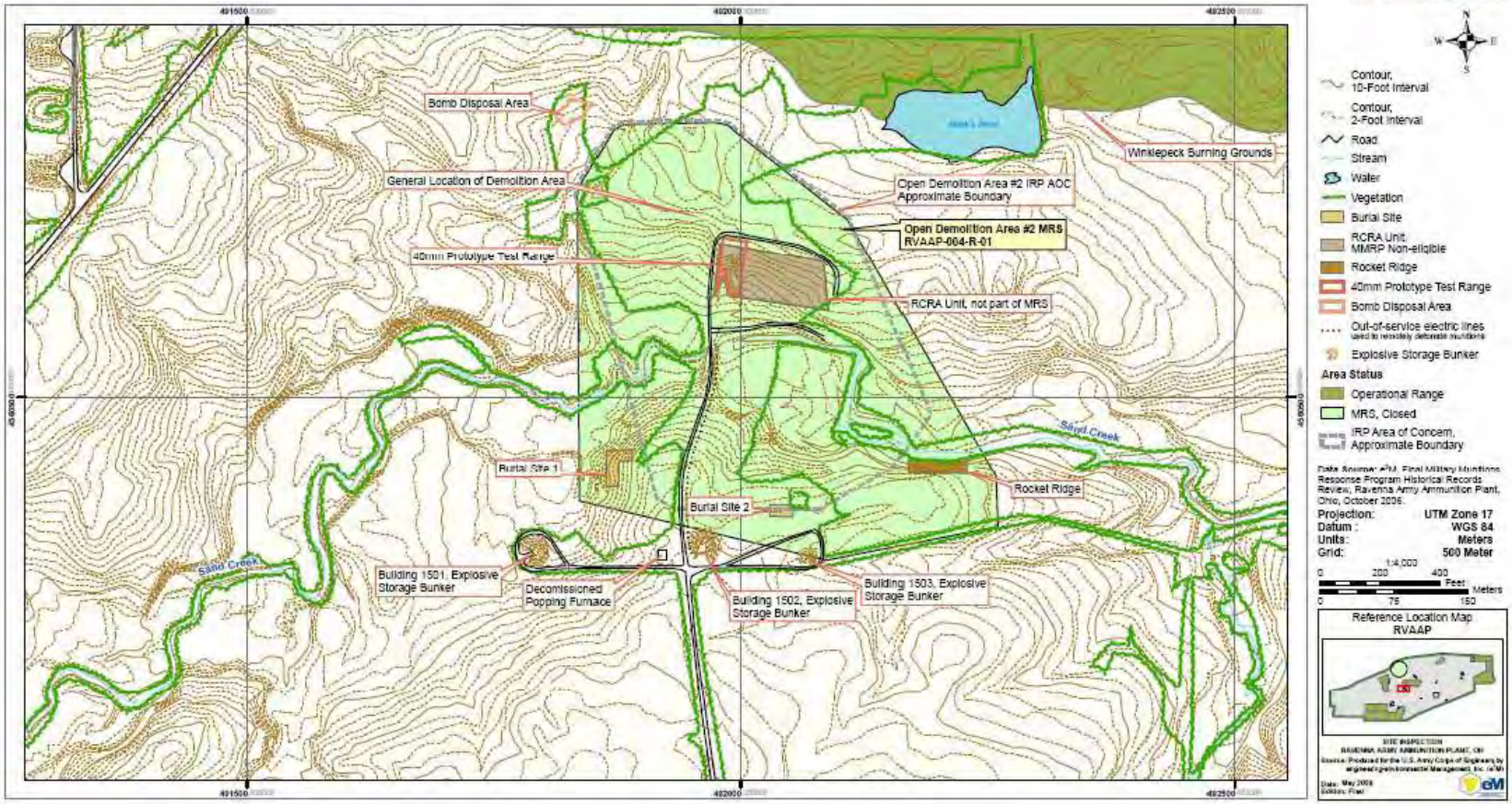
PIKA International, Inc.
12723 Capricorn Dr. Ste#500
Stafford, TX 77477

Ravenna Army Ammunition Plant
Ravenna, OH

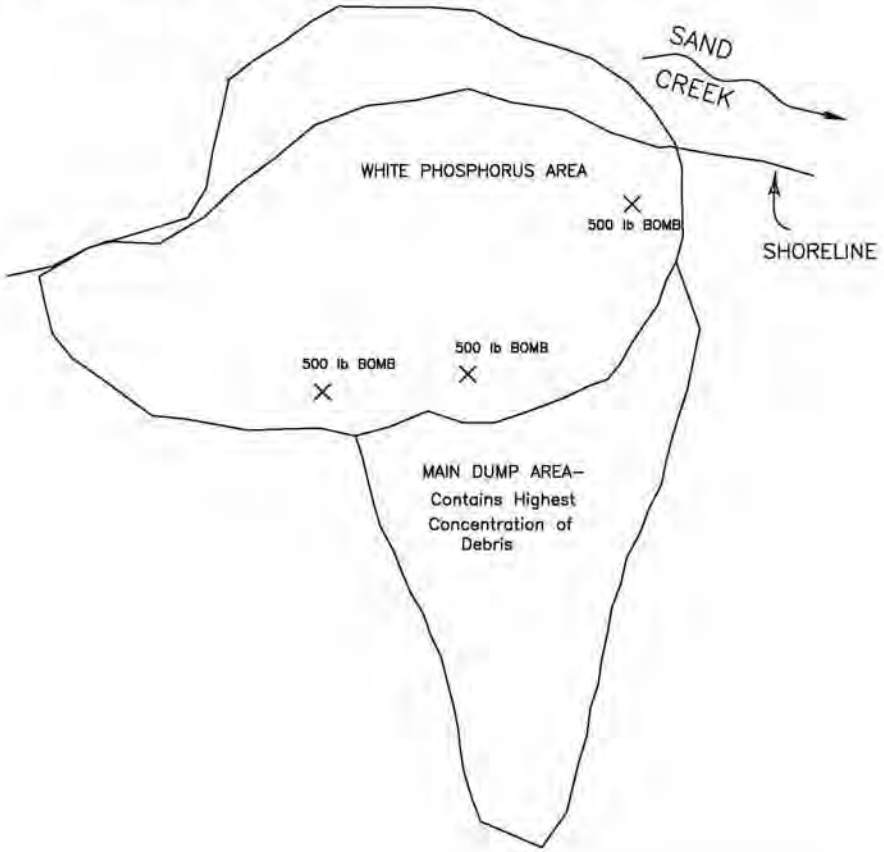
Figure 2 - RVAAP Facility Map and Location of the Rocket Ridge Area within RVAAP

Drawn On: 10/20/2009 Drawn By: QX

Figure 3 – Location of Munitions Response
Site within Open Demolition Area 2 (ODA2)
Ravenna Army Ammunition Plant
Ravenna, OH



ROCKET RIDGE FIGURE # 4 (LOCATION OF 500lb BOMBS)
RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO PORTAGE COUNTY
PREPARED FOR PIKA INTERNATIONAL INC.



0 10 20

BAR SCALE IN FEET

CAUTION: IF THIS BAR DOES NOT MEASURE 2" LONG, THEN THIS DRAWING IS NOT AT THE STATED SCALE.

STATE OF OHIO
DONALD TROCCHIO
6445
REGISTERED SURVEYOR

AUGUST 11–18, 2009

PH 330-296-2375

DON TROCCHIO

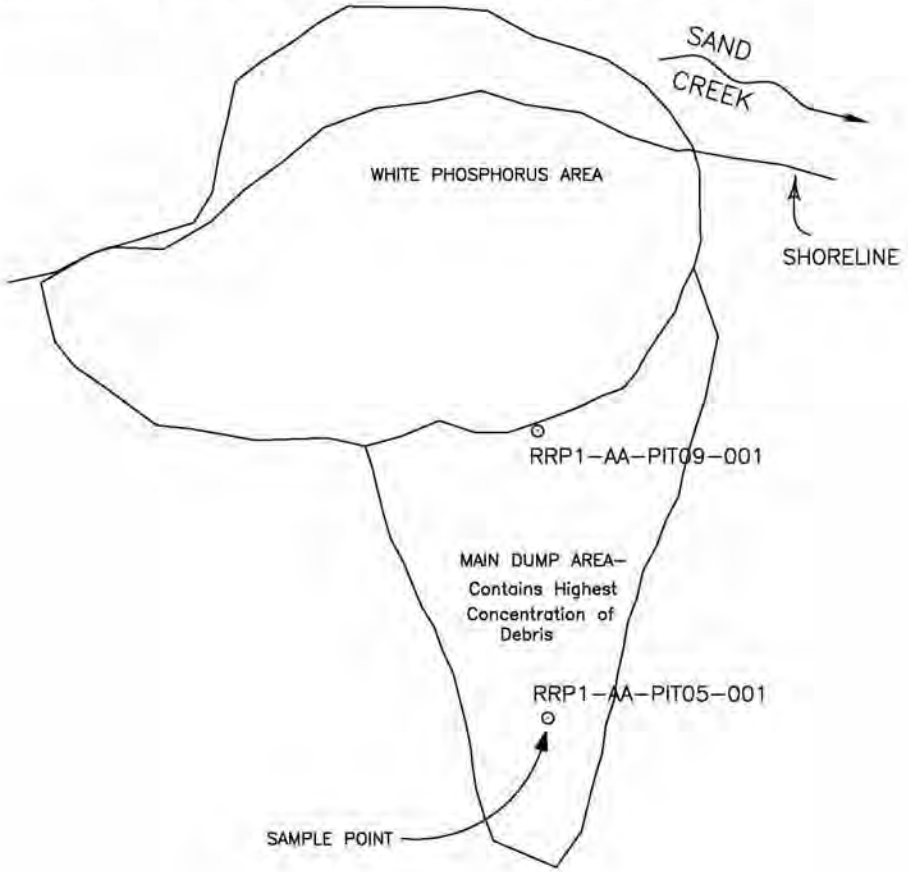
5485 McCORMICK ROAD
P.O. BOX 528
RAVENNA, OH 44266

REGISTERED SURVEYOR NO.6445

DRAWING NOTES

1. BEARINGS ARE GRID NORTH, NAD83 OHIO STATE PLANE RECTANGULAR COORDINATES, NORTH ZONE ORIGINATING FROM RAV 3 DISC IN CONC.
   N561955.072 E2357760.413 ELV 1034.46
2. COORDINATES SHOWN ARE GRID
3. COMBINED SCALE FACTOR USED 0.999895
4. YOU MAY DOWNLOAD THE FREE UTILITY CORPSCON AT http://crunch.tec.army.mil/software/corpscon/corpscon.html TO CONVERT COORDINATES TO ANOTHER MAP PROJECTION

ROCKET RIDGE FIGURE# 5 (WASTE CHARACTERIZATION SAMPLE LOCATIONS)
RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO PORTAGE COUNTY
PREPARED FOR PIKA INTERNATIONAL INC.



0 10 20

BAR SCALE IN FEET

CAUTION: IF THIS BAR DOES NOT MEASURE 2" LONG, THEN THIS DRAWING IS NOT AT THE STATED SCALE.

STATE OF OHIO
DONALD
TROCCHIO
6445
REGISTERED
SURVEYOR

AUGUST 11-18, 2009

PH 330-296-2375

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5485 McCORMICK ROAD
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DRAWING NOTES

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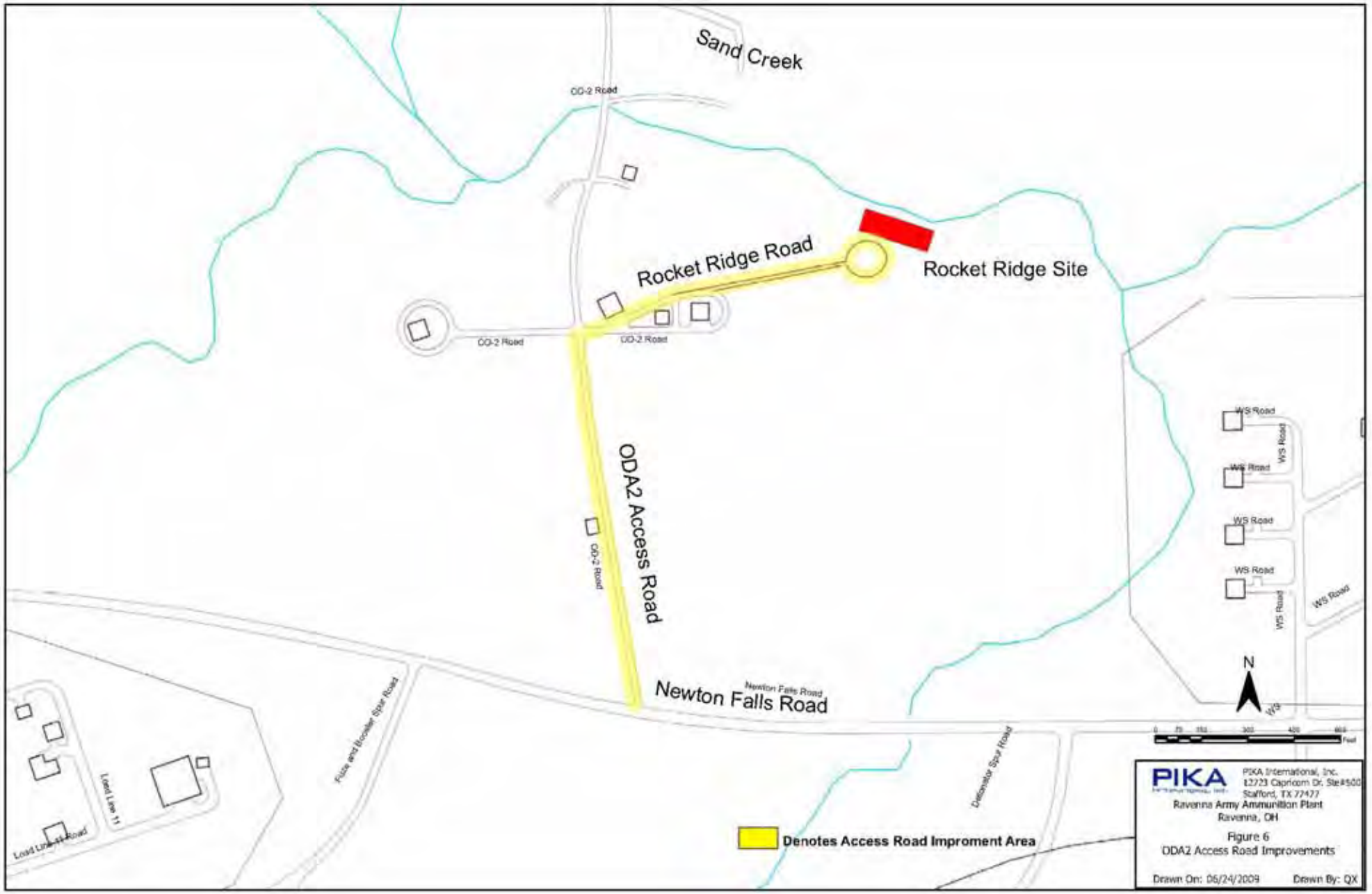

Sand Creek
CO-2 Road
Rocket Ridge Road
Rocket Ridge Site
CO-2 Road
CO-2 Road
ODA2 Access Road
CO-2 Road
WS Road
WS Road
WS Road
WS Road
WS Road
WS Road
WS Road
N
Newton Falls Road
Newton Falls Road
Fuze and Booster Spur Road
Load Line 11
Load Line 11 Road
Detonator Spur Road
Denotes Access Road Improment Area
PIKA
PIKA International, Inc.
12723 Capricorn Dr. Ste#500
Stafford, TX 77477
Ravenna Army Ammunition Plant
Ravenna, OH
Figure 6
ODA2 Access Road Improvements
Drawn On: 06/24/2009
Drawn By: QX

APPENDIX C

Rocket Ridge Weekly Reports & Photo Documentation

WEEKLY REPORT

Prime Contract No:	W912QR-09-P-0033		**Report No.**	1
PIKA Project #:	09-08-134		**Date:**	07-13-09 to 07-17-09
Project:	TCRA at the Rocket Ridge Area of Open Demolition Area #2, Ravenna Army Ammunition Plant, Ravenna, Ohio			

Summary of Activities

- Mobilized personnel and equipment to site during the week of 7/13.
- Conducted kickoff meeting on 7/15 (sign-in and call-in sheets are attached at to this report).
- Began brush cutting on 7/15.

Others:

- Conducted daily safety briefings and site specific training.

Remarks (include directions received from client's representative or regulators, visitors, compliance notices received, pertinent information)

Visitors: Mark Patterson – RVAAP FM and URS

Work Completed:

	This Week	Cumulative to-date
Mobilization	100%	100%
Brush Cutting	42%	42%
	-	-
	-	-
	-	-
	-	-
	-	-
	-	-
	-	-
	-	-
	-	-
	-	-
	-	-
	-	-
	-	-
	-	-

Health and Safety-

Conducted health and safety meetings and task order meetings every morning, prior to commencement of daily activities.

Were there any lost time accidents this week? No [x] Yes [ ].

If "yes", refer attached summary of incident or OSHA report.

Quality Control

Inspections Performed	Non-Conformances	Corrective Action (CA)	Follow-up on CA
Internal site inspection	None	None	Not Applicable

Major Problems and Resolution:

Schedule for Next Week

- Continue brush cutting activities.
- Inspection of 500 lb bombs.

Refer attached **Schedule** for percentage of work completed and projected completion dates.

SUXOS	Lew Kovarik	Site Safety Officer	Mel Lau
Project Manager	Brian Stockwell		

Photo Log

Rocket Ridge before beginning brush cutting operations

RVAAP ROCKET RIDGE AGENDA MEETING
SIGN-IN LOG

JULY 15, 2009

NAME	COMPANY	EMAIL ADDRESS
Sue Boles	PIKA	sboles@pikainc.com
Brian Stockwell	PIKA	bstockwell@pikainc.com
Mel Lau	Pika	MLau@pikainc.com
Christy Esler	RVAAP - VISTA	Christy.esler@us.army.mil
Mark Patterson	RVAAP	mark.c.patterson@us.army.mil
Katie Elgin	OHARNG	katie.elgin@us.army.mil
Glen Beckham	USACE	Glen.beckham@usace.army.mil
MARK NICHTER	USACE	MARK.W.NICHTER@ " "
Derek Kinder	USACE	derek.s.kinder@usace.army.mil
Nat Peters	USACE	nat.peters@us.army.mil
Todd Fisher	OHIO EPA	TFisher@epa.state.oh.us
Allen Sebastian	USACE	Allen.E.Sebastian@usace.army.mil
Jim McGee	RVAAP/Vista	jim.d.mcgee@us.army.mil
SFC REX HUFENBACH	CAMP RAVENNA / OHARNG	rex.hufenbach@us.army.mil

RVAAP ROCKET RIDGE AGENDA MEETING
CALL-IN LOG

JULY 15, 2009

NAME	COMPANY	EMAIL ADDRESS
Doc Holiday	USACE	David.L.Holladay@usace.army.mil
Shahrukh Kanga	PIKA	skanga@pikainc.com
Kate Anthony	PIKA	kanthony@pikainc.com
Srini Neralla	PIKA	sneralla@pikainc.com
Cliff Doyle	USATCES	clifford.doyle@us.army.mil
Nick Stolte	USACE	nicholas.j.stolte@usace.army.mil
Shane Corcoran	PIKA	scorcoran@pikainc.com
Pat Baccum	OHARNG	pat.baccum@us.army.mil
Travis McCoun	USACE	Travis.Mccoun@usace.army.mil
Clint Henker	USACE	Clint.J.Henker@usace.army.mil

WEEKLY REPORT

Prime Contract No:	W912QR-09-P-0033		**Report No.**	2
PIKA Project #:	09-08-134		**Date:**	07-20-09 to 07-24-09
Project:	TCRA at the Rocket Ridge Area of Open Demolition Area #2, Ravenna Army Ammunition Plant, Ravenna, Ohio			

Summary of Activities

- Completed removal of ground level brush and vegetation on 7/22;
- Cleared and marked footpaths to facilitate access to the 500lb bombs and 105mm projectile;
- Transported acceptable to move MEC items encountered during access clearing operations to ECM 1501 for storage (see attached MEC tracking log);
- Collected GPS coordinates of the acceptable to move MEC prior to moving for storage;
- Positioned sandbags at Rocket Ridge in preparation for sandbag mitigation;
- Sent out the Accident Notification Flow Chart and finalized the MEC Demolition/Disposal Notification;
- Notified local emergency services and key personnel that MEC demolition operations will be conducted on 7/29.

Others:

- Conducted daily safety briefings and site.

Remarks (include directions received from client's representative or regulators, visitors, compliance notices received, pertinent information)

Visitors: Mark Patterson (BRAC Facility Manager), Eileen Mohr (Ohio EPA).

Work Completed:

	This Week	Cumulative to-date
Mobilization	100%	100%
Brush Cutting	100%	100%
Evaluation of the three 500 lb bombs	-	-
Removal of Immediate Explosive hazards	-	-
Blow-in-place one 105mm HE Projectile	-	-
MEC and MD Survey Density Survey	-	-
Access road improvement	-	-
Demobilization	-	-

Health and Safety-

Conducted health and safety meetings and task order meetings every morning, prior to commencement of daily activities.

Were there any lost time accidents this week? No [x] Yes [ ].

If "yes", refer attached summary of incident or OSHA report.

Quality Control

Inspections Performed	Non-Conformances	Corrective Action (CA)	Follow-up on CA
Internal site inspection	None	None	Not Applicable

Major Problems and Resolution: None

Schedule for Next Week

- Evaluation of the 500 lb bombs.
- Demolition of 105mm projectile.

Refer attached **Schedule** for percentage of work completed and projected completion dates.

SUXOS	Mel Lau	Site Safety Officer	Lew Kovarik
Project Manager	Brian Stockwell		

Photo Log

View from top of Rocket Ridge following brush clearing operations.

View looking up from the bottom of Rocket Ridge following brush clearing operations.

Pictures showing mixing pots and portion of drum located near the bottom of the slope.

Close up of visible MEC related items along portion of the slope of Rocket Ridge.

Picture showing a close up of the area where one of the 500 lb bombs exists following the vegetation removal operations. The nose of the 500 lb bomb is visible near the center of photo.

Picture showing yellow pins flags installed along the slope marking location of the fuzed 105mm HE projectile.

Picture showing some of the safe to move MEC items encountered during access clearing operations. See attached MEC Tracking Log for listing of items removed to date.

PIKA INTERNATIONAL, INC.

MEC TRACKING LOG

Project: Rocket Ridge TCRA at Ravenna Army Ammunition Plant, Ravenna, OH

Contract: W912QR-09-P-0033

Date	Item Description	Igloo No.	Disposition	GPS COORDINATES
7/21/2009	2 ea 500lb Bombs		Rocket Ridge Awaiting Investigation	
7/21/2009	1 ea 105mm HE Projectile(fuzed & fired)		Rocket Ridge Awaiting Investigation	
7/21/2009	1 ea 75mm HE Projectile (BD fuze, unfired)	1501	Awaiting Demo	N 41.19500 W 81.09337 Elev 1143
7/21/2009	1 ea 90mm Projectile (empty, poss tracer)	1501	Awaiting Demo	N 41.19500 W 81.09337 Elev 1143
7/21/2009	1 ea 75mm APHE Projectile (BD fuze, unfired)	1501	Awaiting Demo	N 41.19493 W 81.09317 Elev 1117
7/21/2009	1 ea 37mm HE Projectile (BD fuze, empty)	1501	Awaiting Demo	N 41.19513 W 81.09309 Elev 1081
7/22/2009	5 ea Bomb Fuzes, 3 ea PD fuzes (T-Bar)	1501	Awaiting Demo	N 41.19522 W 81.09321 Elev 1193
7/22/2009	76 ea PIBD fuzes	1501	Awaiting Demo	N 41.19513 W 81.09309 Elev 1081
7/23/2009	2 ea VT Fuzes	1501	Awaiting Demo	N 41.19514 W 81.09314 Elev 1098
7/23/2009	7 ea PIBD Fuzes	1501	Awaiting Demo	N 41.19513 W 81.09322 Elev 1110
7/23/2009	1 ea T-Bar Fuze	1501	Awaiting Demo	N 41.19515 W 81.09321 Elev 1107
7/23/2009	3 ea 20mm	1501	Awaiting Demo	N 41.19507 W 81.09316 Elev 1077

PIKA INTERNAL SITE QUALITY CONTROL INSPECTION

SITE LOCATION Rocket Ridge **PROJECT NUMBER** 09-08-134

DATE INSPECTED 23 July 09 **INSPECTOR'S NAME** Sue Boles

PIKA ON SITE REP. Lew Kovarik

#	ITEM INSPECTED	YES	NO	N/A
1.	Is Spill Kit available and fully stocked?	X		
2.	Are all waste containers properly stored and labeled?	X		
3.	Have all assigned employees had HAZWOPER training?	X		
4.	Is at least one on site employee trained in First Aid?	X		
5.	Have all on site employees documented that they have read the RVAAP Facility Wide Safety and Health Plan?	X		
6.	Have all on site employees documented that they read the Site Specific Health and Safety Plan?	X		
7.	Have all employees documented that they have read the Site Specific Work Plan?	X		
8.	Are route maps to the local hospital posted in the office trailer?	X		
9.	Can each on site employee explain how to obtain emergency services?	X		
10.	Have all on site employees been briefed on what types of ordinance that might be found on site and what to do if found?	X		
11.	Are adequate communications available on site and are they tested daily?	X		
12.	Are daily tail gate safety meetings conducted and properly documented?	X		
13.	Have all on site employees been issued all required PPE and properly trained in its proper use, cleaning and storage?	X		
14.	Have all assigned employees documented that they have read the Facility Wide Sampling Plan?			X
15.	Have all assigned employees documented that they have read the Site Specific Sampling Plan?			X
16.	Are all of the required meters/instruments on site and are back ups available?	X		
17.	Are appropriate erosion control measures in place?	X		
18.	Are dust control measures being implemented	X		
19.	Are copies of the Work Plan and SSHP available in site trailer?	X		
20	Are all required on site signs properly posted?	X		

WEEKLY REPORT

Prime Contract No:	W912QR-09-P-0033		**Report No.**	3
PIKA Project #:	09-08-134		**Date:**	07-27-09 to 07-31-09
Project:	TCRA at the Rocket Ridge Area of Open Demolition Area #2, Ravenna Army Ammunition Plant, Ravenna, Ohio			

Summary of Activities

- Conducted investigation of the three AN-M Series 500-lb HEGP Bombs. No fuzes present;
- PIKA Senior UXO Supervisor (SUXOS) and UXO Quality Control Specialist (UXOQCS) conducted follow-on inspection of the remnants from all three 500 lb bombs to ensure no visible explosives residue existed. Upon completion, all 3 items originally designated as AN-M 500 lb bombs were determined to be munitions scrap debris; therefore all remnants will be placed and marked with GPS at the Rocket Ridge Area site for final inspection, certification and disposition during Phase II removal operations.
- Conducted Blow-in-Place (BIP) operations on the fuzed 105 mm HE Projectile using sandbag mitigation engineering controls;
- BIP operations confirmed the 105 mm as an HE round -- successful implementation of mitigation techniques and removal of explosive hazard.
- PIKA SUXOS verified the 105 mm projectile BIP operations produced a high order detonation;
- Initiated radiation screening survey to facilitate MEC and MD Density Survey operations;
- Radiation screening was focused along top of slope;
- To date, all screening results are consistent with site background.

Others:

- Conducted daily safety briefings.

Remarks (include directions received from client's representative or regulators, visitors, compliance notices received, pertinent information)

None

Work Completed:

	This Week	Cumulative to-date
Mobilization	100%	100%
Brush Cutting	100%	100%
Evaluation of the three 500 lb bombs	100%	100%
Removal of Immediate Explosive hazards	100%	100%
Blow-in-place one 105mm HE Projectile	100%	100%

Radiation Screening Survey	15%	15%
MEC and MD Survey Density Survey	-	-
Access road improvement	-	-
Demobilization	-	-

Health and Safety-

Conducted health and safety meetings and task order meetings every morning, prior to commencement of daily activities.

Were there any lost time accidents this week? No [x] Yes [ ].

If "yes", refer attached summary of incident or OSHA report.

Quality Control

Inspections Performed	Non-Conformances	Corrective Action (CA)	Follow-up on CA
Internal site inspection	None	None	Not Applicable

Major Problems and Resolution: None

Schedule for Next Week

- Mark boundaries of White Phosphorus contaminated area;
- Complete initial radiation screening survey.

Refer attached **Schedule** for percentage of work completed and projected completion dates.

SUXOS	Mel Lau	Site Safety Officer	Lew Kovarik
Project Manager	Brian Stockwell		

Photo Log

Picture showing all remnants of the first 500 lb bomb that were unearthed and inspected for visible explosive residue.

Pictures showing remnant and close-up view of second 500 lb unearthed and inspected for visible explosive residue.

Picture showing all remnants of the third 500 lb bomb that were unearthed and inspected for visible explosive residue.

Picture showing 105 mm HE projectile inside the sandbag enclosure prior to BIP operations.

Picture showing resultant ground disturbance following BIP operations (high order detonation).

Picture showing Senior Health Physics Technician conducting radiation screening survey along top of slope.

PIKA INTERNAL SITE QUALITY CONTROL INSPECTION

SITE LOCATION Rocket Ridge **PROJECT NUMBER** 09-08-134

DATE INSPECTED 30 July 09 **INSPECTOR'S NAME** Sue Bales

PIKA ON SITE REP. Lew Kovarik

#	ITEM INSPECTED	YES	NO	N/A
1.	Is Spill Kit available and fully stocked?	X		
2.	Are all waste containers properly stored and labeled?	X		
3.	Have all assigned employees had HAZWOPER training?	X		
4.	Is at least one on site employee trained in First Aid?	X		
5.	Have all on site employees documented that they have read the RVAAP Facility Wide Safety and Health Plan?	X		
6.	Have all on site employees documented that they read the Site Specific Health and Safety Plan?	X		
7.	Have all employees documented that they have read the Site Specific Work Plan?	X		
8.	Are route maps to the local hospital posted in the office trailer?	X		
9.	Can each on site employee explain how to obtain emergency services?	X		
10.	Have all on site employees been briefed on what types of ordinance that might be found on site and what to do if found?	X		
11.	Are adequate communications available on site and are they tested daily?	X		
12.	Are daily tail gate safety meetings conducted and properly documented?	X		
13.	Have all on site employees been issued all required PPE and properly trained in its proper use, cleaning and storage?	X		
14.	Have all assigned employees documented that they have read the Facility Wide Sampling Plan?			X
15.	Have all assigned employees documented that they have read the Site Specific Sampling Plan?			X
16.	Are all of the required meters/instruments on site and are back ups available?	X		
17.	Are appropriate erosion control measures in place?	X		
18.	Are dust control measures being implemented			X
19.	Are copies of the Work Plan and SSHP available in site trailer?	X		
20	Are all required on site signs properly posted?	X		

WEEKLY REPORT

Prime Contract No:	W912QR-09-P-0033		**Report No.**	4
PIKA Project #:	09-08-134		**Date:**	08-03-09 to 08-07-09
Project:	TCRA at the Rocket Ridge Area of Open Demolition Area #2, Ravenna Army Ammunition Plant, Ravenna, Ohio			

Summary of Activities

- Completed initial Radiation Screening Survey across the Rocket Ridge Site.
- Radiation Screening Survey Report concludes a natural distribution of readings across the surface of the site.
- Delineated White Phosphorus contaminated area for mapping.
- Completed test pit operations and subsurface radiation screening survey.
- Although the subsurface radiation screening detections are generally higher than the surface screening results; the consensus is that the subsurface detections are not considered unusual or elevated for the type of clay soils encountered during the test pit operations. Soil samples will be processed by gamma spec for informational purposes and will be included the project report.
- A total of 8 test pits were completed across the site. One test pit at the top of the main dump area, one test pit within center of the main dump area, 3 test pits along eastern boundary and 3 test pits along western boundary (8 test pits total).
- Due to site conditions (slumping and debris encountered) encountered at the center of the main dump area (i.e., mounded portion), the UXO personnel could safely dig the test pit only up to 3-feet depth (i.e, could not reach virgin soil/bottom of pit). Based on the spatial distribution and depth information obtained from all the test pits there will be sufficient information to verify lateral extent and estimated depth of material across the site.
- Test pits along the outer boundaries Rocket Ridge Area (RRA) (i.e., sides/edge) averaged 3-feet in depth.

Others:

- Conducted daily safety briefings.

Remarks (include directions received from client's representative or regulators, visitors, compliance notices received, pertinent information) Huntsville Environmental & Munitions Center of Expertise-Military Munitions Div. conducted the Rocket Ridge Quality Assurance (QA) Assist Visit on 4 August 2009 thru 5 August 2009. The QA visit yielded positive results and constructive recommendations that were discussed with PIKA during the exit briefing. PIKA took immediate action to implement the specific recommendations to enhance site safety for workers and public.

Eileen Mohr – Ohio EPA visited the site following test pit operations on 6 August 2009. Based on actual site conditions and test pit findings, it will be necessary to re-evaluate sampling scheme identified in the Work Plan to ensure the most useful information is captured for scoping Phase II removal operations. A conference call will be scheduled to discuss path forward.

Work Completed:

	This Week	Cumulative to-date
Mobilization	100%	100%
Brush Cutting	100%	100%
Evaluation of the three 500 lb bombs	100%	100%
Removal of Immediate Explosive hazards	100%	100%
Blow-in-place one 105mm HE Projectile	100%	100%
Radiation Screening Survey	70%	85%
MEC and MD Survey Density Survey	45%	45%
Access road improvement	-	-
Demobilization	-	-

Health and Safety-

Conducted health and safety meetings and task order meetings every morning, prior to commencement of daily activities.

Were there any lost time accidents this week? No [x] Yes [ ].

If "yes", refer attached summary of incident or OSHA report.

Quality Control

Inspections Performed	Non-Conformances	Corrective Action (CA)	Follow-up on CA
Internal site inspection	None	None	Not Applicable

Major Problems and Resolution: None

Schedule for Next Week

- Complete MEC and MD Density survey.

Refer attached **Schedule** for percentage of work completed and projected completion dates.

SUXOS	Mel Lau	Site Safety Officer	Lew Kovarik
Project Manager	Brian Stockwell		

Photo Log

Conducting test pit operations in center of dump area.

Senior Health Physicist recording readings (left picture) while UXO Technician III secures radiation sensor (right picture) at test pit in center of main dump.

Digging test pit to verify lateral extent of dump area along top of slope.

Senior Health Physicist conducting screening operations at test pit along top of slope.

PIKA INTERNAL SITE QUALITY CONTROL INSPECTION

SITE LOCATION Rocket Ridge **PROJECT NUMBER** 09-08-134

DATE INSPECTED 06 Aug 09 **INSPECTOR'S NAME** Sue Bobo

PIKA ON SITE REP. Lew Kovanic

#	ITEM INSPECTED	YES	NO	N/A
1.	Is Spill Kit available and fully stocked?	X		
2.	Are all waste containers properly stored and labeled?	X		
3.	Have all assigned employees had HAZWOPER training?	X		
4.	Is at least one on site employee trained in First Aid?	X		
5.	Have all on site employees documented that they have read the RVAAP Facility Wide Safety and Health Plan?	X		
6.	Have all on site employees documented that they read the Site Specific Health and Safety Plan?	X		
7.	Have all employees documented that they have read the Site Specific Work Plan?	X		
8.	Are route maps to the local hospital posted in the office trailer?	X		
9.	Can each on site employee explain how to obtain emergency services?	X		
10.	Have all on site employees been briefed on what types of ordinance that might be found on site and what to do if found?	X		
11.	Are adequate communications available on site and are they tested daily?	X		
12.	Are daily tail gate safety meetings conducted and properly documented?	X		
13.	Have all on site employees been issued all required PPE and properly trained in its proper use, cleaning and storage?	X		
14.	Have all assigned employees documented that they have read the Facility Wide Sampling Plan?	X		
15.	Have all assigned employees documented that they have read the Site Specific Sampling Plan?	X		
16.	Are all of the required meters/instruments on site and are back ups available?	X		
17.	Are appropriate erosion control measures in place?	X		
18.	Are dust control measures being implemented			X
19.	Are copies of the Work Plan and SSHP available in site trailer?	X		
20	Are all required on site signs properly posted?	X		

WEEKLY REPORT

Prime Contract No:	W912QR-09-P-0033		**Report No.**	5
PIKA Project #:	09-08-134		**Date:**	08-10-09 to 08-14-09
Project:	TCRA at the Rocket Ridge Area of Open Demolition Area #2, Ravenna Army Ammunition Plant, Ravenna, Ohio			

Summary of Activities

- Completed delineation and marking Rocket Ridge site boundaries.
- Completed survey of the site boundaries; including test pit locations and location of the white phosphorus contaminated area for mapping and estimating debris volumes.
- Initiated evaluation of survey data for estimating debris volumes.
- Cleared construction areas for access road improvements.
- Collected subsurface soil samples from 2 test pits for processing by gamma spec for informational purposes. Data will be included in the project report.

Others:

- Conducted daily safety briefings.

Remarks (include directions received from client's representative or regulators, visitors, compliance notices received, pertinent information) The work plan calls for collecting three (3) discrete soil samples from the excavated soil/material at each of the test pit locations. Each sample is to be analyzed for RVAAP full suite analysis, perchlorates and phosphorus. Based on a site visit conducted by Ohio EPA on 6 August 2009 it has been proposed that it may be more beneficial to collect samples of the dump material for waste characterization analysis. Information obtained from this type of sampling would help identify the nature of the material (i.e, haz/nonhaz constituents) which in turn would assist in evaluating the disposal requirements and costs for the Phase II Scope of Work. Samples to be collected upon concurrence from stakeholders.

Work Completed:

	This Week	Cumulative to-date
Mobilization	-	100%
Brush Cutting	-	100%
Evaluation of the three 500 lb bombs	-	100%
Removal of Immediate Explosive hazards	-	100%
Blow-in-place one 105mm HE Projectile	-	100%
Radiation Screening Survey	15%	100%

MEC and MD Survey Density Survey	45%	90%
Access road improvement	5%	5%
Demobilization	-	-

Health and Safety-

Conducted health and safety meetings and task order meetings every morning, prior to commencement of daily activities.

Were there any lost time accidents this week? No [x] Yes [ ].

If "yes", refer attached summary of incident or OSHA report.

Quality Control

Inspections Performed	Non-Conformances	Corrective Action (CA)	Follow-up on CA
Internal site inspection	None	None	Not Applicable

Major Problems and Resolution: None.

Schedule for Next Week

- Initiate access road improvements.
- Collect test pit soil samples.
- Continue evaluation of site survey and investigation data for estimating debris volumes.

Refer attached **Schedule** for percentage of work completed and projected completion dates.

SUXOS	Mel Lau	Site Safety Officer	Lew Kovarik
Project Manager	Brian Stockwell		

Photo Log

Close-up showing concentrated area of Point Initiating Base Detonating (PIBD) fuzes near base of main dump area.

Close-up of white phosphorus rifle grenade tail assemblies present in the "white phosphorus contaminated area".

Conducting site surveying operations.

View of main dump area (outlined in red) from across Sand Creek.

Pictures showing ODA2 access road to be re-graded for installation of new gravel cover.

PIKA INTERNAL SITE QUALITY CONTROL INSPECTION

SITE LOCATION RRA **PROJECT NUMBER** 09-08-134

DATE INSPECTED 13 Aug 09 **INSPECTOR'S NAME** Sue Boren

PIKA ON SITE REP. Lew Kovarik

#	ITEM INSPECTED	YES	NO	N/A
1.	Is Spill Kit available and fully stocked?	X		
2.	Are all waste containers properly stored and labeled?	X		
3.	Have all assigned employees had HAZWOPER training?	X		
4.	Is at least one on site employee trained in First Aid?	X		
5.	Have all on site employees documented that they have read the RVAAP Facility Wide Safety and Health Plan?	X		
6.	Have all on site employees documented that they read the Site Specific Health and Safety Plan?	X		
7.	Have all employees documented that they have read the Site Specific Work Plan?	X		
8.	Are route maps to the local hospital posted in the office trailer?	X		
9.	Can each on site employee explain how to obtain emergency services?	X		
10.	Have all on site employees been briefed on what types of ordinance that might be found on site and what to do if found?	X		
11.	Are adequate communications available on site and are they tested daily?	X		
12.	Are daily tail gate safety meetings conducted and properly documented?	X		
13.	Have all on site employees been issued all required PPE and properly trained in its proper use, cleaning and storage?	X		
14.	Have all assigned employees documented that they have read the Facility Wide Sampling Plan?	X		
15.	Have all assigned employees documented that they have read the Site Specific Sampling Plan?	X		
16.	Are all of the required meters/instruments on site and are back ups available?	X		
17.	Are appropriate erosion control measures in place?			X
18.	Are dust control measures being implemented			X
19.	Are copies of the Work Plan and SSHP available in site trailer?	X		
20	Are all required on site signs properly posted?	X		

WEEKLY REPORT

Prime Contract No:	W912QR-09-P-0033		**Report No.**	6
PIKA Project #:	09-08-134		**Date:**	08-17-09 to 08-21-09
Project:	TCRA at the Rocket Ridge Area of Open Demolition Area #2, Ravenna Army Ammunition Plant, Ravenna, Ohio			

Summary of Activities

- Completed evaluation of survey data for estimating debris volumes.
- Completed access road improvements.
- Collected waste characterization samples (2 total) from main dump area. Data will be included in the project report.

Others:

- Conducted daily safety briefings.

Remarks (include directions received from client's representative or regulators, visitors, compliance notices received, pertinent information) Access road improvements inspected by Mark Patterson – RVAAP Facility Manager and Tom Chanda – USACE Louisville District. Road improvements are approved.

Work Completed:

	This Week	Cumulative to-date
Mobilization	-	100%
Brush Cutting	-	100%
Evaluation of the three 500 lb bombs	-	100%
Removal of Immediate Explosive hazards	-	100%
Blow-in-place one 105mm HE Projectile	-	100%
Radiation Screening Survey	-	100%
MEC and MD Survey Density Survey	10%	100%
Access road improvement	95%	100%
Demobilization	-	-

Health and Safety-

Conducted health and safety meetings and task order meetings every morning, prior to commencement of daily activities.

Were there any lost time accidents this week? No [x] Yes [ ].

If "yes", refer attached summary of incident or OSHA report.

Quality Control

Inspections Performed	Non-Conformances	Corrective Action (CA)	Follow-up on CA
Internal site inspection	None	None	Not Applicable

Major Problems and Resolution: None.

Schedule for Next Week

- Demobilize personnel and equipment.
- Initiate final report.

Refer attached **Schedule** for percentage of work completed and projected completion dates.

SUXOS	Mel Lau	Site Safety Officer	Lew Kovarik
Project Manager	Brian Stockwell		

Photo Log

Main access to ODA2 prior to road improvements.

Main access to ODA2 following road improvements.

Extension road to Rocket Ridge site prior to road improvements.

Extension road following road improvements.

Cul-de-sac area of extension road prior to road improvements.

Cul-de-sac area following road improvements.

PIKA INTERNAL SITE QUALITY CONTROL INSPECTION

SITE LOCATION RRA **PROJECT NUMBER** 09-08-134

DATE INSPECTED 20 Aug 09 **INSPECTOR'S NAME** Sue Baer

PIKA ON SITE REP. Lew Kovarik

#	ITEM INSPECTED	YES	NO	N/A
1.	Is Spill Kit available and fully stocked?	X		
2.	Are all waste containers properly stored and labeled?	X		
3.	Have all assigned employees had HAZWOPER training?	X		
4.	Is at least one on site employee trained in First Aid?	X		
5.	Have all on site employees documented that they have read the RVAAP Facility Wide Safety and Health Plan?	X		
6.	Have all on site employees documented that they read the Site Specific Health and Safety Plan?	X		
7.	Have all employees documented that they have read the Site Specific Work Plan?	X		
8.	Are route maps to the local hospital posted in the office trailer?	X		
9.	Can each on site employee explain how to obtain emergency services?	X		
10.	Have all on site employees been briefed on what types of ordinance that might be found on site and what to do if found?	X		
11.	Are adequate communications available on site and are they tested daily?	X		
12.	Are daily tail gate safety meetings conducted and properly documented?	X		
13.	Have all on site employees been issued all required PPE and properly trained in its proper use, cleaning and storage?	X		
14.	Have all assigned employees documented that they have read the Facility Wide Sampling Plan?	X		
15.	Have all assigned employees documented that they have read the Site Specific Sampling Plan?	X		
16.	Are all of the required meters/instruments on site and are back ups available?	X		
17.	Are appropriate erosion control measures in place?			X
18.	Are dust control measures being implemented			X
19.	Are copies of the Work Plan and SSHP available in site trailer?	X		
20	Are all required on site signs properly posted?	X		

APPENDIX D

Ohio EPA Demolition Notification and NOTAM

PIKA INTERNATIONAL, INC.

RAVENNA ARMY AMMUNITION PLANT, RAVENNA, OHIO
MUNITIONAS AND EXPLOSIVES OF CONCNCERN (MEC)
DEMOLITION/DISPOSAL NOTIFICATION

Date: July 22, 2009

Contractor: PIKA International, Inc. 12723 Capricorn Drive, Suite 500 Stafford, TX 77477
Location: Ravenna Army Ammunition Plant, Ravenna, OH
Project Name: Time Critical Removal Action (TCRA) at Rocket Ridge

POINT OF CONTACT:

Mark Patterson - RVAAP Facility Manager
Phone (330) 358- 7312
Fax (330) 358-7314

Brian Stockwell - PIKA Project Manager
Phone (330) 358-7135
Fax (330) 358-7135

Mel Lau - PIKA Senior UXO Supervisor (SUXOS)
Phone (330) 358-7135
Fax (330) 358-2924

MEC SPECIFIC INFORMATION:

Location MEC was Discovered: Rocket Ridge Area of RVAAP-004-R-1 Open Demolition Area #2 (ODA2)

Name of Person who discovered the MEC: Mel Lau – PIKA International, Inc. SUXOS

Date and Time MEC was discovered: 2004

Description of MEC to be blown: one fuzed 105-mm High Explosives (HE) Projectile

PROPOSED DESTRUCTION LOCATION:

Blow-in-Place at Rocket Area of ODA2

PROPOSED METHOD OF DESTRUCTION:

Demolition/disposal of the MEC items will be performed using 80 grain detonation cord and perforators. The demolition/disposal operations will be conducted following the requirements of the approved Work Plan for the TCRA at the Rocket Ridge Area of RVAAP-004-R-1 ODA2 (PIKA June 2009), Explosives Safety Submission TCRA at the Rocket Ridge Area of RVAAP-004-R-1 ODA2 (PIKA May 2009) the January 2009 RVAAP Installation Spill Contingency Plan and in accordance with PIKA's Standard Operating Procedure (SOP) - 13: OE Operations - Demolition and Disposal Safety.

PIKA INTERNATIONAL, INC.

RAVENNA ARMY AMMUNITION PLANT, RAVENNA, OHIO
MUNITIONAS AND EXPLOSIVES OF CONCNCERN (MEC)
DEMOLITION/DISPOSAL NOTIFICATION

PROPOSED METHODS TO MITIGATE/ABATE POTENTIAL CONTAMINATION:

In accordance with the approved Work Plans, sand bag mitigation will be used to defeat fragments from the MEC item and prevent contamination of ODA2 and Sand Creek. After the detonation, the resultant scrap metal, casings, fragments and related items will be recovered from the site and stored in Earth Covered Magazine (ECM) 1501 for subsequent handling under a separate contract. Upon completion, disturbed areas will be filled in, contoured, and seeded and mulched with an approved RVAAP seed mixture. If clean fill is needed it will be supplied from the Ohio EPA approved off site source (Patrick Excavating). During the MEC demolition operations the site will be inspected on a weekly basis in accordance with the parameters set forth in Appendix 2 (RCRA Inspection Requirements for Hazardous Waste - Open Detonation) of the January 2009 RVAAP Installation Spill Contingency Plan.

PREPAREDNESS AND PREVENTION:

- Prior to initiating any demolition work, a minimum 200 foot area around the demolition site(s) will be cleared of combustible materials such as leaves and dry grass.
- A red warning flag and/or red flashing light will be displayed at the ODA2 entrance gate during demolition operations.
- The ODA2 entrance gate will be guarded and/or locked when demolition work is in process.
- In accordance with TCRA ESS, all non-essential personnel will be evacuated outside the Minimum Separation Distance of 2501 feet during demolition operations.
- Only essential personnel (as determined by the SUXOS) will be permitted within ODA2 during demolition operations.
- No demolition activities will be performed if there is less than a 2,000 for ceiling or if wind velocity is in excess of 20 mph.
- Demolition work will only be performed during daylight hours.
- Detonations will be counted to ensure detonation of all rigged shots.

NOTIFICATIONS TO BE MADE:

At least one week prior to initiation of planned MEC Demolition/Disposal Operations, notifications will be made to the local emergency services and key project personnel listed below:

- Mark Patterson, RVAAP Facility Manager (330) 358-7311
- William O'Donell - BRAC Technical Support Office (309) 782-1395
- Glen Beckham – USACE, Louisville – (502) 315-6868
- Ohio EPA, NEDO DERR- Eileen Mohr - (330) 963-1221
- Ohio EPA, NEDO DHWM- Frank Zingales – 330-963-1108
- OHARNG - (614) 336-6790
- Air Reserve 910th Air Station (330) 609-1070

RAVENNA ARMY AMMUNITION PLANT, RAVENNA, OHIO
MUNITIONAS AND EXPLOSIVES OF CONCNCERN (MEC)
DEMOLITION/DISPOSAL NOTIFICATION

- Air Space and Procedures Office, Cleveland Air Route Traffic Control Center (Notice to Airmen) Mark Agostinelli - (440) 774-0609
- Akron Regional Air Quality management District, Lynn Malcolm (330) 375-2480
- Jim McGee, Vista Sciences Site Manager - (330) 358-3005
- RVAAP Security Dispatcher (Post 1) - (330) 358-2017
- Portage County EMA - Mark Griffiths, Director - (330) 297-3607
- Trumbull County EMA - Linda Beil, Director - (330) 675-2666
- Robinson Memorial Hospital (330) 297-0811
- Ravenna City Fire Department (330) 296-5783
- Ravenna Police Department - (330) 297-6486
- Police - Portage County Sheriff Office (330) 296-0811
- Police - Trumbull County Sheriff Office (330) 675-2508
- Ohio State Patrol (330) 297-1441
- Local News Media

If you have any questions or require any clarification on the above listed information, please call me at 330-358-7135.

Respectfully,

Brian Stockwell
Project Manager
PIKA International, Inc.

cc: Mark Patterson (RVAAP)
Glen Beckham (USACE)
Nick Stolte (USACE)
Katie Elgin (OHARNG)
Kate Anthony (PIKA)

Ravenna Arsenal NOTAM Request

Location #1 – Rocket Ridge site within Open Demolition Area 2

Reason: Evaluation of buried munitions and explosive demolition of one 105mm projectile.

Effective Date/Times: 20 July 2009 through 30 July 2009 (0700 - 1700)

Center Point: 411142N/810533W

Radius/Ceiling: 1 Nautical Mile/3000 feet AGL

PIKA International, Inc Contact info.: Lew Kovarik, 330-352-9887 or Mel Lau, 330-352-5305

Sue Boles

From: Brian Stockwell
Sent: Wednesday, September 02, 2009 9:21 AM
To: Sue Boles
Subject: FW: Ravenna Arsenal NOTAM Request
Attachments: Ravenna Arsenal - Rocket Ridge NOTAM Request 7-13-09.doc

Sue -the NOTAM for Rocket Ridge is in the e-mail below - attached is the requst form we sent to get the NOTAM Processed

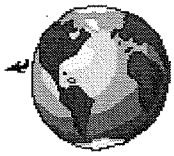
thanks

Brian,

Below is the FDC NOTAM that was published:

!FDC 9/9045 ZOB OH.. FLIGHT RESTRICTIONS RAVENNA.
EFFECTIVE 0907201100 UTC UNTIL 0907302100 UTC. PURSUANT TO 14 CFR SECTION 91.137(A)(1), TEMPORARY FLIGHT RESTRICTIONS ARE IN EFFECT FOR DEMOLITION OPERATIONS. ONLY RELIEF AIRCRAFT UNDER THE DIRECTION OF PIKA INTERNATIONAL ARE AUTHORIZED IN THE AIRSPACE AT AND BELOW 3000 FT AGL WITHIN A 1 NAUTICAL MILE RADIUS OF RAVENNA ARMY ARSENAL 411142N/0810533W AND THE AKRON (ACO) VOR/DME 048 DEGREE RADIAL AT 7.2 NAUTICAL MILES. LEW KOVARIK, PIKA INTERNATIONAL, TELEPHONE 330-352-9887, IS IN CHARGE OF THE OPERATION. CLEVELAND ARTCC /ZOB/, TELEPHONE 440-774-0426, IS THE FAA COORDINATION FACILITY

Mark Agostinelli
Cleveland ARTCC
Airspace & Procedures Office; ZOB-530.1
Phone: 440-774-0609
Fax: 440-774-0660



"Brian Stockwell" <bstockwell@pikainc.com>

07/13/2009 10:48 AM

To Mark Agostinelli/AGL/FAA@FAA

cc "Lew Kovarik" <lkovarik@pikainc.com>, "Mel Lau" <mlau@pikainc.com>

Subject Ravenna Arsenal NOTAM Request

Hi Mark - we are preparing to initiate munitions investigation operations and Blow-in-Place procedures for one munition item at a site at the Ravenna Arsenal starting next week. To that end pls see attached NOTAM request for the operations. If you have any questions or require any further information, pls let me know.

Regards,

Brian Stockwell
Project Manager
PIKA International, Inc.
330-358-7135

APPENDIX E

TCRA at Rocket Ridge Public Notification

INFORMATIONAL N0TICE

****

RAVENNA ARMY AMMUNITION PLANT (RVAAP)

July 7, 2009

Ravenna, OH – The US Army Corps of Engineers, Louisville District has contracted PIKA International, Inc. of Stafford, Texas to perform a Time Critical Removal Action (TCRA) at the Rocket Ridge Area (RRA) of Open Demolition Area #2 (ODA2) at the Ravenna Army Ammunition Plant (RVAAP). The work will include investigation and possible removal of three 500 pound bombs that were disposed of at the site in the 1950's. The TCRA at the RRA is being conducted to mitigate or abate potential explosive hazards, investigate the approximate nature, extent and volume of the Munitions and Explosives of Concern (MEC) and Munitions Debris (MD) and to prepare a Removal Action Report (RAR). The RAR will describe the action needed to be taken to remove any potential explosive hazards and detail site specific findings to aid in scoping future removal actions at Rocket Ridge. The work is expected to begin during the week of July 13, 2009 and be completed by August 28, 2009.

If you have any questions concerning the activity, please contact Mark Patterson, RVAAP Facility Manager at (330) 358-7311.

APPENDIX F

MEC Tracking Log

PIKA INTERNATIONAL, INC.

MEC TRACKING LOG

Project: Rocket Ridge TCRA at Ravenna Army Ammunition Plant, Ravenna, OH

Contract: W912QR-09-P-0033

Date	Item Description	Igloo No.	Disposition	Coresponding Designation on Survey Report #1*
7/21/2009	2 ea 500lb Bombs		Rocket Ridge Scrap	Not Applicable
7/21/2009	1 ea 105mm HE Projectile(fuzed & fired)		BIP'd	Not Applicable
7/21/2009	1 ea 75mm HE Projectile (No fuze, unfired)	7-C-4	Awaiting Demo	MEC #1
7/21/2009	1 ea 90mm Projectile (empty, poss tracer)	7-C-4	Awaiting Demo	MEC #2
7/21/2009	1 ea 75mm APHE Projectile (BD fuze, unfired)	7-C-4	Awaiting Demo	MEC #3
7/21/2009	1 ea 37mm HE Projectile (BD fuze, empty)	7-C-4	Awaiting Demo	MEC #4
7/22/2009	5 ea Bomb Fuzes, 3 ea PD fuzes (T-Bar)	7-C-4	Awaiting Demo	MEC #5
7/22/2009	76 ea PIBD fuzes	7-C-4	Awaiting Demo	MEC #6
7/23/2009	2 ea VT Fuzes	7-C-4	Awaiting Demo	MEC #7
7/23/2009	7 ea PIBD Fuzes	7-C-4	Awaiting Demo	MEC #8
7/23/2009	1 ea T-Bar Fuze	7-C-4	Awaiting Demo	MEC #9
7/23/2009	3 ea 20mm	7-C-4	Awaiting Demo	MEC #10
				* Survey Report #1 is provided in Apendix H of the Rocket Ridge Removal Action Report

APPENDIX G

Radiation Screening Survey Report

PIKA INTERNATIONAL, INC.

09 September 2009

U. S. Army Engineer District, Louisville
600 Dr. Martin Luther King, Jr. Place
Louisville KY 40202-2267

Attn: Mr. Glen Beckham, PMP, Project Manager

Sub: Summary Report – Radiological Sampling at the Rocket Ridge Area (RRA) of Open Demolition Area #2 (ODA2) at the Ravenna Army Ammunition Plant (RVAAP) in Ravenna, Ohio.

Ref: Contract Number W912QR-09-P-0033

Dear Mr. Beckham:

The purpose of this letter report is to summarize the results of samples processed by gamma spectroscopy for informational purposes. Precautionary radiological monitoring was performed at the Rocket Ridge Area (RRA) of Open Demolition Area #2 (ODA2) at the Ravenna Army Ammunition Plant (RVAAP) in Ravenna, Ohio.

Background: The radiological monitoring was requested by the RVAAP Facility Manager as a precautionary measure to ensure personnel safety due to the history of work with the Monazite sands and the radiography operations at the RVAAP installation.

Radiological Screening: The radiological screening was performed by a qualified health physics technician using a scintillation (sodium iodide) detector coupled with a ratemeter/scaler in accordance with the approved addendum. The radiological survey instruments used for this screening were calibrated and maintained in accordance with appropriate PIKA radiological procedures.

Radiological Screening of the Work Area: The radiological screening of the Rocket Ridge work area was completed on 04 August 2009. The measurement data from the gamma survey are presented in Figure 1. The results indicate a normal distribution of natural gamma levels in the work area. None of the readings exceeded the established action level of twice background. The highest reading (6725 cpm) was just outside of the work area (to the west) and was therefore not investigated further. The data are summarized in a histogram showing the distribution of the data, which appear normal.

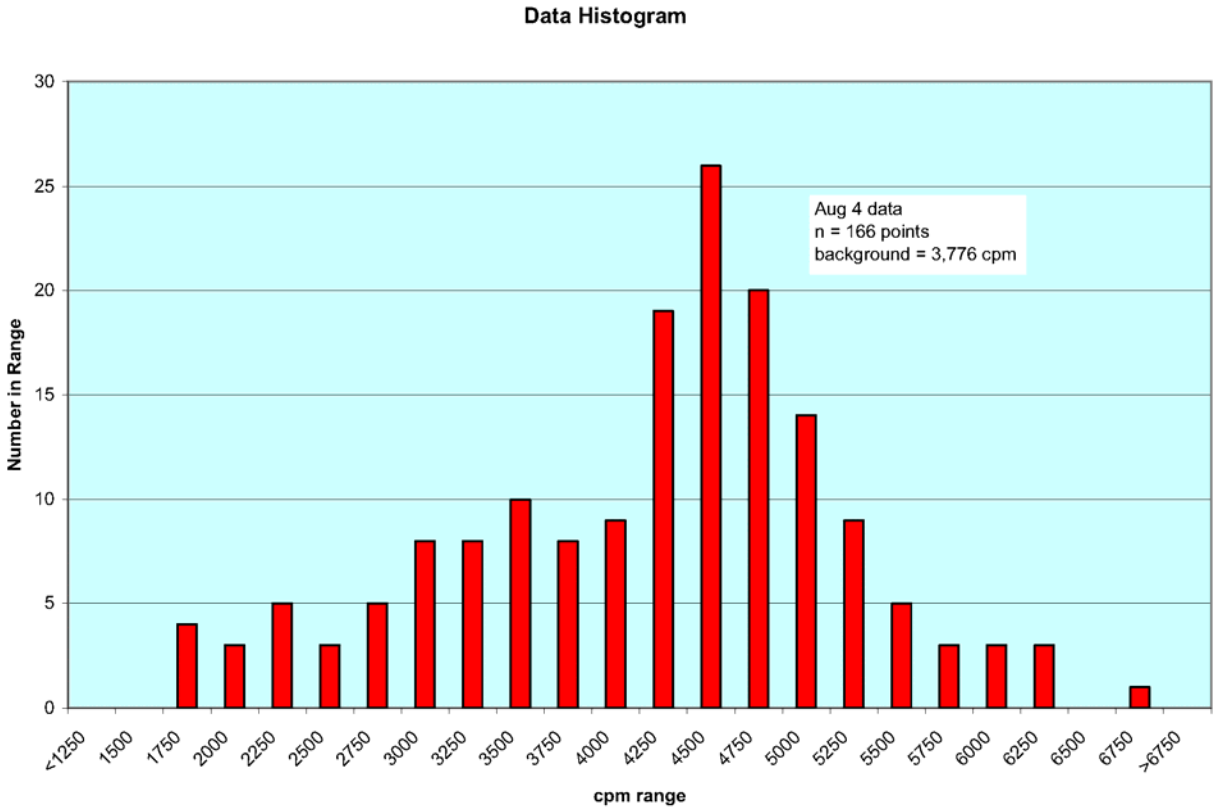


Figure 1: Gamma Survey Results of the Rocket Ridge Work Area

Radiological Screening of the Test Pits: Following the initial screening of the work area on Thursday (06 Aug), eight (8) test pits were dug at the site as part of the Time Critical Removal Action investigation of the RRA with radiological support provided by a qualified health physics technician. Figure 2 summarizes the results from the radiological survey of the test pits. A field radiological survey report documenting the results is provided separately as Attachment 1 to this letter report. Results of the radiological surveys indicated that the Pit #s 1 and 6 had elevated gamma. Pit #1 had approximately 3 times the ambient background and Pit #6 had greater than 2 times the background. It was found that the mid to bottom regions of the pits (which is where elevated readings were found) were virgin clayey soils.

The observed elevated gamma readings appear to be due to potassium (K) in the soil. Potassium contains naturally radioactive K-40, which is 0.01% of all potassium. This is further discussed in the section on Soil Sample Analysis.

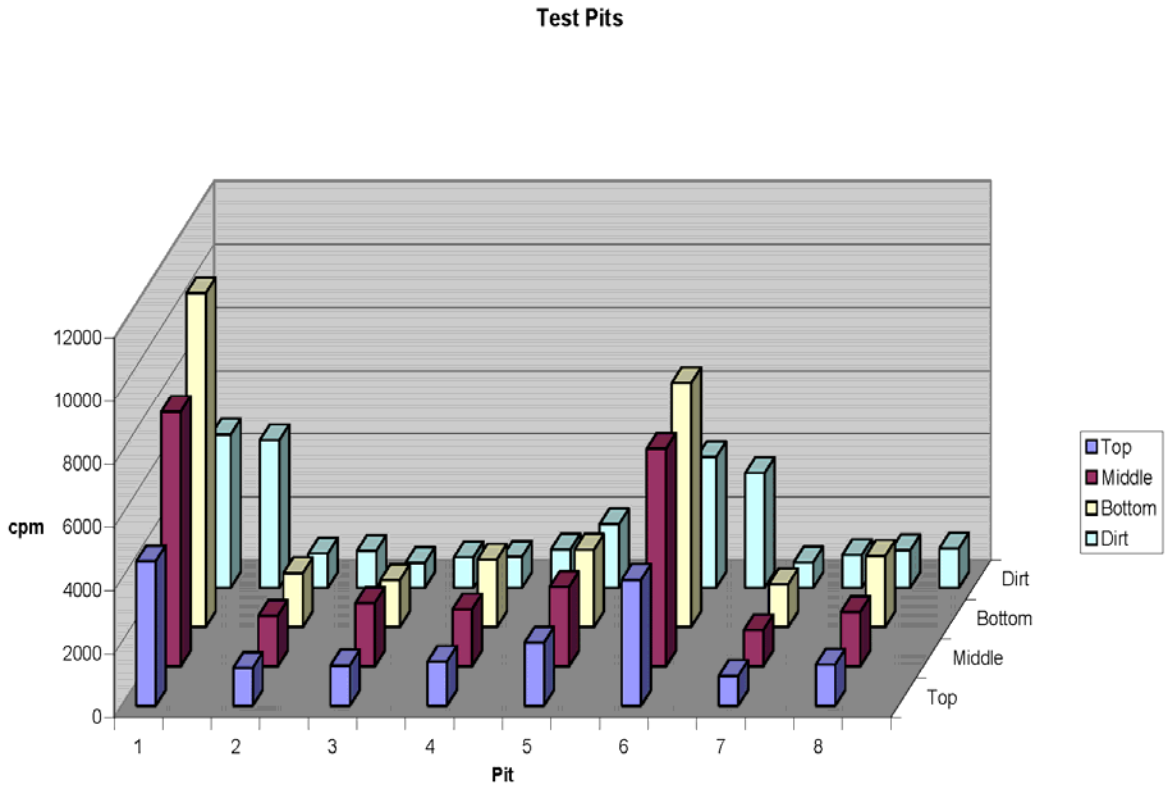


Figure 2: Gamma Survey Results of the Rocket Ridge Test Pits

Additionally, elevated readings in the pits should be expected based on the nature of the sodium iodide (NaI) detectors used for the screening; the detectors are omni-directional unless collimated. When scanning in a pit, the detector "sees" radioactivity from all directions contributing to the signal. As it gets closer to the bottom of the hole, the readings tend to increase.

Though the soils in the pits clearly appeared to be natural/virgin and clayey and did not have an appearance of Monazite sands, soil samples were collected from the two pits that showed the highest gamma readings to determine if the source of the elevated radiation was natural background. The soil samples were processed using gamma spectroscopy. These analyses were for informational purposes only.

Soil Sample Analysis: Soil samples were collected from the two test pits (#1 and #6) that showed the highest gamma radiation levels. Two samples each were collected from pits #1 and #6. A background soil sample was collected from an area about 100m from the test pits for comparison. The samples were analyzed at PIKA's gamma

spectroscopy laboratory in Sacramento, California to determine what nuclides were responsible for the gamma radiation.

Results are summarized in Figure 3. Uranium, thorium and radium were present in these samples at background levels. In addition, Cesium-137 was found in one pit sample and the background soil sample. Elevated levels of potassium-40 were also observed in the samples. This is a naturally radioactive component of potassium, comprising less than 0.01% of natural potassium.

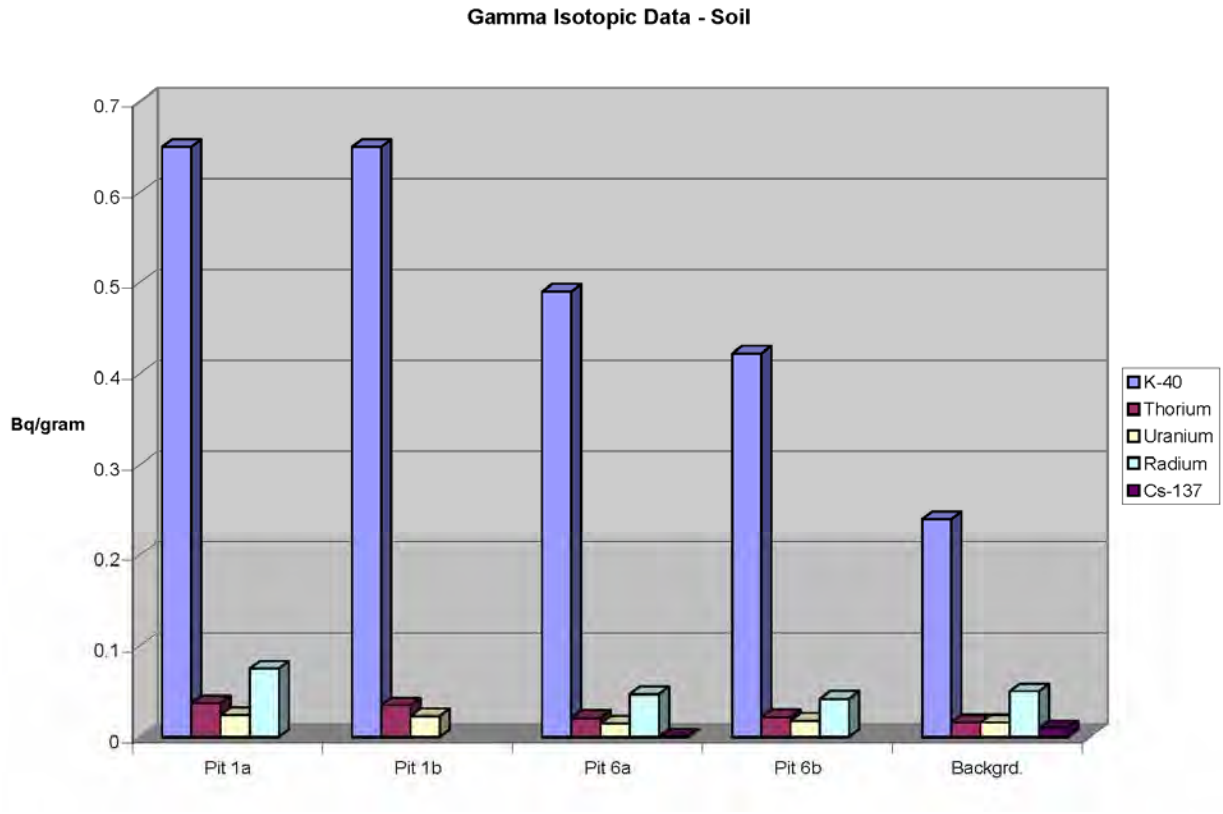


Figure 3: Gamma Spectroscopy Results Rocket Ridge Test Pit Samples (Pit #1 and Pit #6 and Background Area

The cesium-137 found in one pit sample and the background soil sample is believed to be residual fall-out from historical nuclear weapons' testing in the U.S. and elsewhere and is common. Pit #1, with the highest gamma screening levels, also has the highest K-40 content. Pit #6, with the next highest gamma screening level, has the second highest K-40 content. It is not known whether these distributions are due to natural variability of potassium in the soil, or if munitions residue has increased the potassium levels in these pits to above background levels.

PIKA INTERNATIONAL, INC.

In conclusion, only naturally occurring radioactive nuclides were found, except for a trace amount of cesium-137, which is attributed to the residual fall-out. Results of the gamma screening survey are explained by the levels of potassium found in these soil analyses. No further radiological investigations are planned or deemed necessary.

Please contact me at 510-914-6262 or Dr. Srini Neralla at 281-703-1582 should you need any further information.

Yours truly,

Joel I. Cehn, CHP
Radiation Safety Officer

CC: Mr. Clint J. Henker
Mr. Travis McCoun
Dr. Srini Neralla
Mr. Brian Stockwell

12723 Capricorn Drive #500, Stafford, Texas 77477; 281-340-5525 tel 281-340-5533 fax

PIKA INTERNATIONAL, INC.

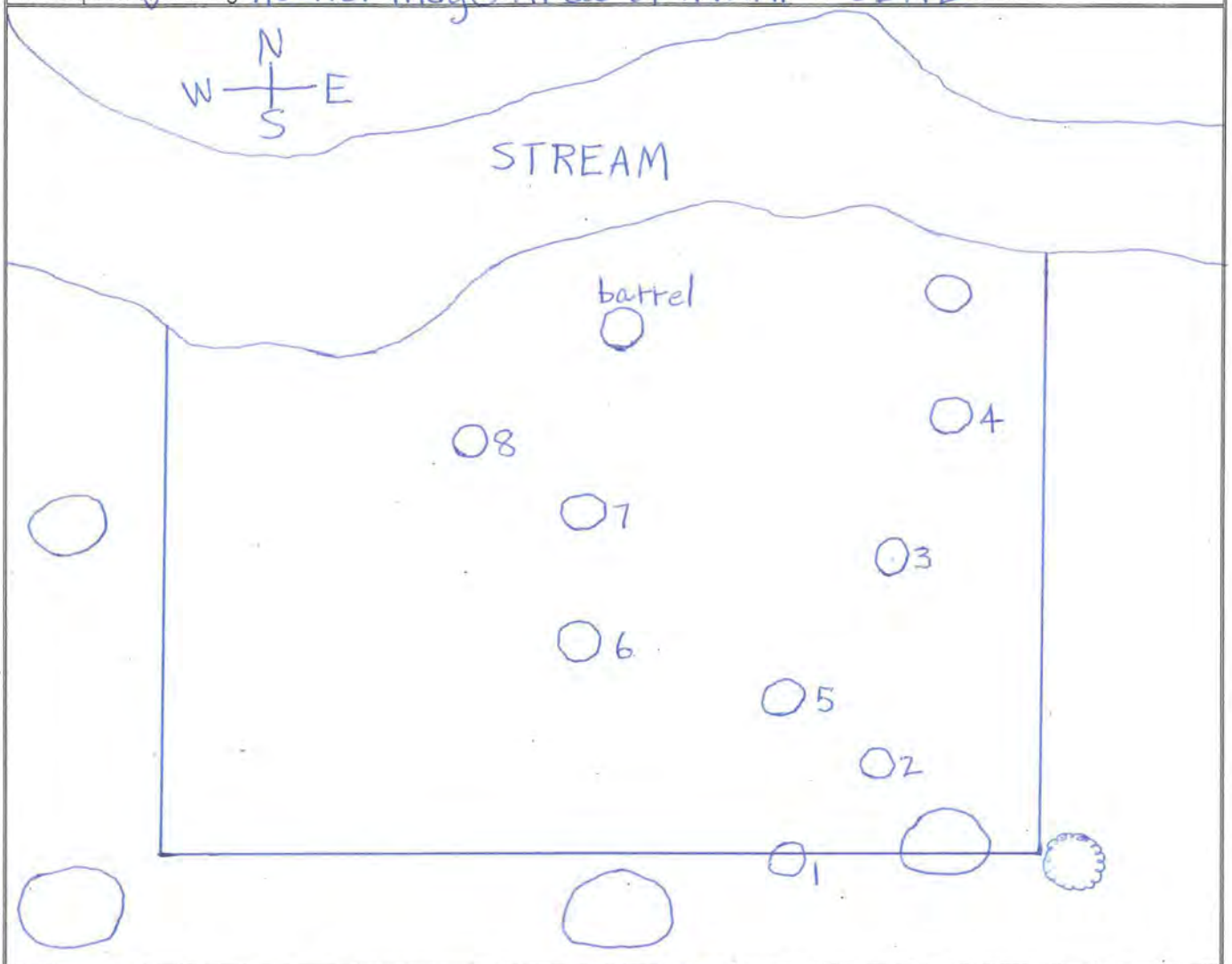
ATTACHMENT 1

SURVEY REPORT AND DATA

12723 Capricorn Drive #500, Stafford, Texas 77477; 281-340-5525 tel 281-340-5533 fax

DATE: 8/6/09 TIME: 1115 1500	INSTRUMENTATION USED				
SURVEY NUMBER:	MODEL	S/N	% EFF.	CAL DUE	BKGD
LOCATION: ODAZ	2221	172025	N/A	29MAY10	3725CPM
SURVEYOR: D. Lohafer	44-10	PR230155	7.1%	29MAY10	
REVIEWED BY: ~~Joanne Haslett~~	2360	225173	N/A	29MAY10	6.2 CPM α 325 CPM β
RSO/HP: Joel I Cole	43-93	PR237000	18% α 19.3% β	29MAY10	

Description of drawing: Rocket Ridge Area of RVAAP - ODAZ



Routine ☐ (Daily / Weekly / Monthly) Non-routine ☒

Comments: See attached data.
BKg at perimeter delineation line post ca. 100 yards south
18623 cnts / 5 min = 3725 CPM β
31 cnts / 5 min = 6.2 CPM α
1623 cnts / 5 min = 325 CPM β

All radiation readings in μr/hr unless otherwise noted.
(#)....denotes smear location or fixed α/β readings.
#.....denotes G/A radiation readings.
#/#...denotes contact / 1 meter radiation readings.
*.....denotes highest radiation reading on contact.
Δ.....denotes A/S location.

8/6/09 1115 and 1500
ODAZ

Pit # 1 ca. 2 ft wide by 2 ft deep
topsoil and clay

top	4560 CPM γ
middle	8048 CPM γ
bottom	10567 CPM γ
dirt from pit	4840 CPM γ
dirt from pit	4658 CPM γ
dirt from pit	3 CPM α
dirt from pit	431 CPM β

Pit # 2 ca. 1.5 ft wide by 1.5 ft deep
edge of debris field - clay

top	1193 CPM γ
middle	1597 CPM γ
bottom	1705 CPM γ
dirt from pit	1080 CPM γ
dirt from pit	1166 CPM γ
dirt from pit	6 CPM α
dirt from pit	371 CPM β

Pit # 3 ca. 2 ft wide by 2 ft deep
edge of debris field - clay

top	1271 CPM γ
middle	2001 CPM γ
bottom	1490 CPM γ
dirt from pit	788 CPM γ
dirt from pit	965 CPM γ
dirt from pit	3 CPM α
dirt from pit	239 CPM β

Pit # 4 ca. 1 ft wide by 1 ft deep
topsoil

top	1391 CPM γ
middle	1800 CPM γ
bottom	2135 CPM γ
dirt from pit	978 CPM γ
dirt from pit	1213 CPM γ
dirt from pit	1 CPM α
dirt from pit	359 CPM β

Pit # 5 ca. 2 ft wide by 3 ft deep
in debris field

top	1989 CPM γ
middle	2508 CPM γ
bottom	2443 CPM γ
dirt from pit	2008 CPM γ
dirt from pit	1945 CPM γ
dirt from pit	1 CPM α
dirt from pit	252 CPM β

Pit # 6 ca. 2 ft wide by 2.5 ft deep
edge of debris field

top	3975 CPM γ
middle	6869 CPM γ
bottom	7730 CPM γ
dirt from pit	4120 CPM γ
dirt from pit	3621 CPM γ
dirt from pit	2 CPM α
dirt from pit	372 CPM β

Pit # 7 ca. 1.5 ft wide by 1.5 ft deep
edge of debris field - topsoil and clay

top	940 CPM γ
middle	1138 CPM γ
bottom	1354 CPM γ
dirt from pit	804 CPM γ
dirt from pit	1035 CPM γ
dirt from pit	2 CPM α
dirt from pit	291 CPM β

Pit # 8 ca. 1 ft wide by 1 ft deep
edge of debris field - topsoil

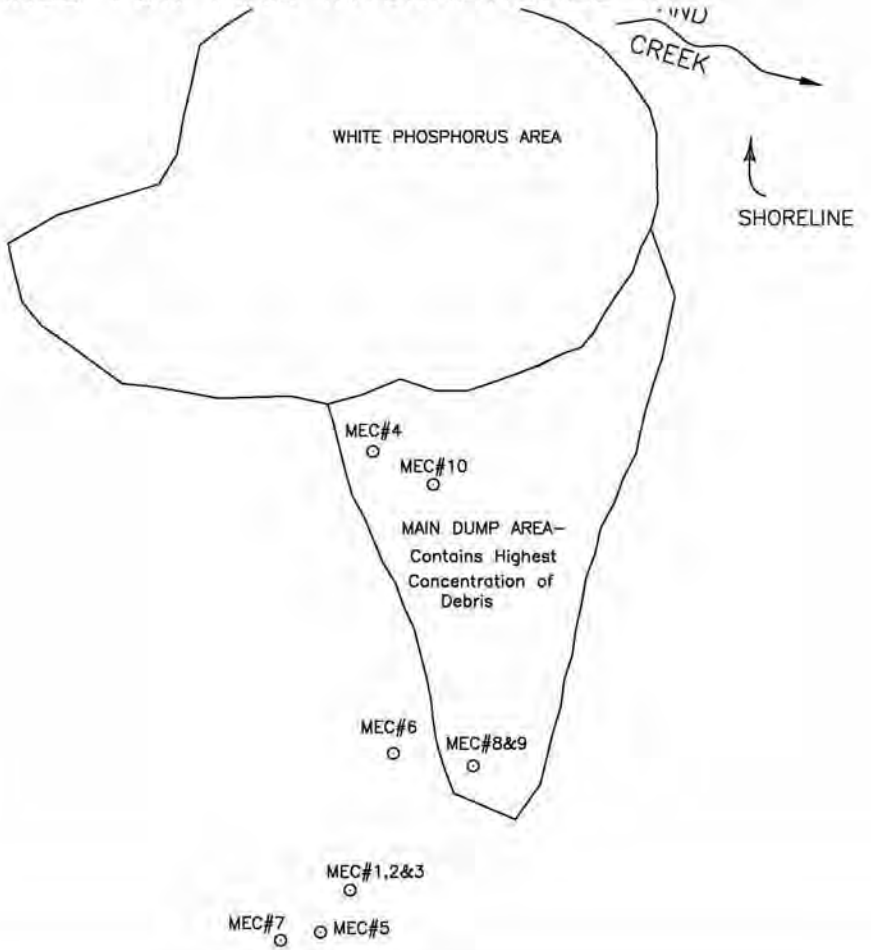
top	1297 CPM γ
middle	1719 CPM γ
bottom	2247 CPM γ
dirt from pit	1182 CPM γ
dirt from pit	1242 CPM γ
dirt from pit	4 CPM α
dirt from pit	355 CPM β

APPENDIX H

Survey Reports

Survey Report #1 - Locations of Acceptable to Move MEC Items
Survey Report #2 - White Phosphorus Area and Main Dump Area
Survey Report #3 - Extent of White Phosphorus and Main Dump Area
Survey Report #4 - Site Contours
Survey Report #5 - RRA Excavation Quantities
Survey Report #6 - Test Pit Locations

ROCKET RIDGE SURVEY REPORT # 1 (LOCATIONS OF ACCEPTABLE TO MOVE MEC ITEMS)
RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO PORTAGE COUNTY
PREPARED FOR PIKA INTERNATIONAL INC.



0 10 20

BAR SCALE IN FEET

CAUTION: IF THIS BAR DOES NOT MEASURE 2" LONG, THEN THIS DRAWING IS NOT AT THE STATED SCALE.

STATE OF OHIO
DONALD TROCCHIO
6445
REGISTERED SURVEYOR

AUGUST 11–18, 2009

PH 330-296-2875

DON TROCCHIO

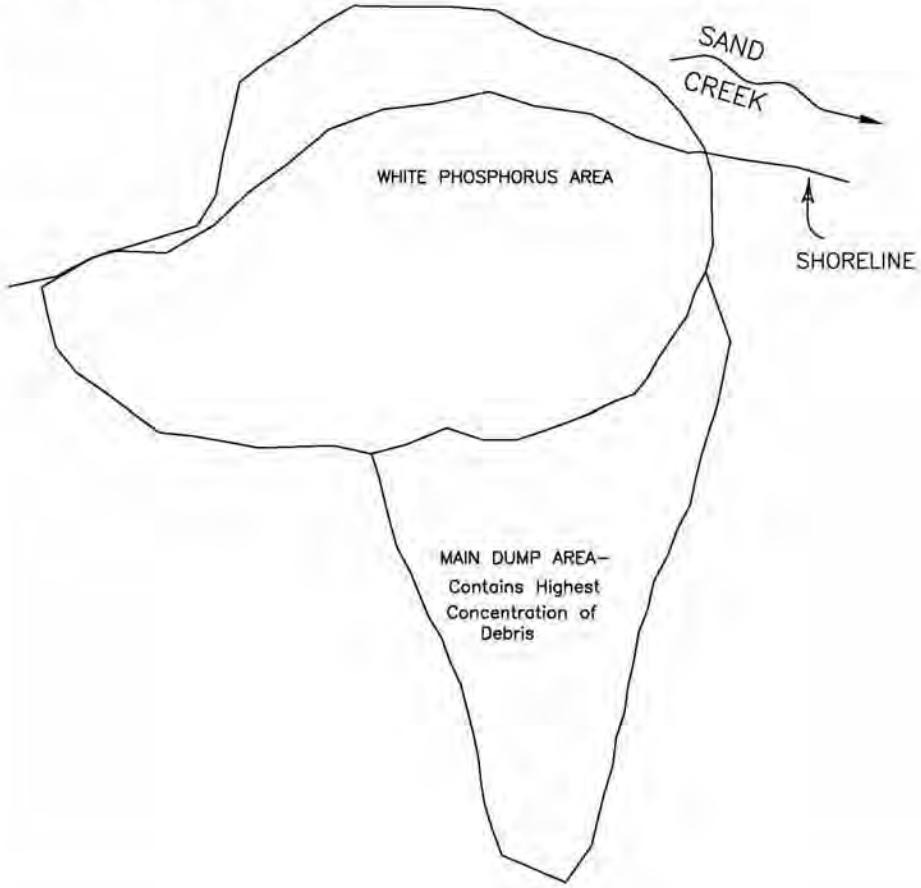
5485 McCORMICK ROAD
P.O. BOX 526
RAVENNA, OH 44266

REGISTERED SURVEYOR NO.6445

DRAWING NOTES

1. BEARINGS ARE GRID NORTH, NAD83 OHIO STATE PLANE RECTANGULAR COORDINATES, NORTH ZONE ORIGINATING FROM RAV 3 DISC IN CONC.
   N561955.072 E2357760.413 ELV 1034.46
2. COORDINATES SHOWN ARE GRID
3. COMBINED SCALE FACTOR USED 0.999895
4. YOU MAY DOWNLOAD THE FREE UTILITY CORPSCON AT http://crunch.tec.army.mil/software/corpscon/corpscon.html TO CONVERT COORDINATES TO ANOTHER MAP PROJECTION

ROCKET RIDGE SURVEY REPORT # 2 (White Phosphorus Area and Main Dump Area)
RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO PORTAGE COUNTY
PREPARED FOR PIKA INTERNATIONAL INC.



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STATE OF OHIO
DONALD TROCCHIO
6445
REGISTERED SURVEYOR

AUGUST 11–18, 2009

PH 330-296-2375

DON TROCCHIO

5485 McCORMICK ROAD
P.O. BOX 528
RAVENNA, OH 44266

REGISTERED SURVEYOR NO.6445

DRAWING NOTES

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2. COORDINATES SHOWN ARE GRID
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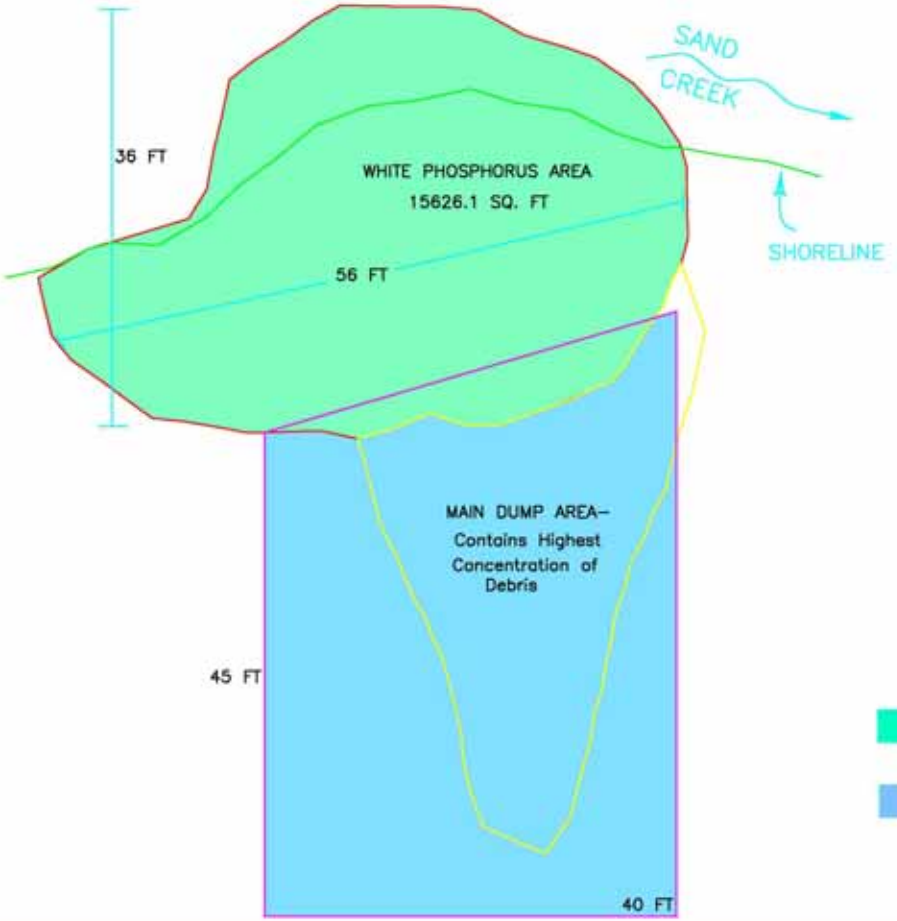
ROCKET RIDGE SURVEY REPORT #3 (EXTENT OF White Phosphorus and Main Dump Area)
RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO PORTAGE COUNTY
PREPARED FOR PIKA INTERNATIONAL INC.



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STATE OF OHIO
DONALD TROCCHIO
6445
REGISTERED SURVEYOR

AUGUST 11–18, 2009

PH 330-296-2375

DON TROCCHIO

5485 McCORMICK ROAD
P.O. BOX 528
RAVENNA, OH 44266

REGISTERED SURVEYOR NO.6445

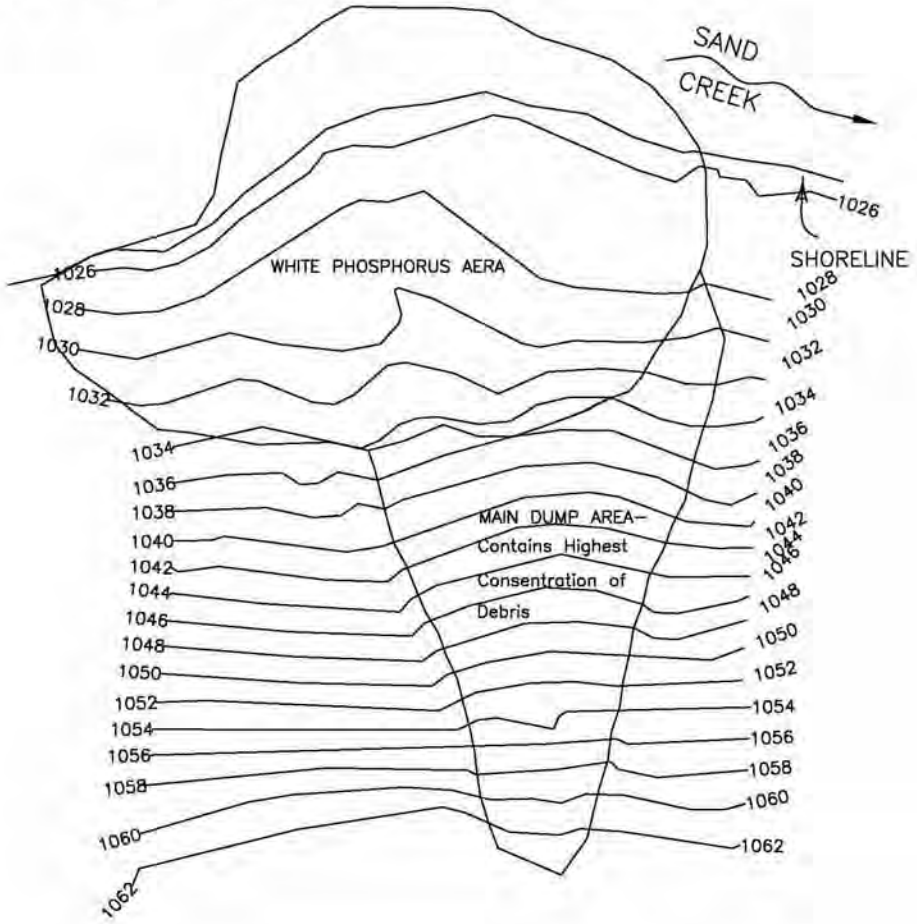
Maximum Extent of White Phosphorus Area

Maximum Extent of Dump Area

DRAWING NOTES

1. BEARINGS ARE GRID NORTH, NAD83 OHIO STATE PLANE RECTANGULAR COORDINATES, NORTH ZONE ORIGINATING FROM RAV 3 DISC IN CONC. N561955.072 E2357780.413 ELV 1034.46
2. COORDINATES SHOWN ARE GRID
3. COMBINED SCALE FACTOR USED 0.999895
4. YOU MAY DOWNLOAD THE FREE UTILITY CORPSCON AT http://crunch.tec.army.mil/software/corpscon/corpscon.html TO CONVERT COORDINATES TO ANOTHER MAP PROJECTION

ROCKET RIDGE SURVEY REPORT # 4 (SITE CONTOURS)
RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO PORTAGE COUNTY
PREPARED FOR PIKA INTERNATIONAL INC.



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BAR SCALE IN FEET

CAUTION: IF THIS BAR DOES NOT MEASURE 2" LONG, THEN THIS DRAWING IS NOT AT THE STATED SCALE.

STATE OF OHIO
DONALD TROCCHIO
6445
REGISTERED SURVEYOR

AUGUST 11–18, 2009

PH 330-296-2375

DON TROCCHIO

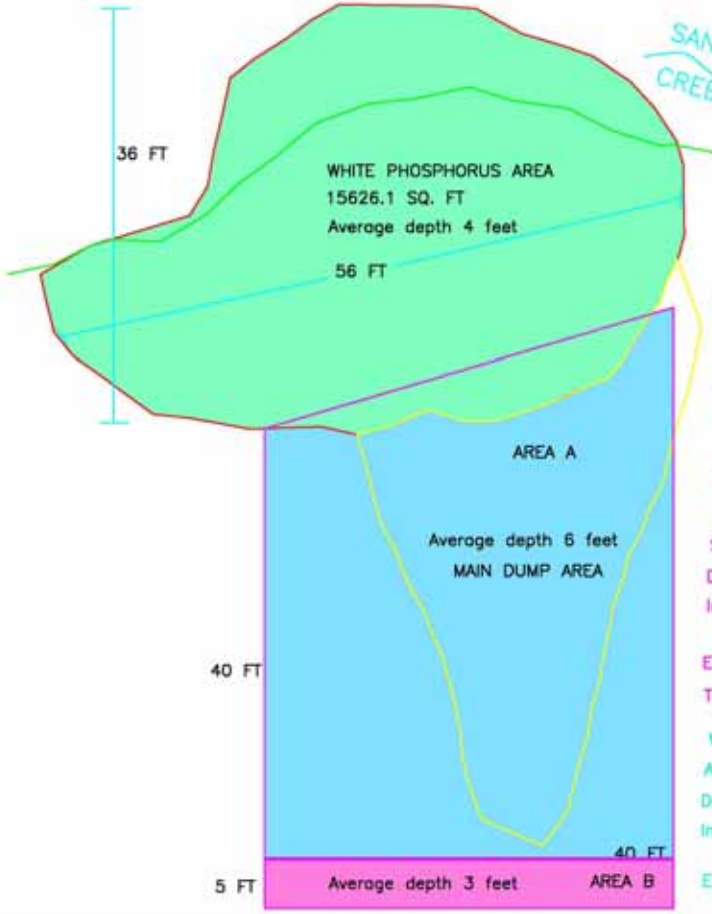
5485 McCORMICK ROAD
P.O. BOX 528
RAVENNA, OH 44266

REGISTERED SURVEYOR NO.6445

DRAWING NOTES

1. BEARINGS ARE GRID NORTH, NAD83 OHIO STATE PLANE RECTANGULAR COORDINATES, NORTH ZONE ORIGINATING FROM RAV 3 DISC IN CONC.
   N561955.072 E2357760.413 ELV 1034.46
2. COORDINATES SHOWN ARE GRID
3. COMBINED SCALE FACTOR USED 0.999895
4. YOU MAY DOWNLOAD THE FREE UTILITY CORPSCON AT http://crunch.tec.army.mil/software/corpscon/corpscon.html TO CONVERT COORDINATES TO ANOTHER MAP PROJECTION

ROCKET RIDGE SURVEY REPORT # 5 (RRA EXCAVATION QUANTITIES)
RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO PORTAGE COUNTY
PREPARED FOR PIKA INTERNATIONAL INC.



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BAR SCALE IN FEET

CAUTION: IF THIS BAR DOES NOT MEASURE 2" LONG, THEN THIS DRAWING IS NOT AT THE STATED SCALE.

Main Dump Qnty

Area A

Surface Area = 1/2 x(40+50)x40 = 1,800sq.ft.

Depth = 6 ft

In-place Volume = 1,800 x 6 = 10,800 cu. ft.
= 400 cyd

Excavated/Processed Volume = 400 x 1.2 = 480 cyd.

Area B

Surface Area = 5 x 40 = 200 sq.ft.

Depth = 3 ft

In-place Volume = 200 x 3 = 600cu. ft.
= 22 cyd

Excavated/Processed Volume = 22 x 1.2 = 26 cyd

Total Qnty for main Dump Area = 480 + 26 = 506 cyd.

WP Qnty

Area = 1,526 sq.ft.

Depth = 4 ft

In-place Volume = 1,526 x 4 = 6,104 cu. ft.
= 226 cyd

Excavated Volume = 226 x 1.2 = 271.2 cyd.

STATE OF OHIO
DONALD TROCCHIO
6445
REGISTERED
SURVEYOR

AUGUST 11–18, 2009

PH 330-296-2375

DON TROCCHIO

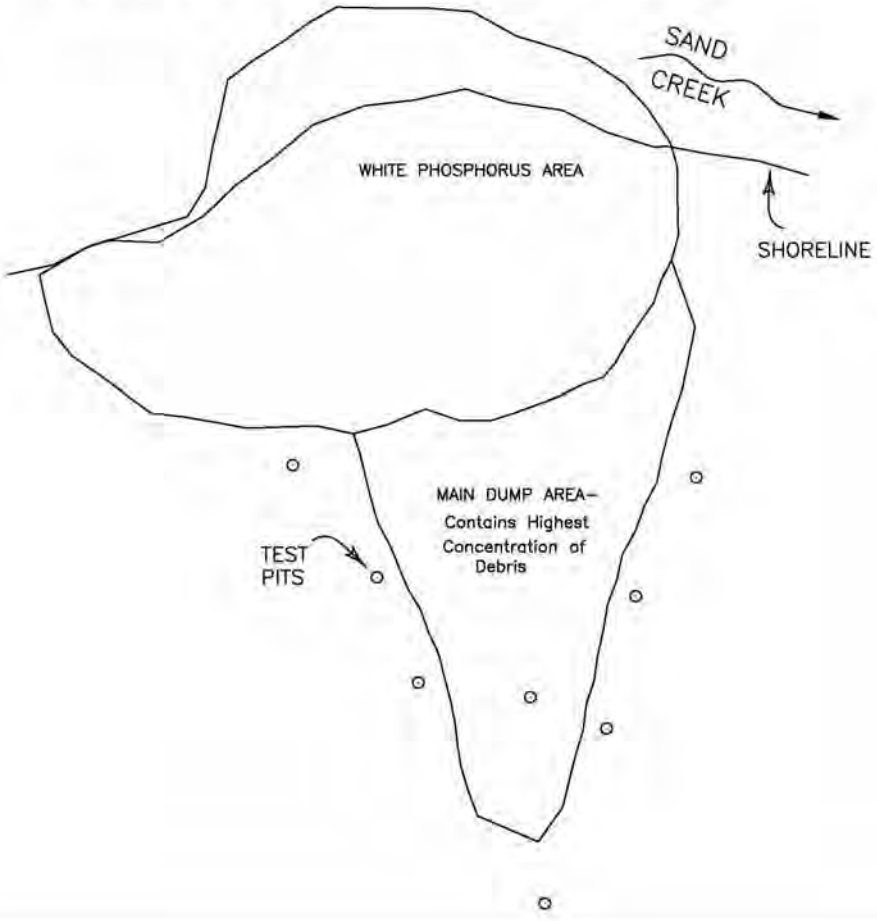
5485 McCORMICK ROAD
P.O. BOX 526
RAVENNA, OH 44266

REGISTERED SURVEYOR NO.6445

DRAWING NOTES

1. BEARINGS ARE GRID NORTH, NAD83 OHIO STATE PLANE RECTANGULAR COORDINATES, NORTH ZONE ORIGINATING FROM RAV 3 DISC IN CONC.
   N561955.072 E2357760.413 ELV 1034.46
2. COORDINATES SHOWN ARE GRID
3. COMBINED SCALE FACTOR USED 0.999995
4. YOU MAY DOWNLOAD THE FREE UTILITY CORPSCON AT http://crunch.tec.army.mil/software/corpscon/corpscon.html TO CONVERT COORDINATES TO ANOTHER MAP PROJECTION

ROCKET RIDGE SURVEY REPORT # 6 (TEST PIT LOCATIONS)
RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO PORTAGE COUNTY
PREPARED FOR PIKA INTERNATIONAL INC.



GRID NORTH

0 10 20

BAR SCALE IN FEET

CAUTION: IF THIS BAR DOES NOT MEASURE 2" LONG, THEN THIS DRAWING IS NOT AT THE STATED SCALE.

STATE OF OHIO
DONALD
TROCCHIO
6445
REGISTERED
SURVEYOR

AUGUST 11–18, 2009

PH 330-296-2375

DON TROCCHIO

5485 McCORMICK ROAD
P.O. BOX 528
RAVENNA, OH 44266

REGISTERED SURVEYOR NO.8445

DRAWING NOTES

1. BEARINGS ARE GRID NORTH, NAD83 OHIO STATE PLANE RECTANGULAR COORDINATES, NORTH ZONE ORIGINATING FROM RAV 3 DISC IN CONC.
   N561955.072 E2357760.413 ELV 1034.46
2. COORDINATES SHOWN ARE GRID
3. COMBINED SCALE FACTOR USED 0.999895
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APPENDIX I

E-mail Correspondence

Sue Boles

From: Brian Stockwell
Sent: Wednesday, September 02, 2009 9:19 AM
To: Sue Boles
Subject: FW: Rocket Ridge sampling

Sue - below is the Ohio EPA e-mail correspndence for the sampling modifications at Rocket Ridege - including the change for backfilling of the test pits

Hi Brian

Your email is accurate. Also... I okayed the filling in of the test pits with the material dug out of the pits, as all this material will be ultimately removed in phase 2.

Eileen

Eileen T. Mohr
Project Manager
Division of Emergency and Remedial Response
2110 East Aurora Road
Twinsburg, OH 44087
330-963-1221
330-487-0769 (FAX)
email: Eileen.Mohr@epa.state.oh.us
>>> "Brian Stockwell" <bstockwell@pikainc.com> 08/14/09 2:38 PM >>>
Hi Eileen - per our conversation yesterday regarding the proposed changes to the Rocket sampling operation, pls advise if the following description accurately describes the details and rationale for the change. If so, this e-mail will serve to record the agreed upon change and will be included in the project report.

During your visit to the Rocket Ridge site on 6 Aug 2009 we discussed the follow-on sampling requirements for the excavated soils at the completed test pits as described in the Work Plan. The plan calls for collecting three (3) discrete soil samples from the excavated soil/material at each of the test pit locations. Each sample is to be analyzed for RVAAP full suite analysis, perchlorates and phosphorus. We discussed that instead of the sampling for the analytes and frequencey outlined in the Work Plan, it would actually be more beneficial to collect samples of the dump material for waste characterization analysis. Information obtained from this type of sampling would help identify the nature of the material (i.e, haz/nonhaz constituents) which in turn would assist in evaluating the disposal requirements and costs for the Phase II Scope of Work. To that end, we discussed collecting one discrete sample from the test pit in upper portion of the slope and another near the bottom from the resultant cavity of where one of the 500 lb bambs was removed to ensure that a representative cross section of the material was captured for analysis. Each sample would be analyzed for full TCLP, explosives, propellants, pH, ignitability, and reactivity (cyanide and sulfide).

Pls advise if the above accurately summarizes the Rocket Ridge sampling modification we discussed; or if any further information is required. Upon final approval from Ohio EPA and notice to proceed from the USACE- Louisville District PIKA will initiate the Rocket Ridge Sampling activity.

Regards,

Brian Stockwell
Project Manager
PIKA Internatioanl, Inc.
330-358-7135

APPENDIX J

Summary Table, Field Sample Reports and Lab Results

SUMMARY TABLE
ROCKET RIDGE PIT SAMPLES

ANALYTE**, UNITS, METHOD NO.	TCLP HAZARDOUS WASTE LIMITS mg/kg	RRP1-AA-PIT05-001		RRP1-AA-PIT09-001	
Sample Date		8/17/2009		8/17/2009	
EXPLOSIVES 8330 mg/kg					
1,3,5-Trinitrobenzene	NA	10		1.3	PG
1,3-Dinitrobenzene	NA	0.50	J	ND	
2,4,6-Trinitrotoluene	NA	71		2.6	
2,4-Dinitrotoluene	NA	0.55	J	0.078	J
2,6-Dinitrotoluene	NA	0.35	J	0.031	J
2-Amino-4,6-Dinitrotoluene	NA	2.5		1.2	
2-Nitrotoluene	NA	ND		ND	
3-Nitrotoluene	NA	ND		ND	
4-Amino-2,6-Dinitrotoluene	NA	3.1		1.8	
4-Nitrotoluene	NA	ND		ND	
HMX	NA	0.62	J	0.072	J
Nitrobenzene	NA	ND		ND	
Nitroglycerine	NA	ND		ND	
PETN	NA	ND		ND	
RDX	NA	2.2		0.46	
Tetryl	NA	ND		ND	
Propellants mg/kg 8330 Mod					
Nitroguanidine	NA	ND		ND	
ICP METALS TCLP 6010B mg/L					
Arsenic	5.0	ND		0.0085	B
Lead	5.0	22.2		0.034	B
Selenium	1.0	0.0056	B	ND	
Silver	5.0	ND		ND	
Barium	100.0	11.1		0.78	B
Cadmium	1.0	1.3		0.70	
Chromium	5.0	ND		0.0027	B
Mercury 7470A TCLP mg/L					
Mercury	0.2	ND		ND	
VOCS 8260B ug/kg					
Chloromethane	NA	ND		ND	
Bromomethane	NA	ND		ND	
Vinyl chloride	0.2	ND		ND	
Chloroethane	NA	ND		ND	
Methylene Chloride	NA	ND		ND	
Acetone	NA	ND		ND	
Carbon disulfide	NA	ND		ND	
1,1-Dichloroethene	NA	ND		ND	
1,1-Dichloroethane	NA	ND		ND	
1,2-Dichloroethene (total)	NA	ND		ND	
Chloroform	6.0	ND		ND	
1,2-Dichloroethane	0.5	ND		ND	

SUMMARY TABLE
ROCKET RIDGE PIT SAMPLES

ANALYTE**, UNITS, METHOD NO.	TCLP HAZARDOUS WASTE LIMITS mg/kg	RRP1-AA-PIT05-001	RRP1-AA-PIT09-001
2-Butanone	NA	ND	ND
1,1,1-Trichloroethane	NA	ND	ND
Carbon tetrachloride	0.5	ND	ND
Bromodichloromethane	NA	ND	ND
1,2-Dichloropropane	NA	ND	ND
cis-1,3-Dichloropropene	NA	ND	ND
Trichloroethene	NA	ND	ND
Dibromochloromethane	NA	ND	ND
1,1,2-Trichloroethane	NA	ND	ND
Benzene	0.5	ND	ND
trans-1,3-Dichloropropene	NA	ND	ND
Bromoform	NA	ND	ND
4-Methyl-2-pentanone	NA	ND	ND
2-Hexanone	NA	ND	ND
Tetrachloroethene	NA	ND	ND
1,1,2,2-Tetrachloroethane	NA	ND	ND
Toluene	NA	ND	ND
Chlorobenzene	100.0	ND	ND
Ethylbenzene	NA	ND	ND
Styrene	NA	ND	ND
Xylenes (Total)	NA	ND	ND
VOCS 8260B TCLP mg/L			
Benzene	0.5	ND	ND
2-Butanone (MEK)	NA	ND	ND
Carbon tetrachloride	0.5	ND	ND
Chlorobenzene	100.0	ND	ND
Chloroform	6.0	ND	ND
1,2-Dichloroethane	0.5	ND	ND
1,1-Dichloroethylene	0.7	ND	ND
Tetrachloroethylene	0.7	ND	ND
Trichloroethylene	0.5	ND	ND
Vinyl chloride	0.2	ND	ND
SVOC 8270C TCLP mg/L			
o-Cresol	200.0	ND	ND
m-Cresol & p-Cresol	200.0	ND	ND
1,4-Dichlorobenzene	7.5	ND	ND
2,4-Dinitrotoluene	0.13	ND	ND
Hexachlorobenzene	0.13	ND	ND
Hexachlorobutadiene	0.5	ND	ND
Hexachloroethane	3.0	ND	ND
Nitrobenzene	2.0	ND	ND
Pentachlorophenol	100.0	ND	ND
Pyridine	5.0	ND	ND
2,4,5-Trichlorophenol	400.0	ND	ND
2,4,6-Trichlorophenol	2.0	ND	ND

SUMMARY TABLE
ROCKET RIDGE PIT SAMPLES

ANALYTE**, UNITS, METHOD NO.	TCLP HAZARDOUS WASTE LIMITS mg/kg	RRP1-AA-PIT05-001	RRP1-AA-PIT09-001
PESTICIDES 8081A TCLP ug/kg			
Chlordane (technical)	0.03	ND	ND
Endrin	0.02	ND	ND
Heptachlor	0.008	ND	ND
Heptachlor epoxide	0.008	ND	ND
Lindane	0.4	ND	ND
Methoxychlor	10.0	ND	ND
Toxaphene	0.5	ND	ND
HERBICIDES 8151A TCLP ug/kg			
2,4-D	10.0	ND	ND
2,4,5-TP (Silvex)	1.0	ND	ND
Inorganic Analysis			
Cyanide, Total (mg/kg)	250	2	5.5
Flashpoint at 140 (deg F)	<140	>140	>140
Nitrocellulose as N, 353.2 (mg/kg)	NA	35.5	13.7
Soil and Waste pH	$\leq$ 2 or $\geq$ 12.5	7.6	8.6
Total Residue as Percent Solids (%)	NA	70.2	51.1
Sulfides, Total mg/kg	500	ND	ND

Notes:
ug/L = micrograms per liter (parts per billion)
ug/kg = micrograms per kilogram (parts per billion)
mg/kg = milligrams per kilogram (parts per million)
mg/L = milligrams per liter (parts per million)
NA = not applicable
Organics:
ND = Indicates that the compound was analyzed for but not detected
J = Estimated result. Result is less than Reporting Limit
PG = The percent difference between the original and confirmation analysis is greater than 40%
Inorganics:
ND = Indicates that the compound was analyzed for but not detected
B = Estimated result. Result is less than Reporting Limit

Field Sampling Report

PIKA INTERNATIONAL, INC.

Project Name: Rocket Ridge

Location ID: RRP1-AA-PIT 05-001

Ravenna Army Ammunition Plant
Ravenna Ohio

Date: 8/17/09 **Weather** Sunny **Temperature** 89

Sampling Information

Source	Groundwater / Product		Surface Water		Soils / Sediments / Sludge			
Method	Bailer		Sample Bottle		Scoop	X	Trowel	
	Pump		Bacon Bomb		Bowl	X	Hand Auger	
	Micro-purge				Push Probe		Plastic Liner	
Type/Construction					Mattocks			
Miscellaneous	**Well Purging Form** Yes - No							

Sample Collection: 1500 hrs **Sample Type:** Composite - MI - (Grab) If MI, # of increments taken: _____ **Location:** Plotted on Map - (Staked in Field) Estimated - Measured - Surveyed

Sample Depth: 0-1' FT (below surface) **Decon:** (Dedicated) - Each Day - Each Location

Field Parameters (at time of sample)		Analytical Parameters				Other Parameters			
PID / FID Readings:		RVAAP Full Suite	X			Corrosivity			
Background:	ppm	~~Explosives~~ Explosives 8F	X			Reactivity Sulfide/Cyanide			
		Propellant	X			Ignitability			
Sample:	ppm	VOC's	X						
Water Level	FT	Reakt. Cyanide	X			**QA Samples**			
Temperature	°C	Reakt. Sulfide	X			MS/MSD	Yes / No		NA
Sp. Conductance:	uMHOs	Ignitability	X			Duplicate ID	Yes / No		NA
pH	units	PH	X			Equipment Rinse ID	Yes / No		NA
Turbidity	N.T.U.	% moist	X			Trip Blank ID	Yes / No		NA

Sample Description

Color: DK Brown **Odor:** None

Staining: few spots **Texture:** massive

Sorting: moderate **Plasticity** none

Moisture: Silty Sand & gravel

Soil sample description should include:

Munsell Color Odor Staining Texture Sorting Plasticity Moisture

Water sample description should include:

Color Odor Sheen Turbidity

Split Sample

Split Sample ID: _____

Name: _____

Agency/Company: _____

Address: _____

QA/QC Provided: MS/MSD - Duplicate - Trip Blanks - Field Blanks

Parameters: Same as Above - As Listed

Logged By: Shahram Taherinia (Please Print)

Signature: _____

Reviewed by: Sue Boles (Please Print)

Signature: Sue Boles Date: 9/9/09

Field Sampling Report

PIKA INTERNATIONAL, INC.

Project Name: Rocket Ridge

Location ID: RRP1-AA-PIT 09-001

Ravenna Army Ammunition Plant
Ravenna Ohio

Date: 8/17/09 **Weather** Sunny **Temperature** 89

Sampling Information

Source	Groundwater / Product		Surface Water		Soils / Sediments / Sludge			
Method	Bailer		Sample Bottle		Scoop	X	Trowel	
	Pump		Bacon Bomb		Bowl	X	Hand Auger	
	Micro-purge				Push Probe		Plastic Liner	
Type/Construction					Mattocks			
Miscellaneous	Well Purging Form Yes - No							

Sample Collection: 1515 hrs

Sample Type: Composite - MI - (Grab)
If MI, # of increments taken: _____

Location: Plotted on Map (Staked in Field)
Estimated - Measured - Surveyed

Sample Depth: 0-1' FT (below surface)

Decon: (Dedicated) - Each Day - Each Location

Field Parameters (at time of sample)		Analytical Parameters				Other Parameters			
PID / FID Readings:		RVAAP Full Suite	X	% moist	X	Corrosivity			
Background:	ppm	Perchlorates	~~X~~ SS			Reactivity Sulfide/Cyanide			
		Explosives	X			Ignitability			
Sample:	ppm	Propellant	X						
Water Level	FT	VOC's	X			**QA Samples**			
Temperature	°C	Reac Cyanide	X			MS/MSD	Yes / No		NA
Sp. Conductance:	uMHOs	Reac sulfide	X			Duplicate ID	Yes / No		NA
pH	units	Ignitibility	X			Equipment Rinse ID	Yes / No		NA
Turbidity	N.T.U.	PH	X			Trip Blank ID	Yes / No		NA

Sample Description

Color: DK brown **Odor:** none

Staining: some black **Texture:** massive

Sorting: moderate **Plasticity** None

Moisture: Silty sand & gravel

Soil sample description should include:

Munsell Color Odor Staining Texture Sorting Plasticity Moisture

Water sample description should include:

Color Odor Sheen Turbidity

Split Sample

Split Sample ID: _____

Name: _____

Agency/Company: _____

Address: _____

QA/QC Provided: MS/MSD - Duplicate - Trip Blanks - Field Blanks

Parameters: Same as Above - As Listed

Logged By: Shahram Taherinia (Please Print)

Signature: _____

Reviewed by: Sue Boles (Please Print)

Signature: Sue Boles Date: 9/9/09

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT05-001

HPLC

Lot-Sample #...: A9H180256-001 Work Order #...: LJCQ01AC Matrix.....: SO
Date Sampled...: 08/17/09 15:00 Date Received..: 08/18/09
Prep Date.....: 08/20/09 Analysis Date..: 08/27/09
Prep Batch #...: 9232263
Dilution Factor: 5
% Moisture.....: 30 Method.....: SW846 8330

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
1,3-Dinitrobenzene	0.50 J	1.2	mg/kg	0.25
2,4-Dinitrotoluene	0.55 J	1.2	mg/kg	0.10
2,6-Dinitrotoluene	0.35 J	1.2	mg/kg	0.15
Nitrobenzene	ND	1.2	mg/kg	0.25
Nitroglycerin	ND	2.5	mg/kg	0.65
1,3,5-Trinitrobenzene	10	1.2	mg/kg	0.10
2,4,6-Trinitrotoluene	71	1.2	mg/kg	0.10
HMX	0.62 J	1.2	mg/kg	0.15
RDX	2.2	1.2	mg/kg	0.20
Tetryl	ND	1.2	mg/kg	0.25
2-Nitrotoluene	ND	1.2	mg/kg	0.40
3-Nitrotoluene	ND	1.2	mg/kg	0.35
4-Nitrotoluene	ND	1.2	mg/kg	0.40
4-Amino-2,6-dinitrotoluene	3.1	1.2	mg/kg	0.10
2-Amino-4,6-dinitrotoluene	2.5	1.5	mg/kg	0.50
PETN	ND	2.5	mg/kg	0.80

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
3,4-Dinitrotoluene	104	(50 - 150)

NOTE(S):

J Estimated result. Result is less than RL.

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT05-001

HPLC

Lot-Sample #...:	A9H180256-001	**Work Order #...:**	LJCQ01AE	**Matrix.....:**	SO
Date Sampled...:	08/17/09 15:00	**Date Received..:**	08/18/09		
Prep Date.....:	08/20/09	**Analysis Date..:**	08/21/09		
Prep Batch #...:	9232291				
Dilution Factor:	1				
% Moisture.....:	30	**Method.....:**	SW846 8330 (Modif		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Nitroguanidine	ND	0.25	mg/kg	0.020

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT05-001

TCLP Metals

Lot-Sample #...: A9H180256-001 **Matrix.....:** SO
Date Sampled...: 08/17/09 15:00 **Date Received..:** 08/18/09
Leach Date.....: 08/19/09 **Leach Batch #..:** P923104

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 9232023						
Arsenic	ND	0.50	mg/L	SW846 6010B	08/20-08/24/09	LJCQ01AM
		Dilution Factor: 1		Analysis Time..: 12:19	Analyst ID.....: 000079	
		Instrument ID..: I5		MDL.....: 0.0032		
Barium	11.1	10.0	mg/L	SW846 6010B	08/20-08/24/09	LJCQ01AN
		Dilution Factor: 1		Analysis Time..: 12:19	Analyst ID.....: 000079	
		Instrument ID..: I5		MDL.....: 0.00067		
Cadmium	1.3	0.10	mg/L	SW846 6010B	08/20-08/24/09	LJCQ01AP
		Dilution Factor: 1		Analysis Time..: 12:19	Analyst ID.....: 000079	
		Instrument ID..: I5		MDL.....: 0.00066		
Chromium	ND	0.50	mg/L	SW846 6010B	08/20-08/24/09	LJCQ01AQ
		Dilution Factor: 1		Analysis Time..: 12:19	Analyst ID.....: 000079	
		Instrument ID..: I5		MDL.....: 0.0022		
Lead	22.2	2.5	mg/L	SW846 6010B	08/20-08/24/09	LJCQ01AR
		Dilution Factor: 5		Analysis Time..: 12:50	Analyst ID.....: 000079	
		Instrument ID..: I5		MDL.....: 0.0095		
Selenium	0.0056 B	0.25	mg/L	SW846 6010B	08/20-08/24/09	LJCQ01AT
		Dilution Factor: 1		Analysis Time..: 12:19	Analyst ID.....: 000079	
		Instrument ID..: I5		MDL.....: 0.0041		
Silver	ND	0.50	mg/L	SW846 6010B	08/20-08/24/09	LJCQ01AU
		Dilution Factor: 1		Analysis Time..: 12:19	Analyst ID.....: 000079	
		Instrument ID..: I5		MDL.....: 0.0022		
Mercury	ND	0.0020	mg/L	SW846 7470A	08/20/09	LJCQ01AV
		Dilution Factor: 1		Analysis Time..: 15:42	Analyst ID.....: 001576	
		Instrument ID..: H1		MDL.....: 0.00012		

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

B Estimated result. Result is less than RL.

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT05-001

GC/MS Volatiles

Lot-Sample #...:	A9H180256-001	**Work Order #...:**	LJCQ01AF	**Matrix.....:**	SO
Date Sampled...:	08/17/09 15:00	**Date Received..:**	08/18/09		
Prep Date.....:	08/20/09	**Analysis Date..:**	08/20/09		
Prep Batch #...:	9232490				
Dilution Factor:	1	**Initial Wgt/Vol:**	5 g	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	30	**Method.....:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Chloromethane	ND	7.1	ug/kg	0.58
Bromomethane	ND	7.1	ug/kg	0.77
Vinyl chloride	ND	7.1	ug/kg	0.56
Chloroethane	ND	7.1	ug/kg	1.2
Methylene chloride	ND	7.1	ug/kg	0.95
Acetone	ND	28	ug/kg	9.0
Carbon disulfide	ND	7.1	ug/kg	0.63
1,1-Dichloroethene	ND	7.1	ug/kg	0.74
1,1-Dichloroethane	ND	7.1	ug/kg	0.51
1,2-Dichloroethene (total)	ND	14	ug/kg	1.1
Chloroform	ND	7.1	ug/kg	0.41
1,2-Dichloroethane	ND	7.1	ug/kg	0.48
2-Butanone	ND	28	ug/kg	2.0
1,1,1-Trichloroethane	ND	7.1	ug/kg	0.80
Carbon tetrachloride	ND	7.1	ug/kg	0.53
Bromodichloromethane	ND	7.1	ug/kg	0.40
1,2-Dichloropropane	ND	7.1	ug/kg	0.98
cis-1,3-Dichloropropene	ND	7.1	ug/kg	0.48
Trichloroethene	ND	7.1	ug/kg	0.60
Dibromochloromethane	ND	7.1	ug/kg	0.78
1,1,2-Trichloroethane	ND	7.1	ug/kg	0.56
Benzene	ND	7.1	ug/kg	0.33
trans-1,3-Dichloropropene	ND	7.1	ug/kg	0.77
Bromoform	ND	7.1	ug/kg	0.47
4-Methyl-2-pentanone	ND	28	ug/kg	0.77
2-Hexanone	ND	28	ug/kg	0.90
Tetrachloroethene	ND	7.1	ug/kg	0.74
1,1,2,2-Tetrachloroethane	ND	7.1	ug/kg	0.48
Toluene	ND	7.1	ug/kg	0.38
Chlorobenzene	ND	7.1	ug/kg	0.47
Ethylbenzene	ND	7.1	ug/kg	0.37
Styrene	ND	7.1	ug/kg	0.21
Xylenes (total)	ND	14	ug/kg	0.95

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	97	(50 - 150)
1,2-Dichloroethane-d4	93	(50 - 150)
Toluene-d8	106	(50 - 150)
4-Bromofluorobenzene	97	(50 - 150)

(Continued on next page)

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT05-001

GC/MS Volatiles

Lot-Sample #...: A9H180256-001 Work Order #...: LJCQ01AF Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT05-001

TCLP GC/MS Volatiles

Lot-Sample #...:	A9H180256-001	**Work Order #...:**	LJCQ01CT	**Matrix.....:**	SO
Date Sampled...:	08/17/09 15:00	**Date Received..:**	08/18/09		
Leach Date.....:	08/19/09	**Prep Date.....:**	08/20/09	**Analysis Date..:**	08/20/09
Leach Batch #..:	P923103	**Prep Batch #...:**	9233300		
Dilution Factor:	1	**Initial Wgt/Vol:**	0.2 mL	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	30	**Method.....:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	0.025	mg/L	0.00013
2-Butanone (MEK)	ND	0.25	mg/L	0.00057
Carbon tetrachloride	ND	0.025	mg/L	0.00013
Chlorobenzene	ND	0.025	mg/L	0.00015
Chloroform	ND	0.025	mg/L	0.00016
1,2-Dichloroethane	ND	0.025	mg/L	0.00022
1,1-Dichloroethylene	ND	0.070	mg/L	0.00019
Tetrachloroethylene	ND	0.070	mg/L	0.00029
Trichloroethylene	ND	0.050	mg/L	0.00017
Vinyl chloride	ND	0.025	mg/L	0.00022

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	86	(50 - 150)
1,2-Dichloroethane-d4	83	(50 - 150)
Toluene-d8	86	(50 - 150)
4-Bromofluorobenzene	77	(50 - 150)

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT05-001

TCLP GC/MS Semivolatiles

Lot-Sample #...:	A9H180256-001	**Work Order #...:**	LJCQ01CU	**Matrix.....:**	SO
Date Sampled...:	08/17/09 15:00	**Date Received..:**	08/18/09		
Leach Date.....:	08/19/09	**Prep Date.....:**	08/20/09	**Analysis Date..:**	08/21/09
Leach Batch #..:	P923104	**Prep Batch #...:**	9236058		
Dilution Factor:	1	**Initial Wgt/Vol:**	250 mL	**Final Wgt/Vol..:**	2 mL
% Moisture.....:	30	**Method.....:**	SW846 8270C		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
o-Cresol	ND	0.0040	mg/L	0.00080
m-Cresol & p-Cresol	ND	0.040	mg/L	0.00075
1,4-Dichlorobenzene	ND	0.0040	mg/L	0.00034
2,4-Dinitrotoluene	ND	0.020	mg/L	0.00027
Hexachlorobenzene	ND	0.020	mg/L	0.00010
Hexachlorobutadiene	ND	0.020	mg/L	0.00027
Hexachloroethane	ND	0.020	mg/L	0.00080
Nitrobenzene	ND	0.0040	mg/L	0.000040
Pentachlorophenol	ND	0.040	mg/L	0.0024
Pyridine	ND	0.020	mg/L	0.00035
2,4,5-Trichloro-phenol	ND	0.020	mg/L	0.00030
2,4,6-Trichloro-phenol	ND	0.020	mg/L	0.00080

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	61	(29 - 111)
2-Fluorobiphenyl	57	(22 - 110)
Terphenyl-d14	77	(40 - 119)
Phenol-d5	51	(10 - 110)
2-Fluorophenol	55	(10 - 110)
2,4,6-Tribromophenol	55	(17 - 117)

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT05-001

TCLP GC Semivolatiles

Lot-Sample #...:	A9H180256-001	**Work Order #...:**	LJCQ01CV	**Matrix.....:**	SO
Date Sampled...:	08/17/09 15:00	**Date Received..:**	08/18/09		
Leach Date.....:	08/19/09	**Prep Date.....:**	08/20/09	**Analysis Date..:**	08/20/09
Leach Batch #..:	P923104	**Prep Batch #...:**	9236055		
Dilution Factor:	1	**Initial Wgt/Vol:**	250 mL	**Final Wgt/Vol..:**	3 mL
% Moisture.....:	30	**Method.....:**	SW846 8081A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Chlordane (technical)	ND	0.0050	mg/L	0.000033
Endrin	ND	0.00050	mg/L	0.000011
Heptachlor	ND	0.00050	mg/L	0.0000080
Heptachlor epoxide	ND	0.00050	mg/L	0.0000071
Lindane	ND	0.00050	mg/L	0.0000064
Methoxychlor	ND	0.0010	mg/L	0.000032
Toxaphene	ND	0.020	mg/L	0.00032

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	62	(47 - 110)
Decachlorobiphenyl	76	(31 - 115)

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT05-001

TCLP GC Semivolatiles

Lot-Sample #...:	A9H180256-001	**Work Order #...:**	LJCQ01CW	**Matrix.....:**	SO
Date Sampled...:	08/17/09 15:00	**Date Received..:**	08/18/09		
Leach Date.....:	08/19/09	**Prep Date.....:**	08/20/09	**Analysis Date..:**	08/24/09
Leach Batch #..:	P923104	**Prep Batch #...:**	9236053		
Dilution Factor:	1	**Initial Wgt/Vol:**	100 mL	**Final Wgt/Vol..:**	10 mL
% Moisture.....:	30	**Method.....:**	SW846 8151A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
2,4-D	ND	0.50	mg/L	0.0015
2,4,5-TP (Silvex)	ND	0.10	mg/L	0.00016

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2,4-Dichlorophenylacetic acid	65	(37 - 116)

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT05-001

General Chemistry

Lot-Sample #...: A9H180256-001 Work Order #...: LJCQ0 Matrix.....: SO
Date Sampled...: 08/17/09 15:00 Date Received..: 08/18/09
% Moisture.....: 30

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)	7.6		No Units	SW846 9045C	08/19/09	9231495
		Dilution Factor: 1		MDL.....:		
Acid-soluble sulfide	ND	42.7	mg/kg	SW846 9030B/9034	08/20/09	9232092
		Dilution Factor: 1		MDL.....: 31.3		
Cyanide, Total	2.0	0.71	mg/kg	SW846 9012A	08/21/09	9233312
		Dilution Factor: 1		MDL.....: 0.14		
Flashpoint at 140 de gF	>140		deg F	SW846 1020B	08/21/09	9233376
		Dilution Factor: 1		MDL.....:		
Nitrocellulose	35.5	5.0	mg/kg	MCAWW 353.2	08/20-08/21/09	9232252
		Dilution Factor: 1		MDL.....: 0.78		
Percent Solids	70.2	10.0	%	MCAWW 160.3 MOD	08/19-08/20/09	9231276
		Dilution Factor: 1		MDL.....: 10.0		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT09-001

HPLC

Lot-Sample #...: A9H180256-002 Work Order #...: LJCRT1AD Matrix.....: SO
Date Sampled...: 08/17/09 15:15 Date Received..: 08/18/09
Prep Date.....: 08/20/09 Analysis Date..: 08/27/09
Prep Batch #...: 9232263
Dilution Factor: 0.99
% Moisture.....: 49 Method.....: SW846 8330

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
1,3-Dinitrobenzene	ND	0.25	mg/kg	0.050
2,4-Dinitrotoluene	0.078 J	0.25	mg/kg	0.020
2,6-Dinitrotoluene	0.031 J	0.25	mg/kg	0.030
Nitrobenzene	ND	0.25	mg/kg	0.050
Nitroglycerin	ND	0.50	mg/kg	0.13
1,3,5-Trinitrobenzene	1.3 PG	0.25	mg/kg	0.020
2,4,6-Trinitrotoluene	2.6	0.25	mg/kg	0.020
HMX	0.072 J	0.25	mg/kg	0.030
RDX	0.46	0.25	mg/kg	0.040
Tetryl	ND	0.25	mg/kg	0.050
2-Nitrotoluene	ND	0.25	mg/kg	0.079
3-Nitrotoluene	ND	0.25	mg/kg	0.069
4-Nitrotoluene	ND	0.25	mg/kg	0.079
4-Amino-2,6-dinitrotoluene	1.8	0.25	mg/kg	0.020
2-Amino-4,6-dinitrotoluene	1.2	0.30	mg/kg	0.099
PETN	ND	0.50	mg/kg	0.16

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
3,4-Dinitrotoluene	97	(50 - 150)

NOTE(S):

J Estimated result. Result is less than RL.

PG The percent difference between the original and confirmation analyses is greater than 40%.

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT09-001

HPLC

Lot-Sample #...:	A9H180256-002	**Work Order #...:**	LJCRT1AF	**Matrix.....:**	SO
Date Sampled...:	08/17/09 15:15	**Date Received..:**	08/18/09		
Prep Date.....:	08/20/09	**Analysis Date..:**	08/21/09		
Prep Batch #...:	9232291				
Dilution Factor:	1				
% Moisture.....:	49	**Method.....:**	SW846 8330 (Modif		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Nitroguanidine	ND	0.25	mg/kg	0.020

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT09-001

TCLP Metals

Lot-Sample #...: A9H180256-002 Matrix.....: SO
Date Sampled...: 08/17/09 15:15 Date Received..: 08/18/09
Leach Date.....: 08/19/09 Leach Batch #..: P923104

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 9232023						
Arsenic	0.0085 B	0.50	mg/L	SW846 6010B	08/20-08/24/09	LJCRT1AN
		Dilution Factor: 1		Analysis Time..: 12:41	Analyst ID.....: 000079	
		Instrument ID..: I5		MDL.....: 0.0032		
Barium	0.78 B	10.0	mg/L	SW846 6010B	08/20-08/24/09	LJCRT1AP
		Dilution Factor: 1		Analysis Time..: 12:41	Analyst ID.....: 000079	
		Instrument ID..: I5		MDL.....: 0.00067		
Cadmium	0.70	0.10	mg/L	SW846 6010B	08/20-08/24/09	LJCRT1AQ
		Dilution Factor: 1		Analysis Time..: 12:41	Analyst ID.....: 000079	
		Instrument ID..: I5		MDL.....: 0.00066		
Chromium	0.0027 B	0.50	mg/L	SW846 6010B	08/20-08/24/09	LJCRT1AR
		Dilution Factor: 1		Analysis Time..: 12:41	Analyst ID.....: 000079	
		Instrument ID..: I5		MDL.....: 0.0022		
Lead	0.034 B	0.50	mg/L	SW846 6010B	08/20-08/24/09	LJCRT1AT
		Dilution Factor: 1		Analysis Time..: 12:41	Analyst ID.....: 000079	
		Instrument ID..: I5		MDL.....: 0.0019		
Selenium	ND	0.25	mg/L	SW846 6010B	08/20-08/24/09	LJCRT1AU
		Dilution Factor: 1		Analysis Time..: 12:41	Analyst ID.....: 000079	
		Instrument ID..: I5		MDL.....: 0.0041		
Silver	ND	0.50	mg/L	SW846 6010B	08/20-08/24/09	LJCRT1AV
		Dilution Factor: 1		Analysis Time..: 12:41	Analyst ID.....: 000079	
		Instrument ID..: I5		MDL.....: 0.0022		
Mercury	ND	0.0020	mg/L	SW846 7470A	08/20/09	LJCRT1AW
		Dilution Factor: 1		Analysis Time..: 15:45	Analyst ID.....: 001576	
		Instrument ID..: H1		MDL.....: 0.00012		

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

B Estimated result. Result is less than RL.

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT09-001

GC/MS Volatiles

Lot-Sample #...:	A9H180256-002	**Work Order #...:**	LJCRT1AG	**Matrix.....:**	SO
Date Sampled...:	08/17/09 15:15	**Date Received..:**	08/18/09		
Prep Date.....:	08/20/09	**Analysis Date..:**	08/20/09		
Prep Batch #...:	9232490				
Dilution Factor:	1	**Initial Wgt/Vol:**	5 g	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	49	**Method.....:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Chloromethane	ND	9.8	ug/kg	0.80
Bromomethane	ND	9.8	ug/kg	1.1
Vinyl chloride	ND	9.8	ug/kg	0.76
Chloroethane	ND	9.8	ug/kg	1.7
Methylene chloride	ND	9.8	ug/kg	1.3
Acetone	ND	39	ug/kg	12
Carbon disulfide	ND	9.8	ug/kg	0.86
1,1-Dichloroethene	ND	9.8	ug/kg	1.0
1,1-Dichloroethane	ND	9.8	ug/kg	0.70
1,2-Dichloroethene (total)	ND	20	ug/kg	1.5
Chloroform	ND	9.8	ug/kg	0.57
1,2-Dichloroethane	ND	9.8	ug/kg	0.66
2-Butanone	ND	39	ug/kg	2.7
1,1,1-Trichloroethane	ND	9.8	ug/kg	1.1
Carbon tetrachloride	ND	9.8	ug/kg	0.72
Bromodichloromethane	ND	9.8	ug/kg	0.55
1,2-Dichloropropane	ND	9.8	ug/kg	1.3
cis-1,3-Dichloropropene	ND	9.8	ug/kg	0.66
Trichloroethene	ND	9.8	ug/kg	0.82
Dibromochloromethane	ND	9.8	ug/kg	1.1
1,1,2-Trichloroethane	ND	9.8	ug/kg	0.76
Benzene	ND	9.8	ug/kg	0.45
trans-1,3-Dichloropropene	ND	9.8	ug/kg	1.1
Bromoform	ND	9.8	ug/kg	0.65
4-Methyl-2-pentanone	ND	39	ug/kg	1.1
2-Hexanone	ND	39	ug/kg	1.2
Tetrachloroethene	ND	9.8	ug/kg	1.0
1,1,2,2-Tetrachloroethane	ND	9.8	ug/kg	0.66
Toluene	ND	9.8	ug/kg	0.53
Chlorobenzene	ND	9.8	ug/kg	0.65
Ethylbenzene	ND	9.8	ug/kg	0.51
Styrene	ND	9.8	ug/kg	0.29
Xylenes (total)	ND	20	ug/kg	1.3

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	101	(50 - 150)
1,2-Dichloroethane-d4	92	(50 - 150)
Toluene-d8	94	(50 - 150)
4-Bromofluorobenzene	67	(50 - 150)

(Continued on next page)

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT09-001

GC/MS Volatiles

Lot-Sample #...: A9H180256-002 Work Order #...: LJCRT1AG Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT09-001

TCLP GC/MS Volatiles

Lot-Sample #...:	A9H180256-002	**Work Order #...:**	LJCRT1A3	**Matrix.....:**	SO
Date Sampled...:	08/17/09 15:15	**Date Received..:**	08/18/09		
Leach Date.....:	08/19/09	**Prep Date.....:**	08/20/09	**Analysis Date..:**	08/20/09
Leach Batch #..:	P923103	**Prep Batch #...:**	9233300		
Dilution Factor:	1	**Initial Wgt/Vol:**	0.2 mL	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	49	**Method.....:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	0.025	mg/L	0.00013
2-Butanone (MEK)	ND	0.25	mg/L	0.00057
Carbon tetrachloride	ND	0.025	mg/L	0.00013
Chlorobenzene	ND	0.025	mg/L	0.00015
Chloroform	ND	0.025	mg/L	0.00016
1,2-Dichloroethane	ND	0.025	mg/L	0.00022
1,1-Dichloroethylene	ND	0.070	mg/L	0.00019
Tetrachloroethylene	ND	0.070	mg/L	0.00029
Trichloroethylene	ND	0.050	mg/L	0.00017
Vinyl chloride	ND	0.025	mg/L	0.00022

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	86	(50 - 150)
1,2-Dichloroethane-d4	83	(50 - 150)
Toluene-d8	89	(50 - 150)
4-Bromofluorobenzene	81	(50 - 150)

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT09-001

TCLP GC/MS Semivolatiles

Lot-Sample #...:	A9H180256-002	**Work Order #...:**	LJCRT1A4	**Matrix.....:**	SO
Date Sampled...:	08/17/09 15:15	**Date Received..:**	08/18/09		
Leach Date.....:	08/19/09	**Prep Date.....:**	08/20/09	**Analysis Date..:**	08/21/09
Leach Batch #..:	P923104	**Prep Batch #...:**	9236058		
Dilution Factor:	1	**Initial Wgt/Vol:**	250 mL	**Final Wgt/Vol..:**	2 mL
% Moisture.....:	49	**Method.....:**	SW846 8270C		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
o-Cresol	ND	0.0040	mg/L	0.00080
m-Cresol & p-Cresol	ND	0.040	mg/L	0.00075
1,4-Dichlorobenzene	ND	0.0040	mg/L	0.00034
2,4-Dinitrotoluene	ND	0.020	mg/L	0.00027
Hexachlorobenzene	ND	0.020	mg/L	0.00010
Hexachlorobutadiene	ND	0.020	mg/L	0.00027
Hexachloroethane	ND	0.020	mg/L	0.00080
Nitrobenzene	ND	0.0040	mg/L	0.000040
Pentachlorophenol	ND	0.040	mg/L	0.0024
Pyridine	ND	0.020	mg/L	0.00035
2,4,5-Trichloro-phenol	ND	0.020	mg/L	0.00030
2,4,6-Trichloro-phenol	ND	0.020	mg/L	0.00080

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	62	(29 - 111)
2-Fluorobiphenyl	55	(22 - 110)
Terphenyl-d14	72	(40 - 119)
Phenol-d5	49	(10 - 110)
2-Fluorophenol	55	(10 - 110)
2,4,6-Tribromophenol	46	(17 - 117)

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT09-001

TCLP GC Semivolatiles

Lot-Sample #...:	A9H180256-002	**Work Order #...:**	LJCRT1A5	**Matrix.....:**	SO
Date Sampled...:	08/17/09 15:15	**Date Received..:**	08/18/09		
Leach Date.....:	08/19/09	**Prep Date.....:**	08/20/09	**Analysis Date..:**	08/20/09
Leach Batch #..:	P923104	**Prep Batch #...:**	9236055		
Dilution Factor:	1	**Initial Wgt/Vol:**	250 mL	**Final Wgt/Vol..:**	3 mL
% Moisture.....:	49	**Method.....:**	SW846 8081A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Chlordane (technical)	ND	0.0050	mg/L	0.000033
Endrin	ND	0.00050	mg/L	0.000011
Heptachlor	ND	0.00050	mg/L	0.0000080
Heptachlor epoxide	ND	0.00050	mg/L	0.0000071
Lindane	ND	0.00050	mg/L	0.0000064
Methoxychlor	ND	0.0010	mg/L	0.000032
Toxaphene	ND	0.020	mg/L	0.00032

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	88	(47 - 110)
Decachlorobiphenyl	88	(31 - 115)

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT09-001

TCLP GC Semivolatiles

Lot-Sample #...:	A9H180256-002	**Work Order #...:**	LJCRT1A6	**Matrix.....:**	SO
Date Sampled...:	08/17/09 15:15	**Date Received..:**	08/18/09		
Leach Date.....:	08/19/09	**Prep Date.....:**	08/20/09	**Analysis Date..:**	08/24/09
Leach Batch #..:	P923104	**Prep Batch #...:**	9236053		
Dilution Factor:	1	**Initial Wgt/Vol:**	100 mL	**Final Wgt/Vol..:**	10 mL
% Moisture.....:	49	**Method.....:**	SW846 8151A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
2,4-D	ND	0.50	mg/L	0.0015
2,4,5-TP (Silvex)	ND	0.10	mg/L	0.00016

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2,4-Dichlorophenylacetic acid	75	(37 - 116)

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

PIKA International, Inc.

Client Sample ID: RRP1-AA-PIT09-001

General Chemistry

Lot-Sample #...: A9H180256-002 Work Order #...: LJCRT Matrix.....: SO
Date Sampled...: 08/17/09 15:15 Date Received..: 08/18/09
% Moisture.....: 49

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)	8.6		No Units	SW846 9045C	08/19/09	9231495
		Dilution Factor: 1		MDL.....:		
Acid-soluble sulfide	ND	58.7	mg/kg	SW846 9030B/9034	08/20/09	9232092
		Dilution Factor: 1		MDL.....: 43.0		
Cyanide, Total	5.5	0.98	mg/kg	SW846 9012A	08/21/09	9233312
		Dilution Factor: 1		MDL.....: 0.20		
Flashpoint at 140 de gF	>140		deg F	SW846 1020B	08/21/09	9233376
		Dilution Factor: 1		MDL.....:		
Nitrocellulose	13.7	5.0	mg/kg	MCAWW 353.2	08/20-08/21/09	9232252
		Dilution Factor: 1		MDL.....: 0.78		
Percent Solids	51.1	10.0	%	MCAWW 160.3 MOD	08/19-08/20/09	9231276
		Dilution Factor: 1		MDL.....: 10.0		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

APPENDIX K

Demolition Shot Logs

PIKA

PIKA DEMOLITION SHOT RECORD

Site Name/Location: RVAAP			Date: 29 Jul 09
Shot Location (OB/OD Range, Bldg or Grid No.): Rocket Ridge	Demolition Supervisor: Mel Lau		State License # (if applicable):
Type of UXO/OE Destroyed, Vented or Burned: 105mm HE w/M51 series T-Bar		Firing Method: Electric	Time of Shot: 10:15
Direction and Distance to Nearest Building, Road, Utility Line, etc.: 2501'		Temp: 67 Wind Dir./Speed: 0-3E Ceiling: 3500 Clouds/% Sun: 40%	
Type and Amount of Tamping Used:		Mat or Other Protection Used (list): Sand Bag Mitigation	
Seismographic / Sound Level Meter Used: Yes G No G		Readings / Results:	

Demolition Materials Used

Description	Amount	Description	Amount
Perforator	2 ea.	Time Fuze	
Det Cord	100'	Squibs	
Electric Detonator	2 ea	Black / Smokeless Powder	
Non-electric Detonator		Two Component	
Non-El Detonator		Other (list)	

Certification

I certify that the explosives listed were used for their intended purpose, and that the MEC listed was rendered inert/destroyed.

Signature of Demolition Supervisor: Mel Lau Date: 29 Jul 09

PIKA

PIKA DEMOLITION SHOT RECORD

Site Name/Location: RVAAP			Date: 29 Jul 09
Shot Location (OB/OD Range, Bldg or Grid No.): Rocket Ridge	Demolition Supervisor: Mel Lang		State License # (if applicable):
Type of UXO/OE Destroyed, Vented or Burned: clean-up shot		Firing Method: Electric	Time of Shot: 10:50
Direction and Distance to Nearest Building, Road, Utility Line, etc.: 2501'		Temp: 67 Ceiling: 3500	Wind Dir./Speed: 0-3E Clouds/% Sun: 40%
Type and Amount of Tamping Used:			Mat or Other Protection Used (list):
Seismographic / Sound Level Meter Used: Yes G No G		Readings / Results:	

Demolition Materials Used

Description	Amount	Description	Amount
Perforator		Time Fuze	
Det Cord	4100'	Squibs	
Electric Detonator	23 ea	Black / Smokeless Powder	
Non-electric Detonator		Two Component	
Non-El Detonator		Other (list)	

Certification

I certify that the explosives listed were used for their intended purpose, and that the MEC listed was rendered inert/destroyed.

Signature of Demolition Supervisor: Mel Lang Date: 29 Jul 09