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14. ABSTRACT

This Draft Investigation Report describes the activities performed to complete the Scope of Work (SOW) for the Compliance Restoration (CR) Site CC-RVAAP-80 and Other Environmental Services at the Ravenna Army Ammunition Plant (RVAAP) in Ravenna, Ohio.

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DRAFT INVESTIGATION REPORT FOR THE COMPLIANCE RESTORATION SITE CC-RVAAP-80 GROUP 2 PROPELLANT CAN TOPS AND OTHER ENVIRONMENTAL SERVICES

Ravenna Army Ammunition Plant (RVAAP)
Ravenna, Ohio

Contract No. W912QR-10-P-0058

Submitted to

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NGB – National Guard Bureau

OHARNG – Ohio Army National Guard - Camp Ravenna

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

PIKA – PIKA International Inc.

REIMS – Ravenna Environmental Information Management System

RVAAP – Ravenna Army Ammunition Plant

USACE – United States Army Corps of Engineers – Louisville District

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LIST OF ACRONYMS

AOC	Area of Concern
APP	Accident Prevention Plan
BRACD	United State Base Realignment and Closure Division
CELRL	USACE - Louisville District, Louisville, Kentucky
CR	Compliance Restoration
DOD	Department of Defense
EZ	Exclusion Zone
FM	Facility Manager
FWCUGs	Facility Wide Cleanup Goals
GOCO	Government Owned, Contractor Operated
GPS	Global Positioning System
GPR	Ground Penetrating Radar
HAZWOPER	Hazardous Waste Operations and Emergency Response
HTRW	Hazardous Toxic and Radioactive Waste
IAW	In Accordance With
IDW	Investigation Derived Waste
IRP	Installation Restoration Program
LL	Load Line
m	meter
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
MI	Multi-Increment

1	mm	millimeter
2	MSD	Minimum Separation Distance
3	NGB	National Guard Bureau
4	Ohio EPA	Ohio Environmental Protection Agency
5	OHARNG	Ohio Army National Guard
6	OSHA	Occupational Safety and Health Administration
7	PAM	Pamphlet
8	PIKA	PIKA International, Inc.
9	PjM	Project Manager
10	QC	Quality Control
11	RRD	Range Related Debris
12	RSL	Regional Screening Level
13	RVAAP	Ravenna Army Ammunition Plant
14	SOW	Scope of Work
15	SSHP	Site Safety and Health Plan
16	SUXOS	Senior Unexploded Ordnance Supervisor
17	USACE	United States Army Corps of Engineers
18	USEPA	United States Environmental Protection Agency
19	USP&FO	United States Property and Fiscal Officer
20	UXO	Unexploded Ordnance
21	UXOSO	Unexploded Ordnance Safety Officer
22	UXOT III	Unexploded Ordnance Technician III/Team Leader
23	VOC	volatile organic compound

1	WP	Work Plan

1.0 INTRODUCTION

This report describes the activities performed to complete the Scope of Work (SOW) for the Compliance Restoration (CR) Site CC-RVAAP-80 and Other Environmental Services at the Ravenna Army Ammunition Plant (RVAAP) in Ravenna, Ohio. Authorization for performance is contained in contract W912QR-10-P-0058 issued to PIKA International, Inc. (PIKA) by U.S. Army Corps of Engineers - Louisville District (CELRL), Louisville, Kentucky. A copy of the SOW is presented in Appendix A.

The Report describes the procedures, operational sequence, and resources PIKA used for the following tasks:

- Perform a geophysical delineation of the buried or near surface materials (propellant can tops, etc.) in the designated Group 2 areas;
- Collect surface soil samples based on the results of the geophysical delineation;
- Analyze soil samples for the common propellants used by the Department of Defense (DoD) including Nitrocellulose, Nitroglycerine, Nitroguanidine, and Perchlorate, with one (1) of the samples also analyzed for the RVAAP full suite (i.e., Explosives, Propellants, TAL Metals, VOCs. SVOCs, Pesticides, PCBs and Mercury) and Cyanide;
- Dispose of all Investigation Derived Waste (IDW); and
- Pump and remove accumulated water from the excavation at RVAAP Load Line (LL) 2 Building DB-802 in accordance with Ohio Environmental Protection Agency (Ohio EPA) requirements for ground application.

1.1 Objective

The objective of this project was to conduct an initial investigation of the Group 2 Propellant Can Tops areas. The following objectives were achieved during the investigation:

- Delineate the boundaries of the propellant can top areas;

- Confirm the presence or absence of releases of propellants and/or other munitions constituents (MC) to the surface soils at this area of concern (AOC); and
- Remove accumulated water from the excavation at LL2 Building DB-802 to facilitate completion of scheduled site restoration operations by others under a separate United States Base Realignment and Closure Division (BRACD) contract.

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 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 southeast; Charlestown to the southwest; and Wayland 4.8 kilometers (3 miles) to the south.

When RVAAP was operational, 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 to load and pack major caliber artillery ammunition and to assemble 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 (3) LLs and two (2) component lines in support of the Southeast Asia Conflict. These facilities were deactivated in August 1972. The demilitarization of the M71A1 90 millimeter (MM) 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, RVAAP was placed in inactive caretaker status and subsequently changed to modified caretaker status. The LLs and associated real estate were determined to be excess to the U.S. 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 Camp Ravenna. RVAAP and Camp Ravenna are co-located on contiguous parcels of property. Camp Ravenna perimeter fence encloses both installations.

1.4 RVAAP – CC-RVAAP-80: Group 2 Propellant Can Tops

CC-RVAAP-80 consists of the Group 2 Propellant Can Tops area. Propellant can lids or tops were identified on the ground surface/near surface at the southern end of the former Group 2 Ammunition Storage Area. These materials are typically classified as Range-Related Debris (RRD) (similar to munitions packaging materials). This site was never used or classified as an operational range. It is believed that the discarded propellant can tops might qualify as inert scrap metal.

The propellant can tops located at the south end of Group 2 were initially identified by OHARNG trainees in the winter of 2008. The propellant can tops were observed in the vegetated area located immediately south of the ammunition storage magazines in the vicinity of the southern railroad spur lines (see Appendix B, Figure 3). This area consists of approximately 539,572 square feet (12.4 acres).

The CELRL performed an emergency survey with a metal detector over a portion of the southern area ground surface. Results of the survey revealed multiple magnetic anomalies in the surface and near surface soils. On-site Unexploded Ordnance (UXO) personnel visually identified the surface anomalies as propellant can tops. During the emergency survey, it was also noted that the ground surface had been disturbed and contained hummocks (mounds) ranging in height from one (1) foot to two (2) feet throughout the survey area.

As such, the propellant can tops or RRD are of environmental concern for the subject area. A geophysical survey was necessary to identify the anomalies and anomalous areas within the subject area, and to characterize the subject area boundary(ies). The limited soil investigation within the identified anomalous areas was warranted to assess possible releases of propellants or MC to the surface soils in the vicinity of the can tops. The site is a low probability site in regard to encountering munitions and explosives of concern (MEC). Therefore, only UXO construction support was required for this project.

1.5 RVAAP- 09: Load Line 2

Former excavation activities conducted at LL2 (RVAAP-09) have resulted in the accumulation of water within the Building DB-802 footprint. To facilitate restoration activities at this location, the accumulated water needed to be removed from the excavation to assist in the restoration of the site. A site showing the location of Building DB-802 within LL2 is presented in Appendix B, Figure 4.

NOTE: As per the requirements of the SOW, the water removal services were to coincide with the BRACD contractor's schedule. To that end, the water removal services were conducted by PIKA from May 3, 2010, through May 18, 2010, to facilitate the June 2010 restoration activities at LL2 by the BRACD contractor. All water removal services were conducted in accordance with Ohio EPA requirements. A copy of the Ohio EPA e-mail correspondence relative to approval for discharging the surface water to ground surface is provided in Appendix F.

2.0 COMPLIANCE RESTORATION SITE CC-RVAAP-80 SITE INVESTIGATION ACTIVITIES

The following documents were prepared and approved prior to starting the Compliance Restoration Site CC-RVAAP-80 (Group 2 Propellant Can Tops) site investigation operations:

- February 25, 2011, "Final Project Work Plan for the Compliance Restoration Site CC-RVAAP-80 Group 2 Propellant Can Tops and Other Environmental Services"
- December 17, 2010, "Final Project Management Plan for the Compliance Restoration Site CC-RVAAP-80 Group 2 Propellant Can Tops and Other Environmental Services"
- February 2011, "Final Accident Prevention Plan for the Compliance Restoration Site CC-RVAAP-80 Group 2 Propellant Can Tops and Other Environmental Services"
- February 2011, "Final Site Safety and Health Plan for the Compliance Restoration Site CC-RVAAP-80 Group 2 Propellant Can Tops and Other Environmental Services"
- February 2011, "Final Sampling and Analysis Plan for the Compliance Restoration Site CC-RVAAP-80 Group 2 Propellant Can Tops and Other Environmental Services"
- February 2011, "Final Quality Assurance Project Plan for the Compliance Restoration Site CC-RVAAP-80 Group 2 Propellant Can Tops and Other Environmental Services"

The sequence of operations for the Group 2 Propellant Can Tops site investigation as approved in the work plan (WP) was:

- Mobilization and site preparation – Conducted 4 through 6 April 2011;

- Surface sweep – Conducted 7 – 14 April 2011;
- Mark wetland boundaries – Conducted 21 April 2011
- Vegetation Removal – Conducted 26 April through 5 May 2011;
- Geophysical Delineation of Group 2 Propellant Can Tops area – Conducted 9 through 11 May 2011;
- Multi-Increment (MI) surface soil sampling within areas identified as containing propellant can tops – Conducted 26 May 2011;
- Disposal of IDW – Conducted 26 May 2011;
- Survey boundaries of MI sample areas – Conducted 31 May 2011;
- Demobilization – Conducted 31 May 2011, and
- Data Validation – Conducted 28 June through 5 July 2011

Details pertaining to each of the Group 2 Propellant Can Tops site investigation operations are provided in the subsections that follow. Photographic documentation of the Group 2 Propellant Can Tops site investigation 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

PIKA scheduled the arrival of the work force in a manner designed to facilitate immediate productivity. All PIKA personnel mobilized to the site met requirements for Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) training and medical surveillance requirements as specified in the Accident Prevention Plan (APP)/Site Safety and Health Plan (SSHP). Site personnel were trained to perform the specific tasks to

which they were assigned. At no time were site personnel tasked with performing an operation or duty for which they did not have appropriate training and experience.

2.1.2 Preliminary Activities

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

- Coordinated with the RVAAP Facility Manager (FM) and Camp Ravenna Range Control to finalize access and communications requirements for operations within the Group 2 area;
- Contacted and coordinated with local vendors for accommodations as well as vendors/suppliers for routine purchases to ensure smooth project start up; and
- Inspected the 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 proper working order. All instruments and equipment that required routine maintenance and/or calibration were checked initially upon arrival and then checked again prior to use each day. As part of the initial equipment set-up and testing, PIKA also installed and tested its communication equipment to include the following:

- Cellular Phone Service to maintain communication with RVAAP security personnel.
- Hand-held portable radios used to maintain communications between the Project Manager (PjM) and the UXO Technician III (UXOT III)/Team Leader.
- Cellular telephones equipped with Direct Connect Service (very high frequency band) to be used as back up communications between the PjM and the UXOT III/Team Leader.

- Prior to initiating site activities, PIKA coordinated communication with Camp Ravenna Range Control, including information relative to planned road blocks, as needed.

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 and the Camp Ravenna Group 2 site. Individual assigned responsibilities and safety and environmental concerns associated with site operations were also covered in the training. The Senior UXO Supervisor (SUXOS)/UXO Safety Officer (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 WP and APP/SSHP as they related to the tasks that were 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 the location of wetlands.
- Additional OSHA or CELRL required training per the approved APP.
- Identification features, hazards, and disposal methods of MEC/UXO that may be encountered.

2.1.5 Permitting

No permits were identified to be required for the execution of work under this scope of work.

2.1.6 Tenant Relocation

PIKA worked with the RVAAP FM in conjunction with the Camp Ravenna Range Control in order to minimize any effects caused by the performance of any/all of the operational tasks conducted during the Group 2 Propellant Can Tops site investigation. However, upon arrival to the site for conducting the surface sweep operations, it was noted that OHARNG training operations were being conducted within the northwest area of the site adjacent to Building AA-150. As such, tenant relocation was required prior to initiating site operations.

2.1.7 Site Control

The site was a low probability site in regard to encountering MEC and only UXO "construction support" was required for the project. As such, in accordance with (IAW) Engineering Pamphlet 75-1-2, *Munitions and Explosives of Concern (MEC) Support During Hazards, Toxic, and Radioactive Waste (HTRW) and Construction Activities, a* Minimum Separation Distances (MSD) was not required; however, as a precaution, PIKA instituted a 200-foot diameter exclusion zone (EZ) during the investigation operations for site control and site security purposes. This consisted of establishing barriers including warning cones and yellow tape to control the points of site access along strategic points of the Group 2 access roads. All personnel non-essential to the field activities complied with the limits of EZ.

2.2 Surface Sweep

Prior to initiating the brush clearing and geophysical delineation operations, the PIKA on site UXO technicians conducted an instrument-assisted surface sweep of the entire Group 2 Propellant Can Tops site. The surface sweep was conducted using Schonstedt GA-52Cx metal detectors and a XLT-E Series all whites metal detector to

locate and mark any MEC items that could have been present at the site. No MEC items were found. The surface sweep activities were conducted 7 through 14 April 2011. Photo documentation of the surface sweep activities are provided in the weekly reports contained in Appendix C.

2.3 Marking Wetlands

Prior to initiating the vegetation removal and site investigation operations, PIKA located and marked the existing wetlands at the site to ensure protection throughout the site investigation operations. The boundaries of the wetlands were located by a licensed surveyor on 21 April 2011 using survey data provided by Ms. Katie Tait, Camp Ravenna Environmental Specialist. A map showing the location of the wetlands within Group 2 Propellant Can Tops site is presented in Appendix B as Figure 5. Photo documentation of the surveying operations are provided in the weekly reports contained in Appendix C.

2.4 Vegetation Removal

PIKA conducted vegetation removal operations at the Group 2 Propellant Can Top Area to facilitate the site investigation operations. The vegetation removal operations were conducted from 26 April through 6 May 2011 and included the removal of ground level vegetation and small trees. Vegetation removal was conducted using a tractor mounted brush cutter with the deck locked in position at six (6)-inches above ground level. Prior to and during vegetation removal, UXO Technicians visually searched the area where the vegetation was removed to ensure the area was free of surface MEC/UXO items or other items that may have presented a physical hazard. No MEC/UXO items were encountered during the brush clearing operations. Photo documentation of the vegetation removal operations is provided in the weekly reports contained in Appendix C.

2.5 Geophysical Delineation of Group 2 Propellant Can Tops Site

PIKA subcontracted GeoSearches, Inc., located in Chagrin Falls, Ohio to conduct the geophysical survey of the Group 2 Propellant Can Top Area. The objective of the

survey was to delineate the boundaries of the propellant can top areas within the site. The geophysical survey of the Group 2 Propellant Can Top Area was conducted 9 through 13 May 2011.

The geophysical survey was conducted using Electromagnetics (EM61-MK2). Prior to initiating the geophysical activities, a surveyed grid consisting of 100-foot by 100-foot grids was installed across the site to facilitate the investigation. During the geophysical survey, detected anomalies were surveyed utilizing the Global Positioning System (GPS)-integrated EM61 for generating data maps and then marked in the field using colored pin flags to aid in selection of the surface soil samples. At the completion of the geophysical survey operations, a total of five (5) distinct high anomaly density areas (i.e., anomaly clusters) were delineated at the site. Each of these areas was located roughly within the center portion of the site, stretching south to north. Individual anomalies were also detected across the site, but primarily in the southeastern and northwestern regions of the site. Figure 6 in Appendix B shows the location and layout of the anomalies and anomaly clusters delineated within Group 2.

A number of propellant can tops and/or cans were visible on the surface within each of the delineated cluster areas, most notably within cluster areas 1, 3, and 5. A few of the individual anomalies detected outside the cluster areas were also visible on the surface but only within the southeast portion of the site and one near the center of the site along the rail bed. These visible individual detections were identified as propellant cans and/or tops. None of the individual anomalies detected within the northwest region of the site were visible. A photo log showing the propellant can tops and cans within each cluster area as well as the individual propellant cans and tops that were visible on the surface is presented in Appendix H.

Upon delineating the boundaries of the propellant can tops cluster areas, Ground Penetrating Radar (GPR) was used to determine the approximate depth of the anomalies within each cluster area in order to determine if there was any evidence of potential excavation and/or dumping operations. Results of the GPR data indicate that all of the anomalies within the five (5) cluster areas exist at the surface or within near surface soils at no more than nine (9)-inches in depth. Additionally,

there were no signs of disturbance within the subsurface lithology (i.e., signs of excavation and dumping).

Details pertaining to all of the geophysical survey operations are provided in the GeoSearches survey report provided in Appendix D. Photo documentation of the geophysical delineation activities are provided in the weekly reports contained in Appendix C.

2.6 Multi-Increment Surface Soil Sampling

Based upon results of the geophysical survey, MI surface soil samples were collected within the boundaries of selected anomaly cluster areas in order to assess possible releases of propellant MC to the surface soils from the propellant can tops and cans. As per the SOW, a total of three (3) biased MI surface soil samples were collected and analyzed for the common propellants used by DoD, including Nitrocellulose, Nitroglycerine, Nitroguanidine and Perchlorate. Additionally, one of the samples was analyzed for the RVAAP full suite. A PIKA UXO team consisting of two UXO Technicians provided construction oversight services during all sampling operations IAW Engineering Pamphlet 75-1-2, *Munitions and Explosives of Concern (MEC) Support During Hazards, Toxic, and Radioactive Waste (HTRW) and Construction Activities*.

Prior to collecting the samples, a site walk was conducted on 25 May 2011 with representatives from the Ohio EPA and PIKA to evaluate each of the anomaly cluster areas for selecting the three (3) MI sample areas. Based upon site observations including size of the area and amount of visible propellant cans and tops within each area, anomaly cluster areas 1, 3 and 5 were selected for sampling and are identified as MI sample Area 3, MI sample Area 2, and MI sample Area 1, respectively. The locations along with the corresponding MI sample identifications for each of the identified sample areas are provided in Appendix B, Figure 7. The surface soil sampling operations were conducted on 26 May 2011. Photo documentation of the MI surface soil sampling activities is provided in the weekly reports contained in Appendix C.

For each sampling location, a minimum of 30 random aliquots were collected from zero (0) to one (1) foot below ground surface (bgs) using a ¾ inch diameter dedicated stainless steel step probe, placed in a plastic lined container, and mixed in the field. The aliquot locations were selected by the sample technician walking over the entire area and randomly selecting aliquot locations, which were marked with flagging. All the aliquots collected from each MI sample area were placed in a labeled container for transport to the laboratory. At the laboratory, the samples were dried, sieved, and finely ground for specific constituent analysis. All three (3) of the MI samples were analyzed for Nitrocellulose, Nitroglycerine, Nitroquanidine and Perchlorate. Additionally, one of the samples was also analyzed for the RVAAP full suite. Sample PCTss-002M-001-SO within MI sample Area 2 was selected for the RVAAP full suite due to the large amount of propellant can tops and propellant cans present relative to Areas 1 and 3. IAW the SAP, the MI sampling method was not utilized for the volatile organic compounds (VOC) component of this RVAAP full suite sample. Instead, one discrete sample was collected from within the MI sample Area 2. The location of the discrete sample was biased toward the area most likely to contain volatile compounds. No soil staining or other obvious signs of potential VOC contamination was observed within MI sample Area 2 so the discrete sample was biased toward the section of MI sample Area 2 which contained the heaviest concentration of propellant can top debris items. The soil portion for the discrete sample for the VOC analyte was placed directly in the sample container and was not composited or further processed in the field or laboratory.

The boundaries of each of the MI sample areas were surveyed on 31 May 2011 to document the layout and location within Group 2 for future use as needed. The total area for each of the MI sample areas is as follows:

MI sample area 1 equals 198 square meters;
MI sample area 2 equals 553 square meters; and
MI sample area 3 equals 330 square meters.

A map showing the surveyed limits of the MI sample boundaries is provided in Appendix B, Figure 8. A copy of laboratory sample results for all the samples,

including QC samples (i.e., duplicate, equipment rinsate, and MS/MSD), is provided in Appendix E.

2.7 Summary of Surface Soil Sample Results

A tabulated summary of all the sample results are provided in Tables 1 and 2, Appendix E. All the sample results have been compared to the established Facility Wide Cleanup Goals (FWCUGs) for National Guard Trainee, Regional Screening Level (RSL), and the established Surface Soil Background Criteria. A narrative summary of the results is provided below:

1. None of the samples (including the RVAAP full suite sample) reported detectable concentrations of the chemicals of concern above the established FWCUGs.
2. The RVAAP full suite sample (MI sample Area 2, Sample PCTss-002M-0001) did show detectable concentrations for five (5) metal analytes (arsenic, lead, mercury, vanadium, zinc) that are slightly above the RSL and/or Surface Soil Background Criteria.
3. Both perchlorate and propellants were reported at MI Sample Area 1 (sample PCTss-001M-0001-SO); including the associated duplicate sample, and also at MI Sample Area 3 (sample PCTss-003M-0001-SO), however each result was flagged as estimated because the target analytes were detected at concentrations below the reporting limit.

2.8 Disposal of IDW

The MI surface soil samples were collected using pre-decontaminated, dedicated, ¾-inch stainless steel step probes. Additionally, all the soils generated from the 30 aliquots at each of the MI sample areas were included with the samples that were sent to the laboratory and all the results indicate that none of the samples reported detectable concentrations of the chemicals of concern above the established FWCUGs. As such, no IDW was generated that required disposal.

2.9 Data Validation

The analytical methods employed during the implementation of the Group 2 site investigation operations are defined in the Facility-Wide Sampling and Analysis Plan and Facility-Wide Quality Assurance Project Plan for the RVAAP. A listing of all the analytical methods used for this project are provided in Appendix G. All of the Group 2 sample analysis was performed by Test America in Sacramento, CA. Laboratory results included documentation verifying compliance with sample log-in procedures, analytical holding times, and quality control procedures for analyses. The laboratory also provides information about the percent of recovery attained in laboratory spike samples, calibration curves (initial and continuing) dilutions, and detection limits. The laboratory flagged data if results warranted.

All sample results were systematically verified and validated by Purves Environmental in Hudson, OH in accordance with the United States Environmental Protection Agency (USEPA) Test Methods for evaluating Solid Waste SW-846, National Function Guidelines for Data Validation, and The US Army Corps Louisville Chemistry Guideline, Version 5.0. The validation process was conducted to ensure that the precision and accuracy of the analytical data were adequate for their intended use. The validation process minimized the potential of using false results in the decision-making process and ensured that detected and non-detected compounds were accurately identified.

Data validation determined that all samples were properly analyzed, diluted as needed, quantitated and that no problems were encountered with the system performance of any of the instruments. As such, data validation determined that all data are 100 percent complete and usable. A copy of the data validation reports is provided in Appendix G.

2.10 Demobilization

Upon completion of the tasks covered under this SOW, PIKA demobilized from the site on 31 May 2011. The demobilization activities consisted of the following steps:

1. Remove/demobilize all PIKA equipment.
2. Demobilize any other remaining equipment and supplies.
3. Demobilize personnel.

3.0 CONCLUSIONS

The objectives of this project were to:

- Delineate the boundaries of the propellant can top areas;
- Confirm the presence or absence of releases of propellants and/or other MC to the surface soils at the Group 2 Propellant can Tops site; and
- Remove accumulated water from the excavation at Building DB-802 (LL2) to facilitate completion of scheduled site restoration operations by others.

The defined objectives were achieved through completion of the SOW as summarized below:

1. The water removal services were conducted by PIKA from May 3, 2010, through May 18, 2010, to facilitate the June 2010 restoration activities at LL2 by the BRACD contractor. All water removal services were conducted in accordance with Ohio EPA requirements. A copy of the Ohio EPA e-mail correspondence relative to approval for discharging the surface water to ground surface is provided in Appendix F.
2. Based upon geophysical survey a total of five (5) distinct high anomaly cluster areas were delineated within the Group 2 Propellant Can Tops site. Individual anomalies were also detected across the site outside of the delineated cluster areas, primarily within the southeastern and northwestern regions of the site as shown on Figure 6, Appendix B. Based upon visual observations within the delineated cluster areas it is evident that the detected anomalies are comprised almost exclusively of propellant can tops and/or propellant cans. Additionally, of the individual anomalies detected that were visible on the surface, each was identified as a propellant can and/or top. It is unlikely that the remaining shallow subsurface anomalies detected within the northwestern and southeastern portions of the site are MEC or munitions debris (MD) given the fact that none of these type items were encountered either during the precautionary surface sweep operations conducted prior to the brush clearing operation, or during the course of any of the subsequent site investigation operations. However, further investigation (i.e., geophysical

and/or anomaly digs with UXO support) of at least a percentage of the subsurface individual anomalies may be warranted for verification.

3. Results of the GPR data within the five (5) cluster areas indicate that all of the anomalies exist at the surface or within near surface soils at no more than nine (9)-inches in depth and that there were no signs of disturbance within the subsurface lithology (i.e., no signs of excavation and burial).
4. Based upon visual observation of the five (5) delineated cluster areas, one MI surface soil sample was collected from each of the three cluster areas identified as having the most propellant cans and tops present in order to confirm the presence or absence of releases of propellants and/or other MC to the surface soils. The sample results indicate that none of the samples reported detectable concentrations of the chemicals of concern above the established FWCUGs. The RVAAP full suite sample (MI sample Area 2, Sample PCTss-002M-0001) did show detectable concentrations for five (5) metal analytes (arsenic, lead, mercury, vanadium, zinc) that are slightly above the RSL and/or Surface Soil Background Criteria. Both perchlorate and propellants were reported at MI Sample Area 1 (sample PCTss-001M-0001-SO); including the associated duplicate sample, and also at MI Sample Area 3 (sample PCTss-003M-0001-SO), however each result was flagged as estimated below the reporting limit and screening criteria. None of the samples reported detectable concentrations of the chemicals of concern above the established FWCUGs.
5. From the results and based upon site observations, it is it is likely that the two (2) cluster areas that were not sampled during this investigation (i.e., cluster areas 1 and 4 as depicted on Figure 6 in Appendix B) would show similar sample results. Collecting surface soil sampling within the individual anomaly areas located in the northwestern and southeastern portions of the site would likely be contingent upon results of any further investigation operations conducted in these areas.

Appendix A

Scope of Work

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SCOPE OF WORK

FOR

COMPLIANCE RESTORATION SITE CC-RVAAP-80

AND OTHER ENVIRONMENTAL SERVICES

RAVENNA ARMY AMMUNITION PLANT

RAVENNA, OHIO

22 MARCH 2010

The Louisville District, U.S. Army Corps of Engineers (USACE) is requesting environmental services as described in this Scope of Work (SOW) at the former Ravenna Army Ammunition Plant (RVAAP).

Compliance Restoration (CR) site CC-RVAAP-80 (Group 2 Propellant Can Lids) is potentially impacted by range-related debris (RRD) and/or chemical residues of munitions or munitions constituents (MC). Response actions are required under the Defense Environmental Restoration Program (DERP), Installation Restoration Program (IRP) to further identify these materials and investigate this AOC. The SOW identifies specific requirements that will be completed by the Contractor.

This SOW also identifies other services required of the Contractor. This portion of the SOW pertains to water removal services at Load Line 2.

1.0 GENERAL INFORMATION

1.1 Site Description and Location

Past Department of Defense (DoD) activities at the former RVAAP date back to 1940 and include the manufacturing, loading, handling, and storing of military explosives and ammunition. Until 1999, the RVAAP was identified as a 21,419-acre installation. The Ohio Army National Guard (OHARNG) resurveyed the property boundary, finishing in 2003, and the actual total acreage was found to be 21,683.289 acres. As of February 2006, a total of 20,403 acres of the former 21,683-acre RVAAP have been transferred to the National Guard Bureau (NGB) via the United States Property and Fiscal Officer (USP&FO) for Ohio and subsequently licensed to the OHARNG for use as a training site. Currently, RVAAP consists of 1,280 acres in several distinct parcels scattered throughout the confines of the OHARNG's Camp Ravenna Joint Military Training Center (Camp Ravenna). RVAAP's remaining parcels of land are located completely within the Camp Ravenna perimeter fence. The RVAAP facility is controlled by the U.S. Army Base Realignment and Closure Division (BRACD).

Camp Ravenna/RVAAP is located in northeastern Ohio within Portage and Trumbull Counties, approximately 4.8 kilometers (three miles) east/northeast of the City of Ravenna and approximately 1.6 kilometers (one mile) northwest of the Village of Newton Falls. The RVAAP portions of the property are located completely within Portage County. Camp Ravenna (inclusive of RVAAP) is a parcel of property approximately 17.7 kilometers (11 miles) long and 5.6 kilometers (3.5 miles) wide. The facility is bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad on the south; Garrett, 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 (six miles) to the northwest; Newton Falls 1.6 kilometers (one mile) to the southeast; Charlestown to the southwest, and Wayland 4.8 kilometers (three miles) to the south. The property location is depicted in Figure 1.

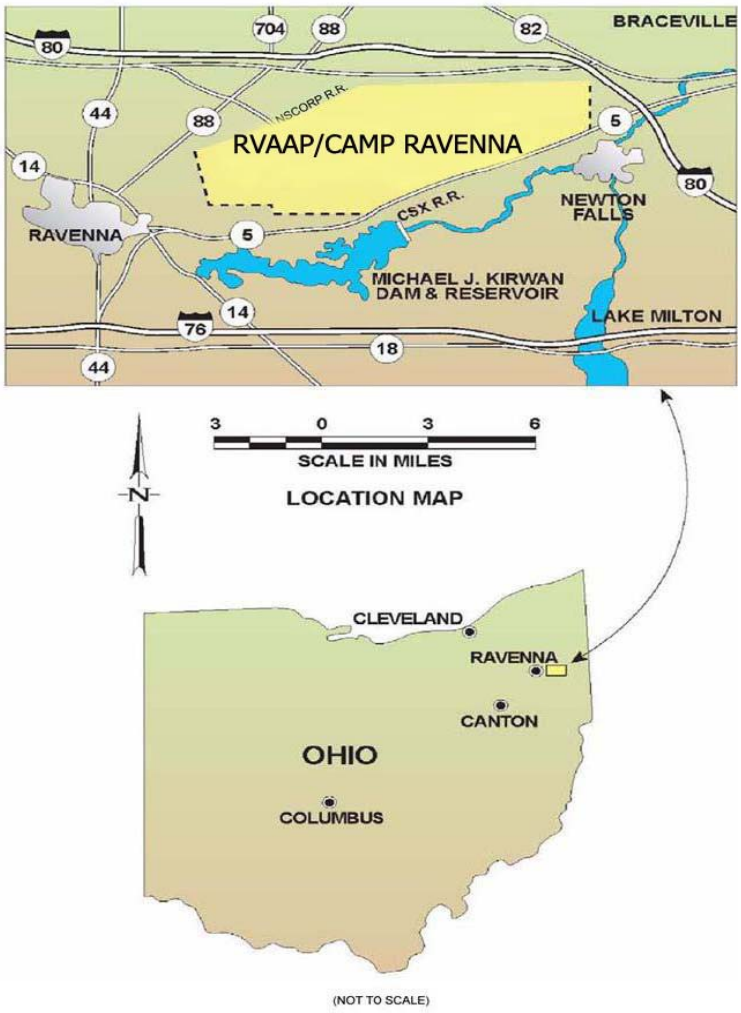


Figure 1. RVAAP/Camp Ravenna Location and General Vicinity Maps

Camp Ravenna did not exist when the RVAAP was operational, and the entire 21,683-acre parcel was a GOCO industrial facility. The RVAAP BRACD sites encompass investigation and clean up of past activities over the entire 21,683 acres of the former RVAAP. Therefore, references to the RVAAP in this document shall include the historical extent of the RVAAP, inclusive of the combined acreages of the current Camp Ravenna and RVAAP, unless otherwise specifically stated.

1.2 Areas of Concern

CC-RVAAP-80: Group 2 Propellant Can Lids

CC-RVAAP-80 consists of the Group 2 Propellant Can Lids area. Propellant can lids or tops were identified on the ground surface/near surface at the southern and northern ends of the former Group 2 Ammunition Storage Area. These materials are typically classified as RRD

(similar to munitions packaging materials); however, this site was never used or classified as an operational range. It is believed that the discarded propellant can lids might qualify as inert scrap metal.

The propellant can lids located at the south end of Group 2 were initially identified by Ohio Army National Guard trainees in the winter of 2008. The propellant can lids were observed in the vegetative area located immediately south of the ammunition storage magazines in the vicinity of the southern railroad spur lines. This area consists of approximately 539,572 square feet (12.4 acres). Reportedly, propellant can lids were also identified at the northern end of the Group 2 area by the Ohio Army National Guard. The reported northern area consists of approximately 43,418 square feet (1 acre).

The Louisville District USACE performed an emergency survey with a metal detector of a portion of the southern area ground surface. Results of the initial investigation revealed multiple magnetic anomalies in the surface and near surface soils. On-site UXO personnel visually identified the surface anomalies as propellant can lids or tops. During the emergency survey it was also noted that the ground surface had been disturbed and contained hummocks (mounds) ranging in height from 1' to 2' throughout the survey area.

As such, the propellant can lids (or RRD) are of environmental concern for the subject area. A geophysical survey is necessary to identify the anomalies and anomalous areas within the subject area, and to characterize the subject area boundary(s).

The anomalies and anomalous areas should be clearly marked during the field survey in order to facilitate a limited soil investigation, and possible future clean up activities. The limited soil investigation is warranted to assess possible releases of propellants (MC) to the surface soils in the vicinity of the can lids.

The site is a low probability site in regards to encountering munitions and explosives of concern (MEC). Therefore, only unexploded ordinance (UXO) construction support will be needed for this project. However, if prior to this project or during any phase of this project MEC are found at the site, the project may be stopped and the site will need to be re-evaluated and potentially assigned a new probability rating.

RVAAP-09: Load Line 2

Former excavation activities conducted at Load Line 2 (RVAAP-09) have resulted in the accumulation of water within the building DB-802 footprint. Restoration activities are now planned at this location, and the accumulated water needs to be removed from the excavation to assist in the restoration of the site.

2.0 PROJECT OBJECTIVES

The objective of this project is to conduct an initial investigation of the above-described Group 2 Propellant Can Lids areas. The investigation shall achieve the following objectives:

- Delineate the boundaries of the propellant can lid areas
- Confirm the presence or absence of releases of propellants and/or other MC to the surface soils at this AOC

Project objectives and the SOW associated with the water removal services at Load Line 2 are described in Section 8.0. Other portions of this document pertain to the activities and requirements associated with the Group 2 Propellant Can Lids areas.

3.0 GENERAL REQUIREMENTS

The Contractor shall possess all the required expertise, knowledge, equipment and tools required to perform the work described in this SOW in accordance with established industry standards. The Contractor shall be responsible for and shall furnish all labor, materials, plant, equipment, and supplies necessary to fully execute the Firm Fixed-Price work described herein within the contract performance period (see Section 4.0).

The Contractor shall perform all environmental services pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and National Oil and Hazardous Substances Contingency Plan (NCP) requirements, and coordinating with the Ohio Environmental Protection Agency (EPA) as appropriate. The installation is not on the National Priorities List (NPL).

The Contractor shall comply with all applicable federal, state, and local rules, laws, and regulations. The Contractor shall fulfill the work described in this SOW in a manner that is consistent with any applicable orders or permits, all cleanup agreements or guidance for the Facility, and relevant DoD and Army policy that exist or may become effective during the performance of this contract. This specifically includes the Director's Final Findings & Orders (DFFO), which the Army and Ohio EPA agreed to in 2004. The DFFO establishes certain criteria that apply to the relationship between the Army and Ohio EPA, including but not limited to approval authority, document review schedules, and various agency responsibilities. All work performed shall conform to the DFFO.

3.1 Government Property

All documents, maps, photographs, graphics, mailing lists, radio telemetry transmitters, computer files and the like developed by the Contractor while completing the requirements of this SOW are government property and will be delivered to the facility Point of Contact (POC) upon completion of this project.

3.2 Data Security

The Contractor shall not release any data, reports, or materials collected and/or developed during this project without the expressed written consent of the U.S. Army Corps of Engineers (USACE).

3.3 Deliverables and Document Format

The Contractor shall prepare and submit the following project management documents:

- Project Management Plan (PMP) including a Quality Control Plan (QCP)

In addition (but not limited to), the Contractor shall prepare the following project specific documents (as applicable) in support of the IRA:

- Work Plan (WP)
- Sampling and Analysis Plan (SAP)
- Site Safety and Health Plan (SSHP)
- Quality Assurance Project Plan (QAPP)
- Report of Findings and Conclusions

The Work Plan documents can be developed as Addenda to the approved Facility-Wide documents; however, references to the Facility-Wide documents should be held to a minimum with respect to describing actual field assessment activities. The Work Plan should be treated as the body of the report while the above associated plans are entered as tabbed sections (or incorporated by reference).

The above documents are subject to stakeholder review and approval. All documents shall be submitted by the Contractor in preliminary draft, draft, and final format. The number of documents and their distribution is described below:

Preliminary Draft Documents

Organization	Number of Paper Copies	Number of Electronic Copies
USACE	4	4
RVAAP	2	2
Ohio Army National Guard	1	1
REIMS	1	1

Draft Documents

Organization	Number of Paper Copies	Number of Electronic Copies
USACE	4	4

RVAAP	4	2
Ohio EPA	2	2
Ohio Army National Guard	1	1
REIMS	1	1

Final Documents

Organization	Number of Paper Copies	Number of Electronic Copies
USACE	4	4
RVAAP	4	2
Ohio EPA	2	2
Ohio Army National Guard	2	2
REIMS	1	1

The Army, through the Contracting Officer's Representative (COR), will receive preliminary draft documents from the Contractor and will provide review comments to the Contractor within thirty business days. Once preliminary draft comments are addressed, the Army will review draft and final documents concurrently with the other stakeholders. The Contractor shall ensure that review and response periods are consistent with the applicable regulatory drivers (see DFFO). All documents shall be identified as draft until completion of stakeholder coordination, when they will be signed and finalized. One copy of the final documents shall be placed in both the project repositories and Administrative Record (for CERCLA documents).

All documents shall be submitted in electronic and printed format in accordance with the latest version of the document entitled "Ravenna Army Ammunition Plant Deliverable Document Formatting Guidelines." The referenced document is available and can be downloaded from www.rvaap.org/docs/pub/Formatting_Guidelines.pdf.

All reports are to be typed. Field notes shall be reviewed for quality assurance (QA) and then be submitted in handwritten form. Other handwritten field originals shall also be included in the reports.

In addition, final electronic document files must be in text-searchable PDF format and be accompanied by defined metadata for upload into the Army Repository of Environmental Documents (READ).

The contractor shall secure a USACE approved laboratory that can provide analytical data in the USACE Automatic Data Review (ADR) electronic format. All samples collected and analyzed under this agreement shall be provided in the referenced electronic data deliverable (EDD) format. The project-specific library file must be maintained to accurately reflect all of the analytical quality and will be provided to both the USACE and the sub-contract laboratory for use in screening EDD submittals.
Data review must comply with the procedures outlined in the Louisville Quality System Manual (QSM) Supplement and provide compatibility with data management software, at minimum, Environmental Data Management System (EDMS) software. The Contractor shall set up

libraries in ADR/EDMS for deriving site constituents of potential concern (COPCs). The contractor is responsible for keeping ADR current.

All electronic data submitted by the contract laboratory is required to be error-free, and in complete agreement with the hardcopy data. Data files are to be delivered both by e-mail and/or high density CD accompanying the hardcopy data reports. The disk must be submitted with a transmittal letter from the laboratory that certifies the file is in agreement with hardcopy data reports and has been found to be free of errors using the latest version of the ADR evaluation software provided to the laboratory. The contract laboratory, at its cost, will correct any errors identified by the USACE, Louisville District.

All documents shall be provided in electronic format for posting to the Ravenna Environmental Information Management System (REIMS). All analytical data shall also be provided in EDD format for posting to REIMS. REIMS is currently administered by Mr. Patrick Ryan of SAIC. Mr. Ryan can be contacted at (865) 481-4664. The Contractor shall coordinate with Mr. Ryan to ensure proper sample numbering, EDD formatting, etc.

All project documents must meet the approval of the USACE. Project documents must also meet the approval of the Ohio Environmental Protection Agency (EPA) and all other stakeholders in compliance with the DFFO, and the most current version of the RVAAP Deliverable Document Format Guidelines.

3.4 Electronic Data Files

Currently the Louisville District standards for software are MicroStation Version 8 (.dgn) and MS Office Version 2003 Professional. These products are to be considered the default software of choice unless otherwise specified within individual task order scopes of work, as determined by individual customer requirements or as the District incorporates updated versions of its software.

CADD Files: When required and requested in a task order, all CADD files (survey and topographic data, remedial action design drawings, contaminant migration maps and models, etc.) shall be digitized into files compatible with Microstation vector format (or other format if directed in the individual task order). Specific design file features will be provided in the individual task orders. CADD files shall also meet any upgrade to all Corps of Engineers systems throughout the duration of the contract.

GIS Files: When required and requested in a task order, all GIS files (survey and topographic data, remedial action data collected, contaminant migration maps generated, etc.) shall be submitted compatible with Environmental Systems Research Institute (ESRI) 9.x (shape files or personal geodatabases) format (or other format if directed in the individual task order). All GIS data shall be made compliant to the Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE) version 2.6 (http://www.sdsfie.org/). Specific GIS file features will be provided in the individual task orders. GIS files shall also meet any upgrade to all Corps of Engineers systems throughout the duration of the contract. All GIS data shall be collected using the local State Plane coordinate system using the North American Datum of 1983 and the North

American Vertical Datum of 1988. All files shall be collected using linear units of US Survey feet for both the horizontal and vertical.

Electronic Files: All final reports and documents, including laboratory analysis data, shall be submitted on CD/DVD. Report documents shall be in Adobe (pdf) format, and shall be accompanied by the Contractor's associated work files.

3.5 Conducting Meetings

Unless otherwise specified, the Contractor shall arrange and conduct all meetings required by this SOW. Unless otherwise specified, the installation shall provide facilities for meetings.

3.6 Project Stake Holders

For the purposes of this SOW, project stakeholders include the Army, Ohio Army National Guard, National Guard Bureau, Ohio EPA, the Restoration Advisory Board (RAB), and the general public. The Contractor's required level of involvement may differ for each AOC/Site, and the Contractor shall be responsible for obtaining comments with appropriate approval or concurrence on project deliverables consistent with applicable regulatory drivers and agreements for each AOC/CR site.

4.0 STATEMENT OF WORK

CLIN No. 1 – The Contractor shall implement and complete an initial environmental investigation at Compliance Restoration site CC-RVAAP-80, the Group 2 Propellant Can Lids Areas.

CLIN No. 2 – The Contractor shall provide water removal services as described at Load Line 2.

The Contractor is encouraged to become thoroughly familiar with all programmatic and scheduling requirements contained in this SOW as well as the DFFO in order to prepare the cost proposal. The Contractor is also encouraged to attend a preliminary site visit at the RVAAP facility with the USACE, other Army representatives, and the Ohio EPA. The purpose of the site visit is to familiarize the Contractor with the AOC/CR sites, and to provide other relative information (as applicable) necessary for the Contractor to prepare the cost proposal.

The following additional details and assumptions should also be considered in the preparation of the cost proposal:

- All of the access routes on the subject property are managed by the Ohio Army National Guard (OHARNG). Additionally, the primary AOC listed in this SOW is located on OHARNG property. Military training and other OHARNG activities are priority on OHARNG property. Contractor activities must be coordinated with the OHARNG through Mr. Mark Patterson, the BRACD Facility Manager.

- Contractor is subject to OHARNG security and access procedures.

- Contractor may not disturb soil, water, vegetation, buildings, equipment or animals without prior coordination and approval of the OHARNG.

- Contractor is responsible for repairing damage to any roads, soil, vegetation, drainage, or otherwise caused by their activities on or adjacent to OHARNG property.

All work performed on this SOW shall follow the Contractor's approved Project Management Plan (PMP), and shall be performed in accordance with the following existing documents (if applicable) developed for the facility (or updates to the existing documents, if applicable):

- Ohio EPA's Director's Final Findings and Orders (DFFO) for RVAAP (Ohio EPA 2004)

- RVAAP's Facility-Wide Human Health Risk Assessor Manual (USACE 2004)

- Facility-Wide Ecological Risk Assessment Work Plan (USACE 2003a)

- Facility-Wide Sampling & Analysis Plan and Quality Assurance Project Plan (USACE 2001b)
- Facility-Wide Safety and Health Plan (USACE 2001a)
- Facility-Wide Groundwater Monitoring Program Plan (Portage 2004)
- RVAAP Community Relations Plan (USACE 2003b)
- RVAAP Final Position Paper for the Application and Use of Facility-Wide Human Health Cleanup Goals (USACE 2009)

The above documents are available for review online at http://www.rvaap.org. Following contract award, the Contractor may direct questions to the USACE by contacting Mr. Derek Kinder at 502-315-6393.

4.1 CLIN No. 1 – Environmental Investigation at Compliance Restoration Site CC-RVAAP-80.

The detailed Tasks for this SOW are discussed in the following sections.

Task 1.0: Project Management

The Contractor shall provide a Project Manager qualified to oversee all work described in the SOW. The Project Manager shall serve as the single point of contact (POC) and liaison for all work required. All work shall be accomplished with adequate internal controls and review procedures to eliminate conflicts, errors, and omissions and to ensure the accuracy of all work completed under this SOW. The Contractor shall accept direction only from the USACE Contracting Officer (KO) or the designated COR. Any changes to this SOW must be authorized in writing by the KO.

Task 1.1: Project Management Plan (PMP)

Contractor shall develop a Preliminary Draft PMP within 30 days of contract award. The PMP shall summarize Contractor's overall technical and management approach for this project. The PMP shall also include the summary of work to be performed and project schedule, project team roles and responsibilities, and a deliverable matrix in accordance with the project performance objectives.

The PMP shall also include a Quality Control Plan (QCP). The QCP will be developed to define how quality control will be executed for products and performance of work activities by all personnel, including subcontractors.

Upon receipt of USACE comment responses, Contractor shall submit a Draft PMP for stakeholder review and approval. The Contractor shall submit the Final PMP within 30 calendar

days of receipt of COR comments on the draft document or in compliance with the schedule specified by the Ohio EPA. Schedules specified by the Ohio EPA will take precedence over the USACE schedule. Army approval is achieved through the COR, and Ohio EPA approval is achieved through receipt of EPA documentation confirming PMP approval.

Task 1.2: Site Safety and Health Plan (SSHP)

Contractor shall develop a Preliminary Draft Site-Specific Safety and Health Plan (SSHP) addenda for each appropriate task of the project. The SSHP will be presented as an addendum to the Facility-Wide Health and Safety Plan (USACE 2001a). The SSHP Addendum will address task hazard analyses, emergency response, contingency plans, and emergency contacts. The SSHP will include UXO avoidance services. The SSHP will meet the requirements of federal, state, and local regulations and will identify safety and health regulations applicable to the work. The Preliminary Draft SSHP shall be submitted to the USACE within 30 calendar days of contract award.

Upon receipt of USACE comment responses, Contractor shall submit a Draft SSHP for stakeholder review and approval. The Contractor shall submit the Draft SSHP within 30 calendar days of receipt of COR comments on the draft document or in compliance with the schedule specified by the Ohio EPA. Schedules specified by the Ohio EPA will take precedence over the USACE schedule. Army approval is achieved through the COR. The Ohio EPA may provide review and comment on the SSHP; however, does not approve health and safety documents for USACE Contractors.

Task 1.3: Project Execution/Client Correspondence

The following activities and deliverables shall be performed in support of this project:

- Project Kick-Off Meeting
- Monthly Progress Reports
- Records of Conversations
- Teleconference Progress Updates
- Meeting Minutes Documentation
- Public Involvement / RAB Meetings

The above activities will be conducted by the Contractor to achieve project execution, and maintain client correspondence with the USACE. These activities are discussed in further detail below.

Task 1.3.1: Project Kick-Off Meeting - Upon Army and Ohio EPA approval of the PMP and SSHP, the Contractor shall implement and attend an initial Project Kick-Off Meeting at the RVAAP facility. The Contractor shall present the details of the PMP, the SSHP, and the anticipated approach to conducting the IRA Activities. The Kick-Off Meeting is intended to assist the Contractor with the submittal and stake holder approval of the related Work Plan documents.

Task 1.3.2: Monthly Progress Reports - The Contractor shall submit monthly written progress reports to the USACE for every month by the fifth (5^{th}) day of the following month. The monthly reports will include an accurate and current account of all work completed and deliverables furnished to the government. Progress reports will be prepared following the described sections presented in Section XVI of the DFFO. Contractor's payment invoices may accompany the monthly progress reports.

Task 1.3.3: Records of Conversations - The Contractor shall prepare and maintain records of telephone conversations and significant verbal conversations conducted in support of this project. These records will be forwarded with monthly progress reports.

Task 1.3.4: Teleconference Progress Updates - The Contractor shall attend periodic teleconference progress meetings with the USACE to provide project status updates. The progress update meetings are currently held on a biweekly basis.

Task 1.3.5: Meeting Minutes Documentation - The Contractor shall document discussions at all meetings held in support of this project. Meeting minutes will be typed, and distributed to the USACE and installation POCs within 7 calendar days following the meeting.

Task 1.3.6: Public Involvement / RAB Meetings – The Contractor should note that the Installation has an active Restoration Advisory Board (RAB) and detailed information concerning the RAB's organization and activities will be provided to the Contractor. The Contractor shall attend a minimum of one (1) applicable RAB meeting during the specified period of performance at the direction of the COR.

All public participation coordination shall be approved by the Army through the Facility Manager and the COR. The Contractor shall provide the necessary support to initiate, schedule, and address all public participation aspects of the project (e.g., preparation of briefings, presentations, fact sheets, newsletters, articles/public notices to news media, and notifications to RAB members). The Contractor shall be responsible for requesting and addressing all public comments consistent with the applicable regulatory drivers. The USACE COR, or designee, will attend and represent the Army at all meetings with the public.

Task 2.0: Preparation of Work Plan and Supporting Documents

The Contractor shall prepare a work plan (WP) and the necessary supporting documents to implement and complete an initial environmental investigation at the designated Group 2 Propellant Can Lid Areas. The investigation shall consist of a geophysical delineation of the designated areas, and a limited soil investigation of the surface soils in these areas.

Consistent with the RVAAP Deliverable Document Format Guidelines, the deliverables shall consist of the WP, the Sampling and Analysis Plan (SAP), the Site Safety and Health Plan (SSHP as discussed in Task 1.2), and the Quality Assurance Project Plan (QAPP). The WP documents shall follow the most recent version of the outline specified in the RVAAP Deliverable Document Format Guidelines.

The following paragraphs describe the requirements associated with the Contractor's development of the WP documents:

Contractor shall develop a Preliminary Draft WP, SAP and QAPP within 60 days of approval of the final PMP. The SAP and QAPP will be developed as an Addendum, tiered under the existing RVAAP Facility-Wide SAP (USACE 2001b), to comply with USACE and Ohio EPA requirements.

All analytical work shall be performed in accordance with the most recent version of the DOD Quality System Manual (QSM). Sampling objectives will be established and the appropriate method will be identified to satisfy the performance objectives. The chemical analytical laboratory must be selected and included in all QAPP deliverables. No sampling activities shall commence until all plans are approved.

Upon receipt of USACE comment responses, Contractor shall submit a Draft SAP and QAPP for stakeholder review and approval. The Contractor shall submit the Final documents within 30 calendar days of receipt of Ohio EPA comments. Schedules specified by the Ohio EPA will take precedence over the USACE schedule. Army approval is achieved through the COR, and Ohio EPA approval is achieved through receipt of EPA correspondence confirming the Plan approvals.

Task 3.0: Implementation of Work Plan

Within 30 days of Final WP approval, Contractor shall begin implementation of the WP by performing the field assessment activities specified in the approved plan. A revised schedule for implementation of field activities may be warranted due to weather conditions or other unforeseen changes in the project schedule. The USACE reserves the right to modify the schedule for field activities due to inclement weather, and for safety and health purposes.

The Contractor shall be responsible for and bear all associated costs necessary to achieve the objectives of the WP. This includes, but is not limited to, possible vegetation clearing activities, the geophysical delineation, and the soil sampling and analysis activities. Right of Entry to the Ravenna facility shall be coordinated with the OHARNG and the Army. Coordination with both agencies must first go through the Ravenna Facility Manager.

Task 3.1: Geophysical Delineation

The Contractor shall implement and complete a geophysical delineation of the buried or near surface materials (propellant can lids, etc.) in the designated Group 2 areas. The geophysical equipment must be appropriate and capable of identifying horizontal and vertical anomalies cause by buried waste. The proposed equipment and anticipated limitations shall be detailed in your proposal. The geophysical survey personnel shall be capable of producing working maps in the field or be capable of transmitting data back to the office and receiving a map back from the office prior to beginning work the next day.

The Contractor shall provide a cost of mobilization and demobilization, and a unit cost per day for the total geophysical survey cost including equipment, personnel, and daily map production support.

Task 3.2: Collecting Surface Soil Samples

Contractor shall collect Multi Increment® (MI) surface soil samples based on the results of the geophysical delineation. Up to three (3) (3 maximum plus QA samples) MI surface soil samples will be collected within those areas that are identified to include near surface propellant can lids or other possible waste materials.

The MI surface soil samples shall be obtained by collecting a minimum of 30 increments per sample area from 0 to 1 foot below ground surface (bgs). MI Sample areas should be approximately one quarter of an acre or less in size. Multiple smaller areas where anomalies are found can be combined into one designated MI sample area. Anomaly avoidance should be used during sampling to ensure soils around the anomalies can be collected to the desired depth of 1 foot bgs. The Contractor shall provide a unit price and total price for this task.

Task 3.3: Sample Analysis

Contractor shall provide fixed unit costs and total cost for analyses as specified in Table 1 included in this SOW. Costs shall include all labor, materials, equipment, and supplies necessary to complete this task. All samples shall be analyzed for TAL Metals, and common propellants used by the DoD including Nitrocellulose, Nitroglycerine, Nitroguanidine, and Perchlorate. One (1) of the samples shall also be analyzed for the RVAAP full suite as prescribed in the Facility Wide SAP. Contractor shall provide for quality control testing as specified in the facility wide SAP. QA samples will be collected at a frequency of 10% and sent to a lab contracted by the USACE. All analytical data should be reported per Ravenna specific ADR specifications. Analytical methods shall be in accordance with the Facility-Wide SAP and the Contractor's approved Work Plan.

IDW samples shall be analyzed for the Full List TCLP for waste characterization purposes. Upon project completion, the Government will de-obligate any unused funds associated with this Task.

Table 1 Costs for Soil Sample Analysis

Analyte	Fixed Unit Price	Number of Tests	Total Cost
Surface Soil			

MI Sample Prep			
TAL Metals			
Mercury			
Hexavalent Chromium			
Propellants			
Explosives			
SVOCs			
VOCs			
Pesticides			
PCBs			
TCLP			

Task 3.4: Disposal of IDW

Within 90 days of the generation of IDW, Contractor shall characterize and properly dispose of all IDW at approved off-site waste disposal facilities in compliance with all applicable Federal, State, and local rules, laws and regulations. Land application of select wastes may apply (subject to approval). Contractor is responsible for maintaining all applicable waste characterization and disposal records, and for producing a waste disposal report for submittal to and approval by the Ohio EPA. IDW disposal activities shall be coordinated with the RVAAP Facility Manager and the OHARNG. **(Note: All IDW is to be removed from the subject property no later than 90 days following waste generation.)**

Task 3.5: Data Management / Data Validation

EPA CLP Level IV data validation will be required to meet the requirements of the DoD QSM. The Contractor shall perform data verification for all analytical results according to the process provided in the Louisville QSM Supplement and QC criteria in the DoD QSM. USACE Louisville District shall contract a third-party contractor for a minimum 10% or greater validation of analytical results. The Contractor shall include the completed validation report as presented by the validator as an appendix to the final document, and discuss results in the project report. The report shall also be sent directly from the validator to the USACE technical contact upon completion of validation.

Task 3.6: Surveying and Mapping

Survey maps shall be provided in the report, which delineate the boundaries of the survey site, the boundaries and locations of the metal anomalies, and the soil sample locations subject to this SOW. All data submitted shall be in the Universal Transverse Mercator (UTM) coordinate system. *(Note: All coordinates shall be collected with applicable equipment capable of gauging field surveys within an accuracy of one meter or less of error.)*

Task 4.0: Investigation Report

The Contractor shall prepare and submit a Preliminary Draft investigation report within 90 calendar days following the completion of the field investigation activities. The report shall document the process and procedures used in conducting the geophysical delineation, and describe all soil sampling activities conducted during this project. This report shall include details about pre-mobilization, mobilization, site preparation, the geophysical delineation, sample collection, decontamination, analytical results, waste management, event chronology, final site inspection, and mapping. The investigation report maps shall include the delineation of known and/or suspected buried waste materials, and the locations of MI sample area boundaries.

Upon receipt of USACE comment responses, Contractor shall submit a Draft investigation report for stakeholder review and approval. The Contractor shall submit the Draft investigation report within 30 calendar days of receipt of COR comments on the draft document or in compliance with the schedule specified by the Ohio EPA. Schedules specified by the Ohio EPA will take precedence over the USACE schedule. Army approval is achieved through the COR.

4.2 CLIN No. 2 – Water Removal Services at Load Line 2

Task 1.0: Water Removal Services

As described in Section 1.2, former excavation activities conducted at Load Line 2 (RVAAP-09) have resulted in the accumulation of water within the building DB-802 footprint. Restoration activities are now planned at this location, and the accumulated water must be removed from the excavation to assist in the restoration activities.

The planned action for restoring this area is to push back concrete and other demolition debris into the excavation to a depth 4 feet below the surrounding grade. Then, soil will be placed on top of the rubble to match the surrounding grade. To achieve this, it is anticipated the water will need to be pumped out of the excavation in two phases. First, the Contractor shall pump water out of the excavation down to a level suitable to fill the excavation with demolition debris without causing the remaining water in the excavation to rise out of the excavation and cause excessive runoff. Once this amount of water is removed, the rubble will be immediately pushed into the excavation. Pushing rubble into the excavation will be completed under a previously awarded BRAC-D contract. After this work is complete, the Contractor shall revisit the site and pump out any water that is above the level of the demolition debris in the excavation. Once this water level is achieved, soil will be immediately placed into the excavation under a previously awarded BRAC-D contract. The Contractor must complete their work in accordance with the BRAC-D contractor's schedule. Pumping water out of the excavation must be done immediately before backfilling the excavation. Allowing time to pass between pumping water out of the excavation and backfilling may allow the excavation to again fill with water. Water should be removed from the excavation in a manner that is approved by the Army and the Ohio EPA. A Letter Work Plan shall be prepared presenting the methodology to conduct the water removal for concurrent review by all RVAAP stakeholders.

5.0 PAY ESTIMATES

The Contractor shall submit Pay Estimates using ENG Form 93 as specified in the contract. ENG Form 93 may be found on the Internet under the library of USACE publications. The Contractor shall ensure that the Pay Estimates include a separate line item for each task. All ENG Form 93 shall be submitted to the USACE COR or the COR designated representative. Electronic submission of Pay Estimates to the USACE is acceptable; however, should be followed with the mailing of a hard copy.

Release of Claims shall accompany the final Pay Estimate. The Release of Claims shall be signed and shall include the total contract amount, amount of final payment due, and a statement similar to the following:

> "The undersigned architect-engineer firm, under Contract No. ##, Delivery Order No. ##, between the United States of America and said Contractor for services at (property name) in (location) hereby release the U.S., its officers, agents, and employees from any and all claims arising under or by virtue of said contract or any modification or change thereof except with respect to those claims, if any, listed below:"

The Contractor's pay estimates must meet the CLIN structure presented in this SOW. For instance, all pay estimates for tasks performed under the environmental investigation for CC-RVAAP-80 shall appear under the CLIN No. 1 heading. All pay estimates associated with the water removal services at Load Line 2 shall appear under the CLIN No. 2 heading. Pay estimates submitted to the USACE without the proper CLIN designation shall be returned to the Contractor for clarification purposes.

6.0 PROPOSAL ESTIMATE

The Contractor shall submit a detailed estimate of the effort required to complete the described SOW. The proposal submittal shall also include the estimated costs associated with all planned sampling and analysis activities (other direct and indirect costs). The proposed sampling shall include 15% of the samples also having analyses for propellants, VOCs, SVOCs, pesticides/herbicides, and PCBs (full analyses), as prescribed in the Facility Wide SAP. The Contractor shall complete and submit Table 1 (as shown) as a summary of estimated costs.

Table 2: Contractor's Summary of Estimated Costs

Task #	Task Description	Unit	Fixed Unit Cost	Number of Units	Total Cost
CLIN No. 1 – Environmental Investigation at Compliance Restoration Site CC-RVAAP-80					
1.1	Project Management Plan				
1.2	Site Safety Health Plan				
1.3.1	Project Kickoff Meeting				

1.3.2	Monthly Progress Reports				
1.3.3	Records of Conversations				
1.3.4	Teleconference Progress Updates				
1.3.5	Meeting Minutes Documentation				
1.3.6	RAB Meetings				
2.0	Work Plan and Support Documents				
3.0	Implementation of Work Plan				
3.1	Geophysical Delineation				
3.2	Surface Soil Sampling				
3.3	Sample Analysis				
3.4	Disposal of IDW				
3.5	Data Management / Data Validation				
3.6	Surveying and Mapping				
4.0	Investigation Report				
				CLIN No. 1 – Total Cost Estimate	
CLIN No. 2 – Water Removal Services at Load Line 2					
1.0	Water Removal Services				
				CLIN No. 2 – Total Cost Estimate	

7.0 PERIOD OF PERFORMANCE / PROJECT SCHEDULE

The Period of Performance for this contract shall begin at the time of contract award, and ends 31 December 2011.

The Contractor shall submit a proposed project schedule for the described SOW. The schedule should be prepared in general conformance with the following schedule anticipated by the

USACE. *(Note: The award of this SOW to the Contractor is subject to the availability of funding.)*

Task No.	Identified Task	Duration / Due Date
CLIN No. 1 – Environmental Investigation at Compliance Restoration Site CC-RVAAP-80		
--	Preliminary Site Visit (Prior to Award)	14 Days of USACE Submittal of Request For Proposal (RFP)
--	Notice to Proceed (NTP) / Contract Award	31 March 2010
1.1	Pre-Draft Project Management Plan	30 Calendar Days of NTP
1.2	Pre-Draft Site Safety Health Plan	30 Calendar Days of NTP
1.3.1	Project Kickoff Meeting	30 Calendar Days of Approval of PMP and SSHP
1.3.2	Monthly Progress Reports	By the 5th Day of Each Month
1.3.3	Records of Conversations	By the 5th Day of Each Month
1.3.4	Teleconference Progress Updates	Bi-Weekly
1.3.5	Meeting Minutes Documentation	7 Calendar Days Following Meeting
1.3.6	RAB Meetings	Once per Army Direction
2.0	Pre-Draft Work Plan and Support Documents	60 Calendar Days of NTP
3.0	Implementation of Work Plan	Begin 30 Calendar Days of Approval of Final Work Plan
4.0	Pre-Draft Investigation Report	Within 90 Calendar Days of Completing Field Investigation Activities
CLIN No. 2 – Water Removal Services at Load Line 2		
1.0	Water Removal Services	Must adhere to BRAC-D Contractor's Schedule

Upon project award to the Contractor, the agreed upon project schedule will be updated with calendar dates and will be included in the Contractor's PMP. Adherence to the PMP project schedule will serve as a measurement of Contractor performance on this project.

8.0 ADDITIONAL INFORMATION

8.1 Additional Contractor Requirements

The Contractor shall be aware of the following requirements:

- HTRW, MEC, MC or MD may be found in munitions, containers, landfills, Open Burning/Open Detonation (OB/OD) areas, ground spills, surface water, or groundwater. If suspected HTRW, MEC, MC or MD of unknown origin and nature is encountered, the

contractor shall immediately notify the Facility Manager, the Contracting Officer or the designated COR. The contractor shall take necessary actions to protect the safety of its workforce, the public, and the environment.

- Permits. The contractor shall obtain the permits and licenses necessary to conduct his/her operations including, but not necessarily limited to, installation required permits, building permits, drilling permits, and/or waste transportation and disposal permits.

- 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 Accident Prevention Plan (APP) for the site. A Site Safety and Health Plan (SSHP) shall be included in the APP as an Attachment. 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.

- 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.

Appendix B

Figures

Figure 1 – General Location and Orientation of RVAAP

Figure 2 – Compliance Restoration Site CC-RVAAP-08, Group 2 Propellant Can Tops and RVAAP-09 Load Line 2 Building DB-802 within RVAAP

Figure 3 - CC-RVAAP-08, Group 2 Propellant Can Tops Site Map

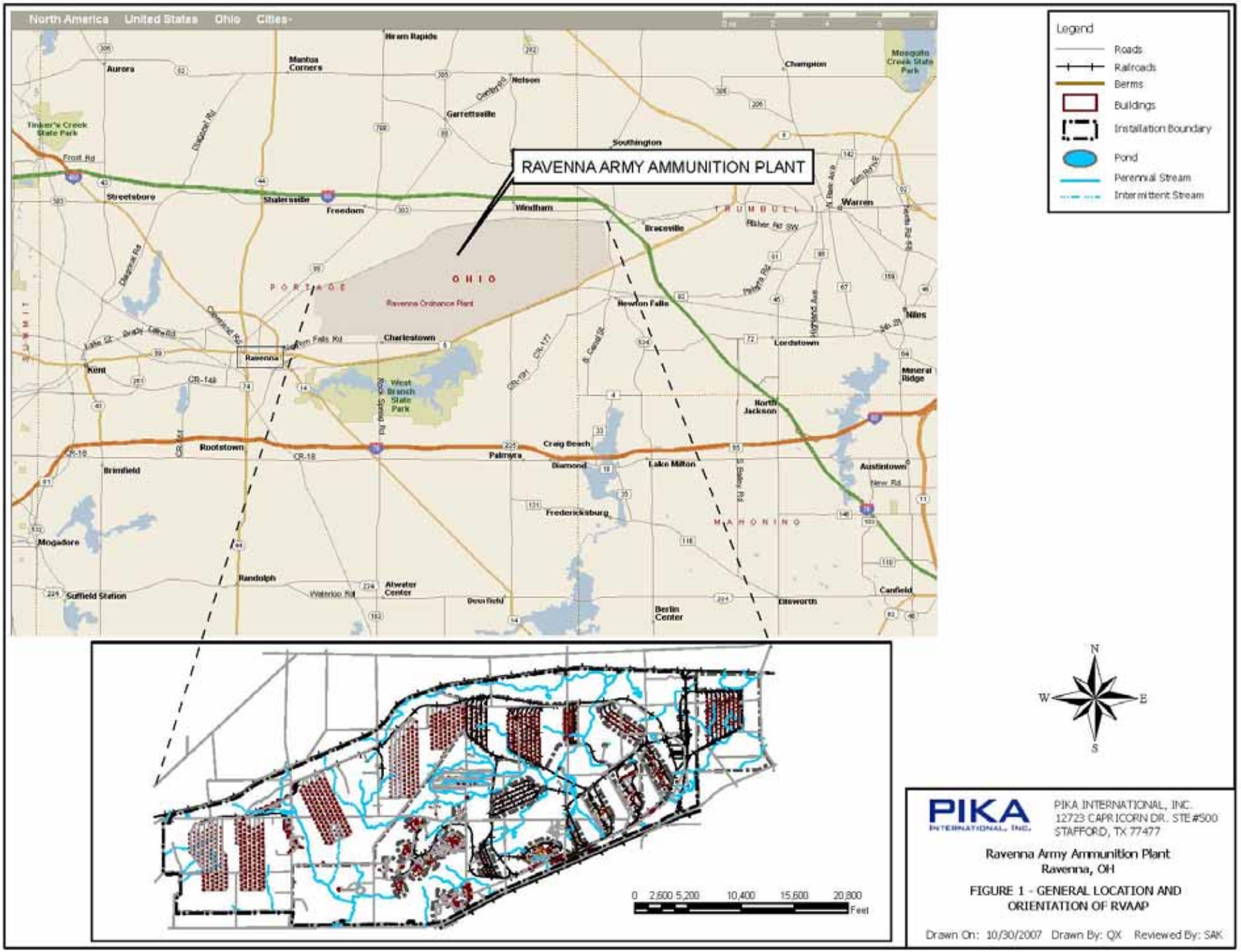
Figure 4 - Load Line 2 Building DB-802 Site Map

Figure 5 – Group 2 Sample Boundaries Area

Figure 6 – Group 2 Anomaly Cluster Areas

Figure 7 – Group 2 Sample Locations

Figure 8 – Group 2 Sample Boundaries



PIKA INTERNATIONAL, INC.
12723 CAPRICORN 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

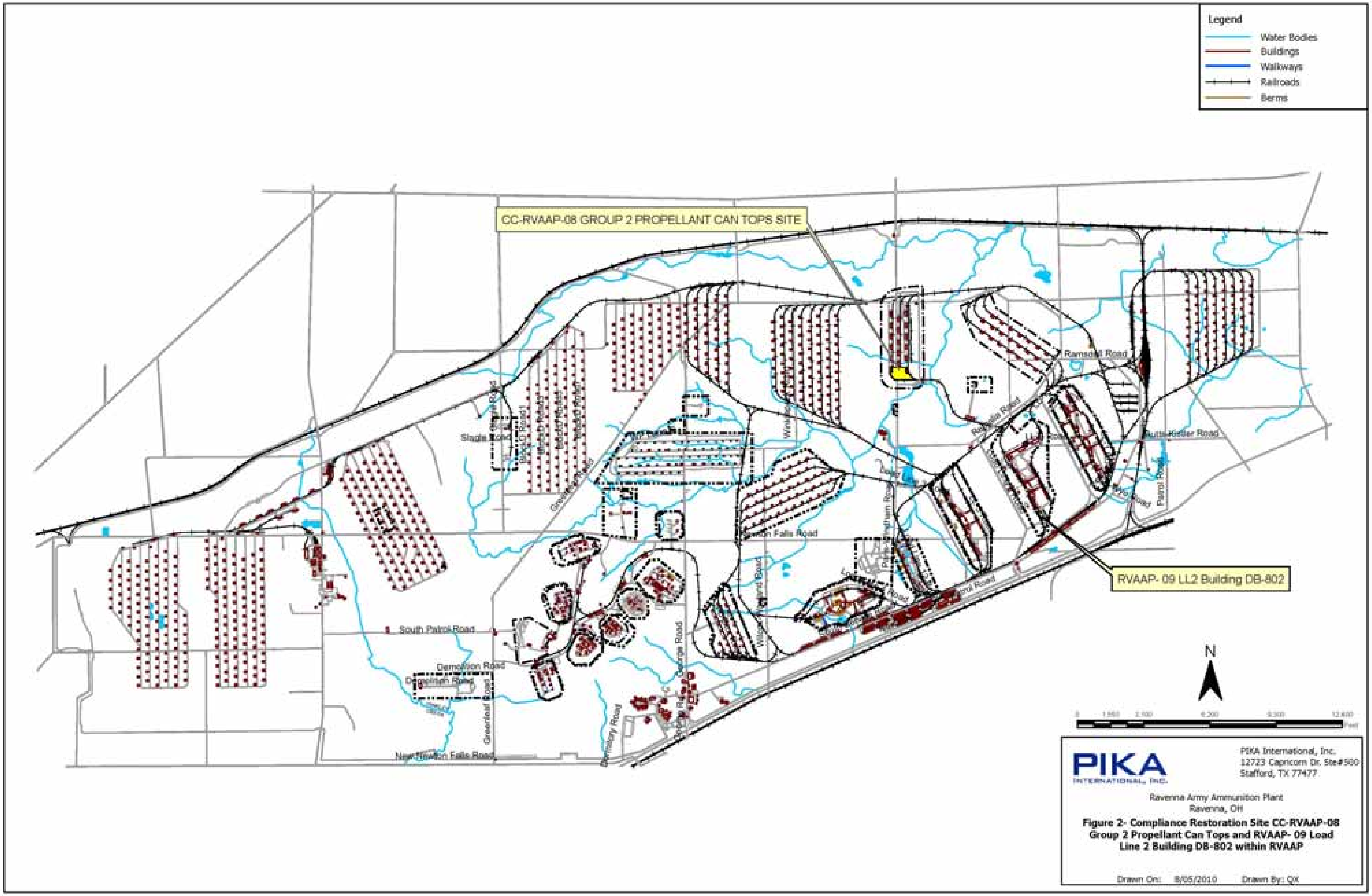
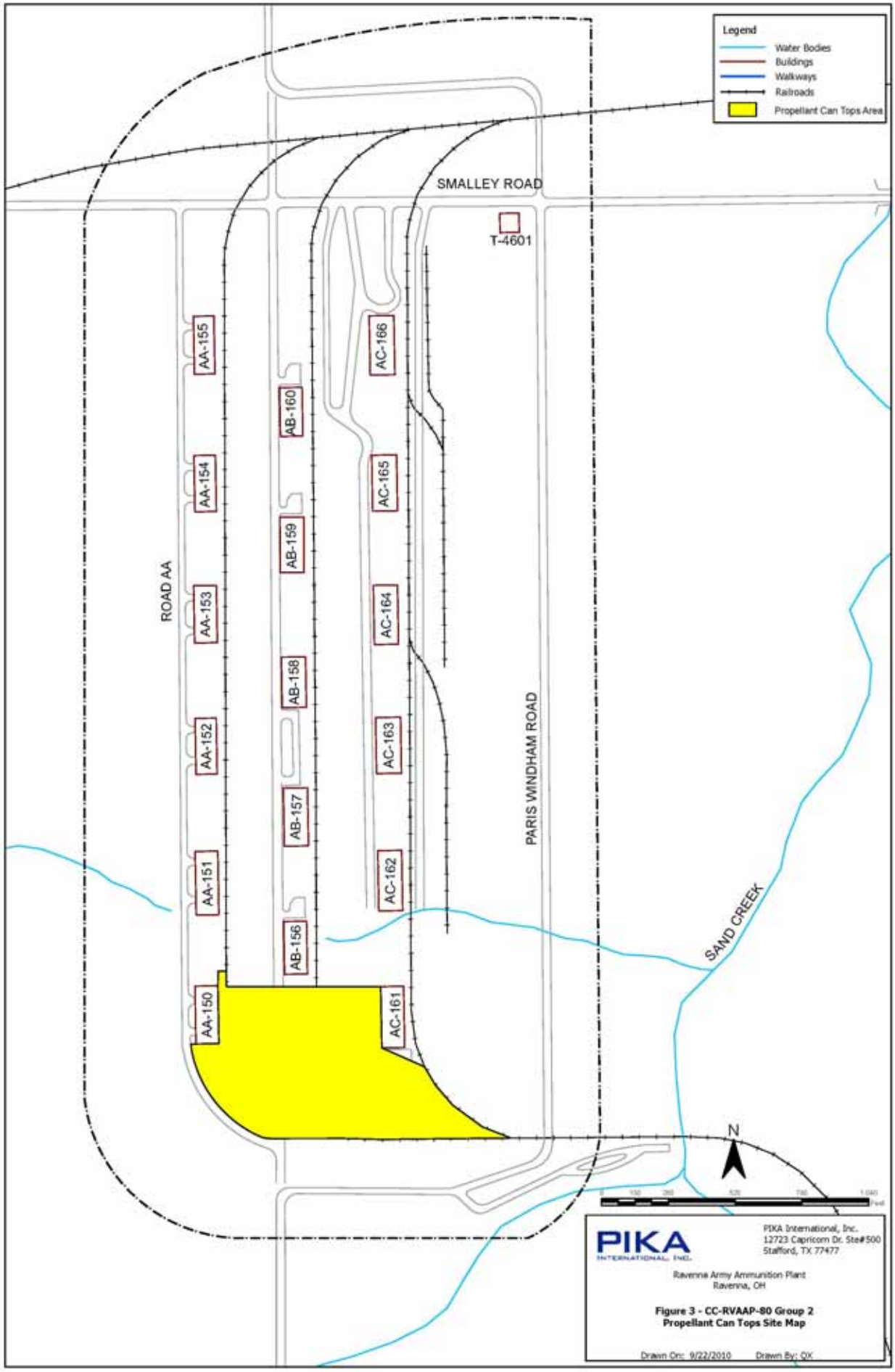
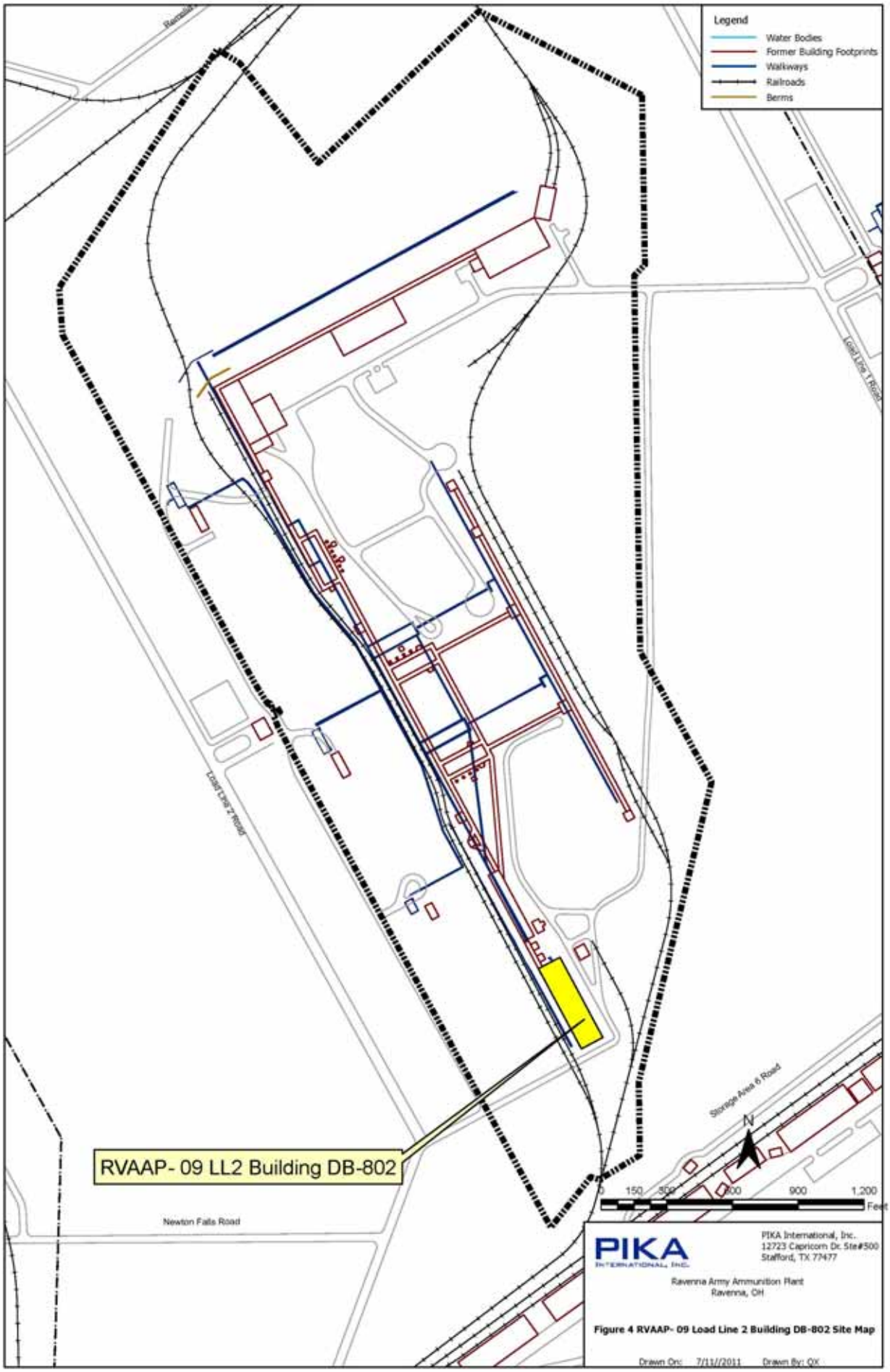


Figure 2- Compliance Restoration Site CC-RVAAP-08 Group 2 Propellant Can Tops and RVAAP- 09 Load Line 2 Building DB-802 within RVAAP


Legend
Water Bodies
Buildings
Walkways
Railroads
Propellant Can Tops Area
SMALLEY ROAD
T-4601
ROAD AA
PARIS WINDHAM ROAD
SAND CREEK
AA-150
AA-151
AA-152
AA-153
AA-154
AA-155
AB-156
AB-157
AB-158
AB-159
AB-160
AC-161
AC-162
AC-163
AC-164
AC-165
AC-166
N
PIKA
PIKA International, Inc.
12723 Capricorn Dr. Ste#500
Stafford, TX 77477
Ravenna Army Ammunition Plant
Ravenna, OH
Figure 3 - CC-RVAAP-80 Group 2
Propellant Can Tops Site Map
Drawn On: 9/22/2010
Drawn By: QK


Legend
Water Bodies
Former Building Footprints
Walkways
Railroads
Berms
Load Line 1 Road
Load Line 2 Road
Storage Area 6 Road
RVAAP- 09 LL2 Building DB-802
Newton Falls Road
N
0 150 300 600 900 1,200
Feet
PIKA
PIKA International, Inc.
12723 Capricorn Dr. Ste#500
Stafford, TX 77477
Ravenna Army Ammunition Plant
Ravenna, OH
Figure 4 RVAAP- 09 Load Line 2 Building DB-802 Site Map
Drawn On: 7/11/2011 Drawn By: QX

PIKA
INTERNATIONAL, INC.

Figure 5 - Group 2 Wetland Locations

Wetland Category

150 75 0 150 Meters

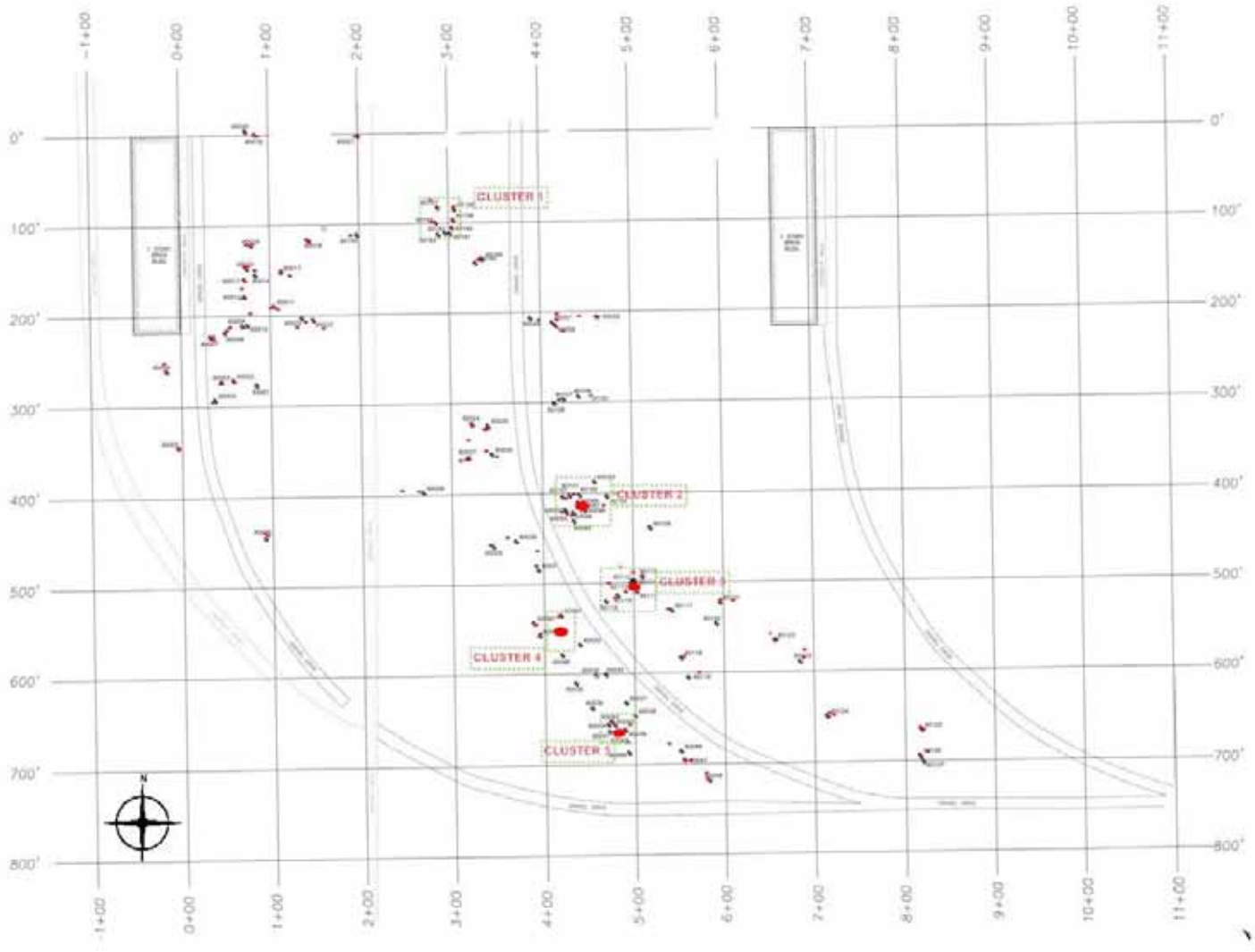
500 250 0 500 Feet

N

ES ENVIRO SCIENCE INCORPORATED

PIKA
INTERNATIONAL, INC.

FIGURE 6 - GROUP 2
ANOMALY CLUSTER AREAS



ANOMALY CLUSTER AREA

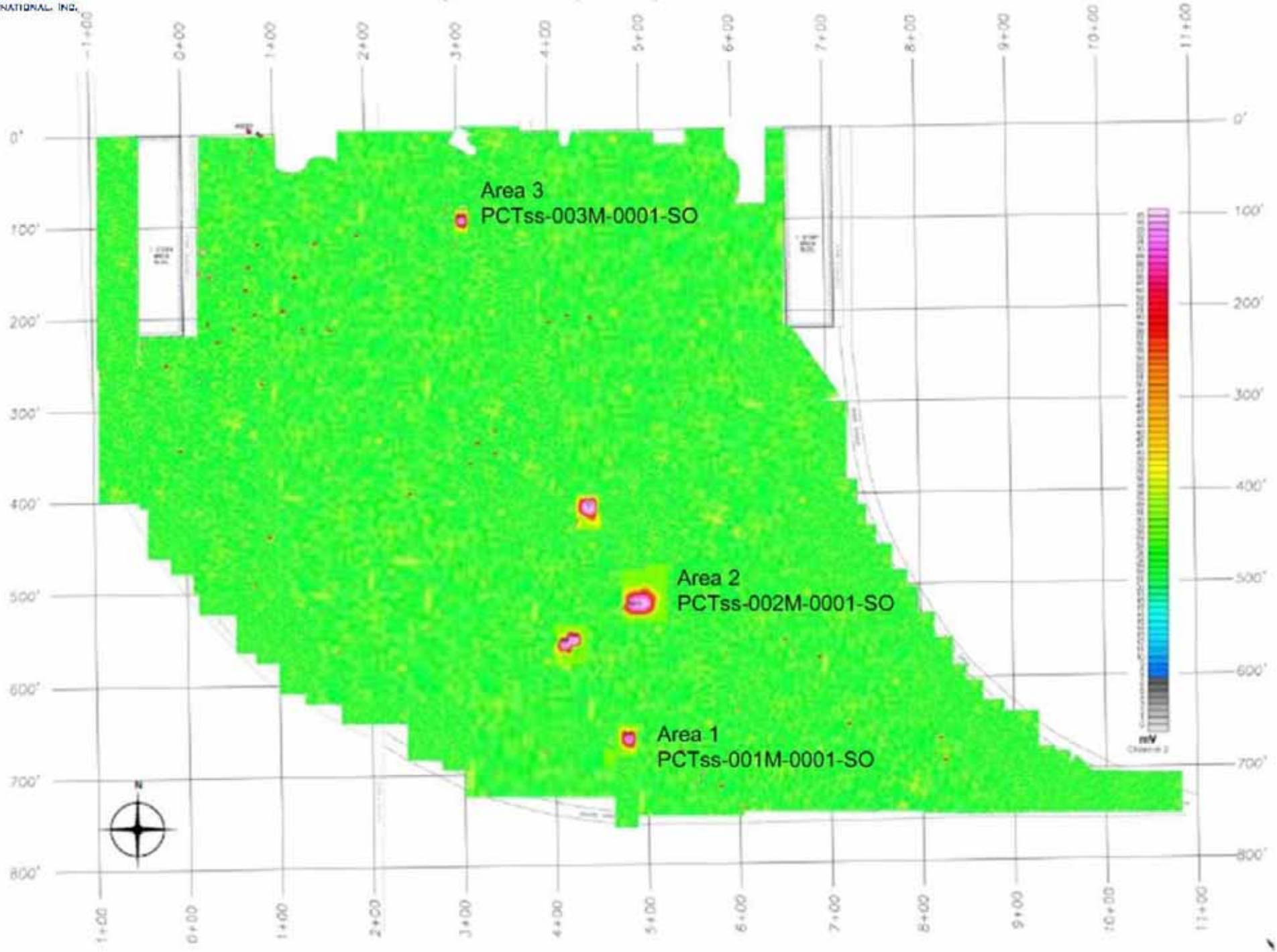
GEOSEARCHES

TEL: 440 893-0642
FAX: 440 893-4023

Project Designer:	
PIKA INTERNATIONAL	
Project Contact:	
GeoSearches, Inc.	
Project #	WO#
RVAAP	
Date:	Rev. Date:
05/20/11	

PIKA
INTERNATIONAL, INC.

Figure 7 - Group 2 Sample Locations



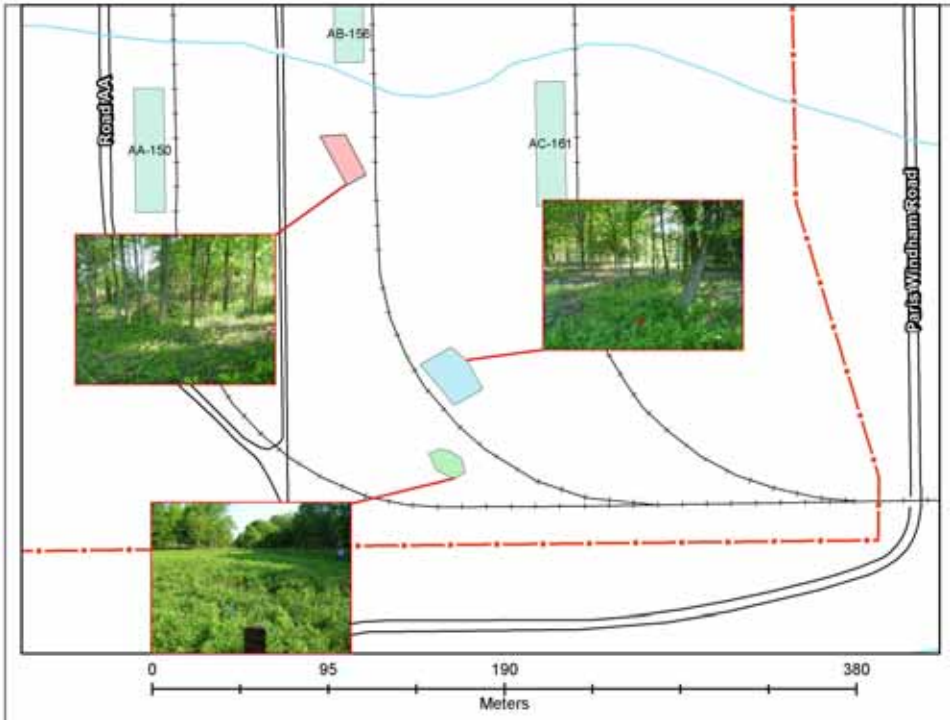
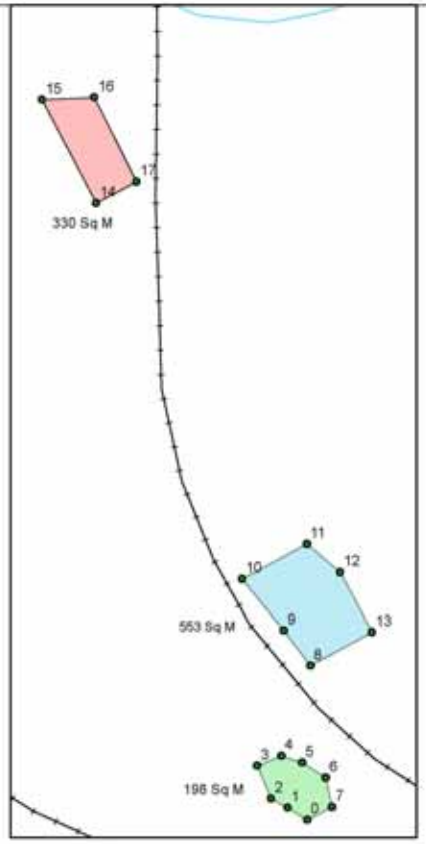


FIGURE 8 - GROUP 2 SAMPLE BOUNDARIES
PIKA INTERNATIONAL, INC.
GROUP 2 PROPELLANT CAN SITE INVESTIGATION

Ravenna Army Ammunition Plant Ravenna, Ohio

Prepared May 31, 2011 by:

VISTA SCIENCES CORPORATION
205 W. Boutz Rd. Bldg. 3 Suite C
Las Cruces, New Mexico 88005
575-526-9558



UTM Coordinates shown in meters
Zone 17N

FID	X	Y
0	495987	4562199
1	495982	4562202
2	495978	4562204
3	495974	4562213
4	495981	4562215
5	495986	4562213
6	495992	4562209
7	495994	4562202
8	495988	4562238
9	495981	4562247
10	495971	4562261
11	495987	4562270
12	495996	4562262
13	496004	4562247
14	495933	4562318
15	495919	4562385
16	495932	4562385
17	495943	4562364

Legend

- Multi Increment Sample Boundaries Area 3
- Multi Increment Sample Boundaries Area 2
- Multi Increment Sample Boundaries Area 1
- Former Railroad Bed

0 40 80 160
Meters

Appendix-C

Weekly Reports and Photo Documentation

WEEKLY REPORT

Prime Contracts No:	W912QR-10-P-0058		**Report No.**	1
PIKA Projects #:	10-08-130		**Date:**	4-04-11 to 4-08-11
Project:	RVAAP Compliance Rest. Site-CC-RVAAP-80 & Other Environmental Services, Ravenna Army Ammunition Plant, Ravenna, Ohio			

Summary of Activities:

- Initiated surface sweep operation to ensure the site is free of surface MEC/UXO prior to initiating the brush clearing and geophysical survey operations. Approximately 1/3 of the site is complete.
- No MEC or MD items encountered during the surface sweep operations to date.

Others:

- Conducted daily safety briefings.

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

Upon arrival to the site on Thursday, April 7, 2011 to initiate the surface sweep operations, it was noted that Ohio Army National Guard (OHARNG) training exercises were being conducted within the AOC along the western quarter of the site adjacent to building AA-150. Additionally, it was noted that seibert stakes had been installed along a portion of the perimeter of the AOC which did not match the extent of the AOC as depicted in the scope of work and approved work plan. PIKA visited the site the same day with Ohio EPA (Eileen Mohr) and VISTA Sciences representative Jim McGee for clarification/correction. In the afternoon of April 7, 2011 USACE – Louisville, Ohio EPA and RVAAP Facility Manager verified that the AOC boundaries were correct as depicted in the approved work plan.

Work Completed:

	This Week	Cumulative to-date
Surface clearance operations	35%	35%
Brush Clearing	-	0%
Geophysical Investigation	-	0%
Conducting MI Sampling	-	0%

Final Report Preparation	-	0%

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
None	None	None	Not Applicable

Major Problems and Resolution: Discrepancy with the AOC boundary as previously noted.

Schedule for Next Week

- Complete surface sweep operation.
- Initiate brush clearing operation.

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

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

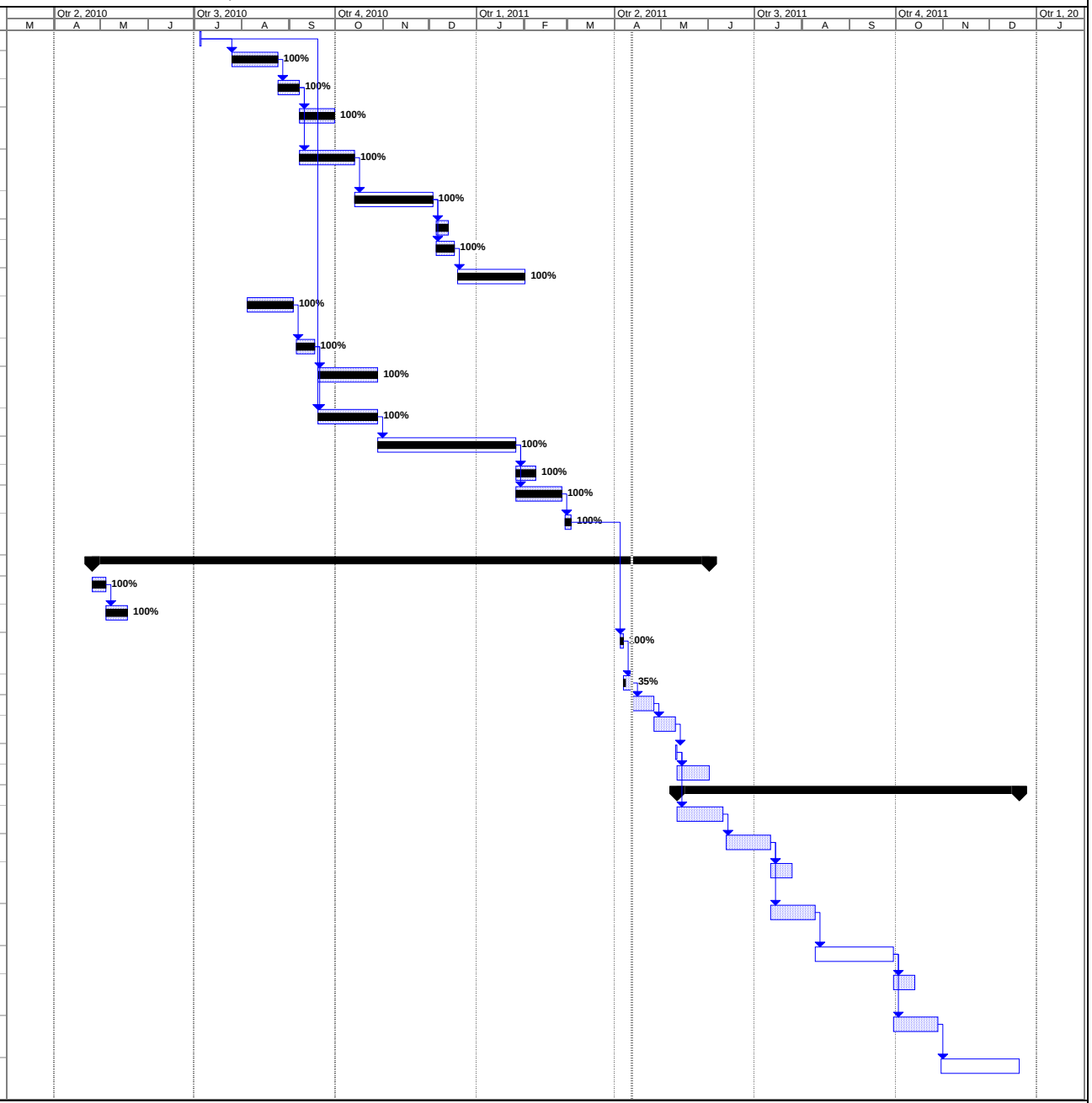
Photo Log

UXO technicians conducting surface sweep operations with Group 2 Propellant Can site.

Schedule

Project Schedule
Compliance restoration Site CC-RVAAP-80 and Other Environmental Services
Ravenna Army Ammunition Plant, Ravenna, Ohio

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Contract Award**	1 day	Mon 7/5/10	Mon 7/5/10	
2	Prepare Pre-draft PMP and SSHP	22 days	Mon 7/26/10	Tue 8/24/10	1
3	Army review Pre-Draft Work Plans	10 days	Wed 8/25/10	Tue 9/7/10	2
4	Pre-draft comment resolution for PMP and SSHP	17 days	Wed 9/8/10	Thu 9/30/10	3
5	Develop Draft PMP and SSHP and submit to OEPA/Stakeholders	26 days	Wed 9/8/10	Wed 10/13/10	3
6	Army/OEPA Review of Draft PMP and SSHP	37 days	Thu 10/14/10	Fri 12/3/10	5
7	Draft Comment Resolution	6 days	Mon 12/6/10	Mon 12/13/10	6
8	Develp Final PMP and SSHP Work Plans	10 days	Mon 12/6/10	Fri 12/17/10	6
9	Army/OEPA Review of Final PMP and SSHP Plans	32 days	Mon 12/20/10	Tue 2/1/11	8
10	Prepare Pre Draft Work Plan, SAP and QAAP	22 days	Thu 8/5/10	Fri 9/3/10	
11	Army review of Pre Draft Work Plan, SAP and QAPP	10 days	Mon 9/6/10	Fri 9/17/10	10
12	Pre-draft comment resolution for Work Plan, SAP and QAAP	29 days	Mon 9/20/10	Thu 10/28/10	11
13	Develop Draft WP, SAP and QAPP	29 days	Mon 9/20/10	Thu 10/28/10	11,1
14	Army/OEPA review of Draft WP, SAP and QAPP	64 days	Fri 10/29/10	Wed 1/26/11	13
15	Draft Comment Resolution	9 days	Thu 1/27/11	Tue 2/8/11	14
16	Develop Final WP, SAP and QAPP	22 days	Thu 1/27/11	Fri 2/25/11	14
17	Army/OEPA Review of Final WP, SAP and QAPP	4 days	Mon 2/28/11	Thu 3/3/11	16
18	**Begin Field Work**	**288 days**	**Mon 4/26/10**	**Wed 6/1/11**	
19	Submit Water Removal Letter work plan for	7 days	Mon 4/26/10	Tue 5/4/10	
20	Conduct Water removal At LL2 bldg 802	10 days	Wed 5/5/10	Tue 5/18/10	19
21	Mobilization for Geophysical Study at Group 2	2 days	Tue 4/5/11	Wed 4/6/11	17
22	Surface Sweep	4 days	Thu 4/7/11	Tue 4/12/11	21
23	Brush Clearing	10 days	Wed 4/13/11	Tue 4/26/11	22
24	Geophysical investigation at Group 2	10 days	Wed 4/27/11	Tue 5/10/11	23
25	Soil Sampling	1 day	Wed 5/11/11	Wed 5/11/11	24
26	Disposal of IDW	15 days	Thu 5/12/11	Wed 6/1/11	25
27	**Investigation Report**	**159 days**	**Thu 5/12/11**	**Tue 12/20/11**	
28	Prepare and submit Pre-Draft Investigation	22 days	Thu 5/12/11	Fri 6/10/11	25
29	USACE Review of Pre-draft Report	21 days	Mon 6/13/11	Mon 7/11/11	28
30	Respond to USACE Comments on Pre-draft Report	10 days	Tue 7/12/11	Mon 7/25/11	29
31	Prepare and submit Draft Report for OEPA/Stakeholder review	21 days	Tue 7/12/11	Tue 8/9/11	29
32	Review Draft by OEPA/Stakeholders	37 days	Wed 8/10/11	Thu 9/29/11	31
33	Respond to OEPA/Stakeholder Comments on Pre-draft Report	10 days	Fri 9/30/11	Thu 10/13/11	32
34	Revise doc and Submit Final Iteration	21 days	Fri 9/30/11	Fri 10/28/11	32
35	Review Final Iteration by OEPA	37 days	Mon 10/31/11	Tue 12/20/11	34



Project: Group 2 schedule
Date: Tue 4/12/11

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

WEEKLY REPORT

Prime Contracts No:	W912QR-10-P-0058		**Report No.**	2
PIKA Projects #:	10-08-130		**Date:**	4-11-11 to 4-15-11
Project:	RVAAP Compliance Rest. Site-CC-RVAAP-80 & Other Environmental Services, Ravenna Army Ammunition Plant, Ravenna, Ohio			

Summary of Activities:

- Completed surface sweep operation to ensure the site is free of surface MEC/UXO prior to initiating the brush clearing and geophysical survey operations.
- No MEC or MD items encountered during the surface sweep operations.

Others:

- Conducted daily safety briefings.

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

Due to extensive training by OHARNG within Group 2 through 22 April 2011, the brush clearing operations will be delayed until the week of 25 April 2011.

Work Completed:

	This Week	Cumulative to-date
Surface clearance operations	65%	100%
Brush Clearing	-	0%
Geophysical Investigation	-	0%
Conducting MI Sampling	-	0%
Final Report Preparation	-	0%

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
None	None	None	Not Applicable

Major Problems and Resolution: The delay to the brush clearing operation pushes the final completion date for the project right up to the end date for project period of performance. PIKA notified CELRL for a contract extension at no cost to the government to ensure no issues.

Schedule for Next Week

- Survey and mark wetland locations within AOC to facilitate brush clearing operations during week of 25 April 2011.

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

UXO technicians conducting surface sweep operations with Group 2 Propellant Can site.

Schedule

Project Schedule
Compliance restoration Site CC-RVAAP-80 and Other Environmental Services
Ravenna Army Ammunition Plant, Ravenna, Ohio

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4	Pre-draft comment resolution for PMP and SSHP	17 days	Wed 9/8/10	Thu 9/30/10	3
5	Develop Draft PMP and SSHP and submit to OEPA/Stakeholders	26 days	Wed 9/8/10	Wed 10/13/10	3
6	Army/OEPA Review of Draft PMP and SSHP	37 days	Thu 10/14/10	Fri 12/3/10	5
7	Draft Comment Resolution	6 days	Mon 12/6/10	Mon 12/13/10	6
8	Develp Final PMP and SSHP Work Plans	10 days	Mon 12/6/10	Fri 12/17/10	6
9	Army/OEPA Review of Final PMP and SSHP Plans	32 days	Mon 12/20/10	Tue 2/1/11	8
10	Prepare Pre Draft Work Plan, SAP and QAAP	22 days	Thu 8/5/10	Fri 9/3/10	
11	Army review of Pre Draft Work Plan, SAP and QAPP	10 days	Mon 9/6/10	Fri 9/17/10	10
12	Pre-draft comment resolution for Work Plan, SAP and QAAP	29 days	Mon 9/20/10	Thu 10/28/10	11
13	Develop Draft WP, SAP and QAPP	29 days	Mon 9/20/10	Thu 10/28/10	11,1
14	Army/OEPA review of Draft WP, SAP and QAPP	64 days	Fri 10/29/10	Wed 1/26/11	13
15	Draft Comment Resolution	9 days	Thu 1/27/11	Tue 2/8/11	14
16	Develop Final WP, SAP and QAPP	22 days	Thu 1/27/11	Fri 2/25/11	14
17	Army/OEPA Review of Final WP, SAP and QAPP	4 days	Mon 2/28/11	Thu 3/3/11	16
18	**Begin Field Work**	**296 days**	**Mon 4/26/10**	**Mon 6/13/11**	
19	Submit Water Removal Letter work plan for	7 days	Mon 4/26/10	Tue 5/4/10	
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21	Mobilization for Geophysical Study at Group 2	2 days	Tue 4/5/11	Wed 4/6/11	17
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23	Brush Clearing	10 days	Mon 4/25/11	Fri 5/6/11	22
24	Geophysical investigation at Group 2	10 days	Mon 5/9/11	Fri 5/20/11	23
25	Soil Sampling	1 day	Mon 5/23/11	Mon 5/23/11	24
26	Disposal of IDW	15 days	Tue 5/24/11	Mon 6/13/11	25
27	**Investigation Report**	**159 days**	**Tue 5/24/11**	**Fri 12/30/11**	
28	Prepare and submit Pre-Draft Investigation	22 days	Tue 5/24/11	Wed 6/22/11	25
29	USACE Review of Pre-draft Report	21 days	Thu 6/23/11	Thu 7/21/11	28
30	Respond to USACE Comments on Pre-draft Report	10 days	Fri 7/22/11	Thu 8/4/11	29
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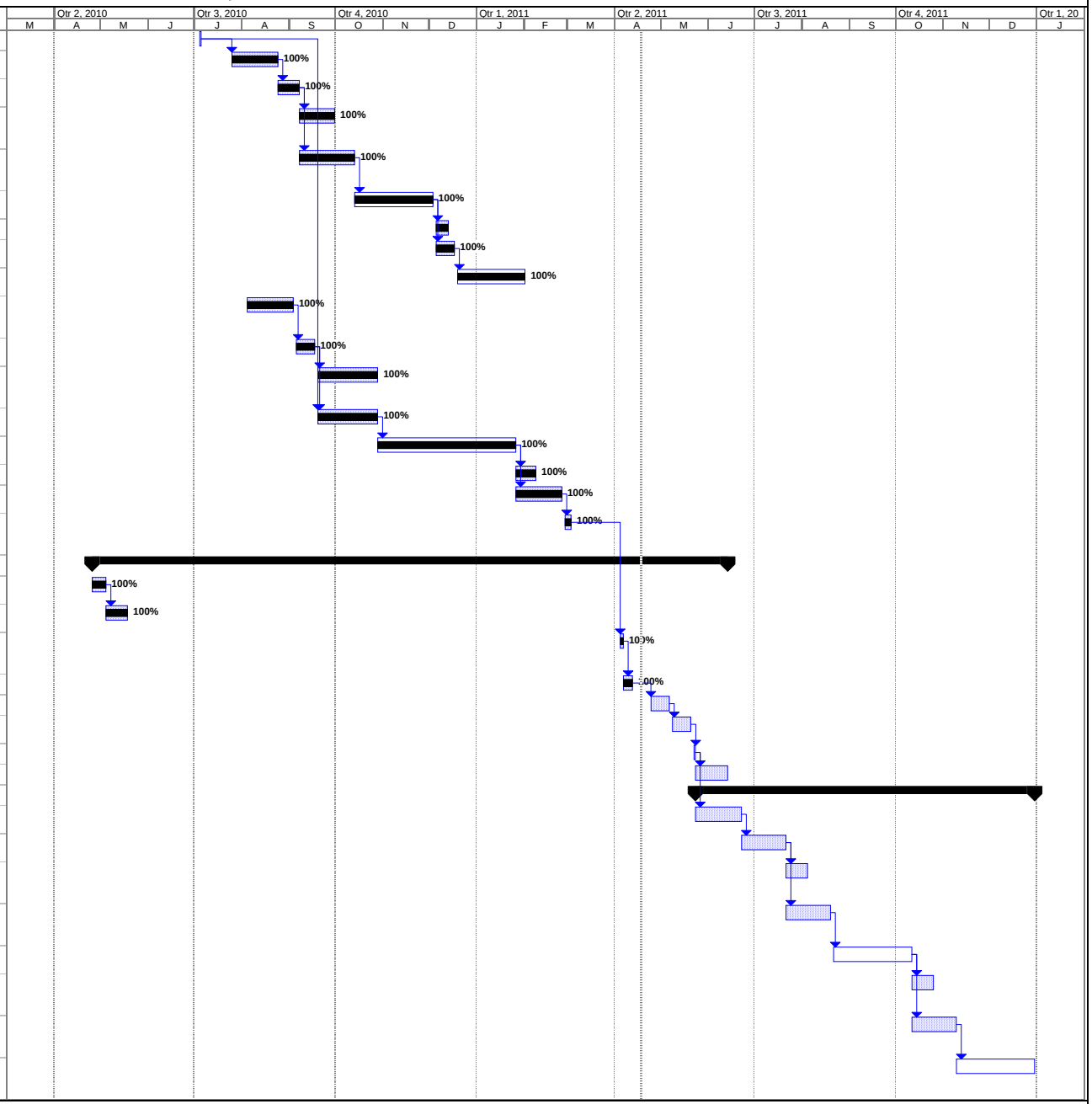
32	Review Draft by OEPA/Stakeholders	37 days	Mon 8/22/11	Tue 10/11/11	31
33	Respond to OEPA/Stakeholder Comments on Pre-draft Report	10 days	Wed 10/12/11	Tue 10/25/11	32
34	Revise doc and Submit Final Iteration	21 days	Wed 10/12/11	Wed 11/9/11	32
35	Review Final Iteration by OEPA	37 days	Thu 11/10/11	Fri 12/30/11	34



Project: Group 2 schedule
Date: Mon 4/18/11

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

WEEKLY REPORT

Prime Contracts No:	W912QR-10-P-0058		**Report No.**	3
PIKA Projects #:	10-08-130		**Date:**	4-18-11 to 4-22-11
Project:	RVAAP Compliance Rest. Site-CC-RVAAP-80 & Other Environmental Services, Ravenna Army Ammunition Plant, Ravenna, Ohio			

Summary of Activities:

- Located and marked existing wetlands within AOC using data from Ohio Army National Guard wetland surveys. Wetlands marked to ensure no disturbance during site operations.

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
Surface clearance operations	-	100%
Brush Clearing	-	0%
Geophysical Investigation	-	0%
Conducting MI Sampling	-	0%
Final Report Preparation	-	0%

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
None	None	None	Not Applicable

Major Problems and Resolution: None.

Schedule for Next Week

- Initiate brush clearing operations.

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

Pictures showing Surveyor (with UXO support) locating and marking the wetland locations within AOC.

Schedule

Project Schedule
Compliance restoration Site CC-RVAAP-80 and Other Environmental Services
Ravenna Army Ammunition Plant, Ravenna, Ohio

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Contract Award**	1 day	Mon 7/5/10	Mon 7/5/10	
2	Prepare Pre-draft PMP and SSHP	22 days	Mon 7/26/10	Tue 8/24/10	1
3	Army review Pre-Draft Work Plans	10 days	Wed 8/25/10	Tue 9/7/10	2
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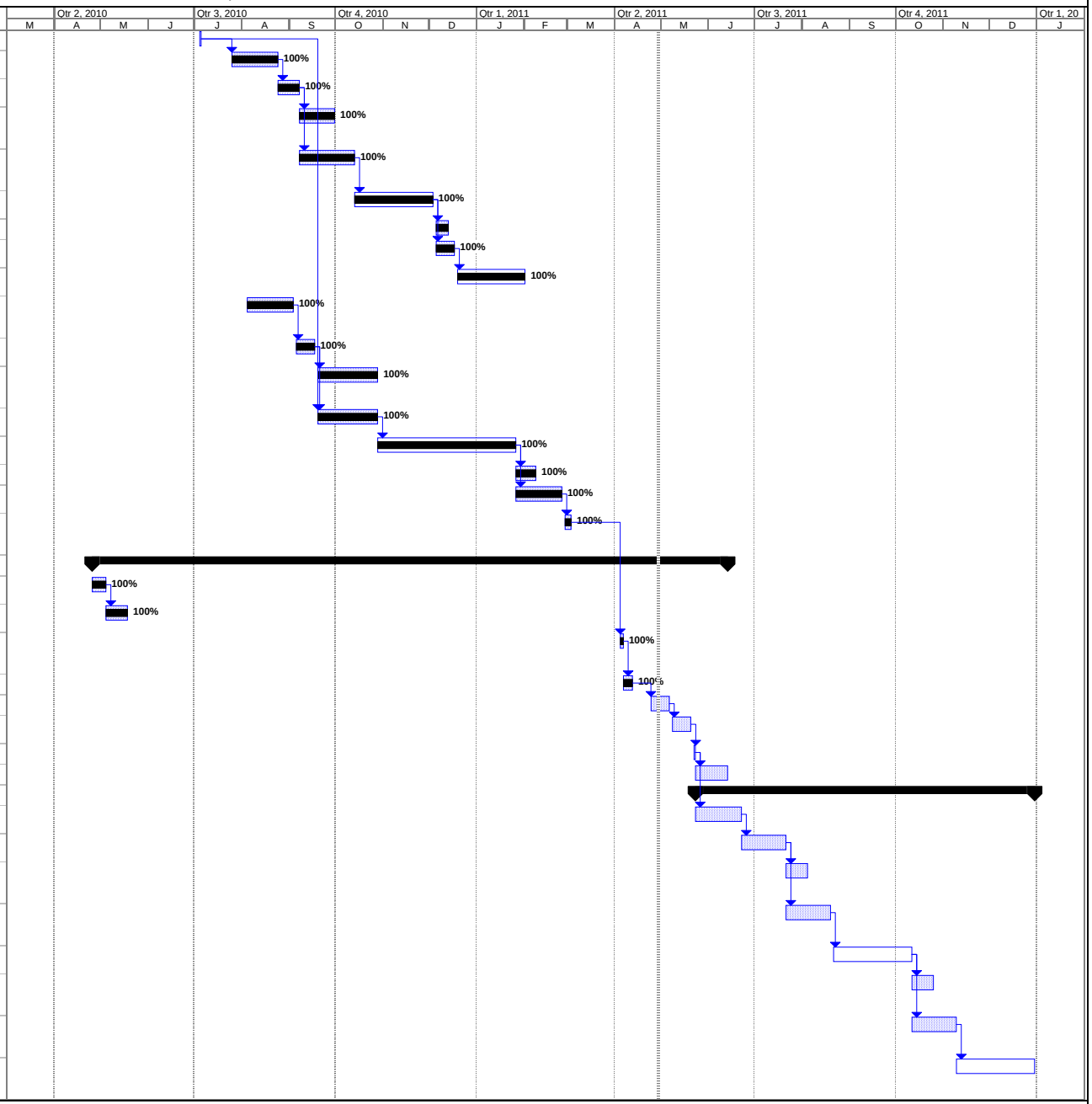

Project: Group 2 schedule
Date: Fri 4/29/11

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

WEEKLY REPORT

Prime Contracts No:	W912QR-10-P-0058		**Report No.**	4
PIKA Projects #:	10-08-130		**Date:**	4-25-11 to 4-29-11
Project:	RVAAP Compliance Rest. Site-CC-RVAAP-80 & Other Environmental Services, Ravenna Army Ammunition Plant, Ravenna, Ohio			

Summary of Activities:

- Initiated brush clearing operations.

Others:

- Conducted daily safety briefings.

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

Visitors: Eric Cheng – CELRL

Received no cost contract extension to April 2012.

Work Completed:

	This Week	Cumulative to-date
Surface clearance operations	-	100%
Brush Clearing	50	50%
Geophysical Investigation	-	0%
Conducting MI Sampling	-	0%
Final Report Preparation	-	0%

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
None	None	None	Not Applicable

Major Problems and Resolution: None

Schedule for Next Week

- Complete brush clearing operations.

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





Brush clearing operation at Group 2 propellant can site.

Schedule

Project Schedule
Compliance restoration Site CC-RVAAP-80 and Other Environmental Services
Ravenna Army Ammunition Plant, Ravenna, Ohio

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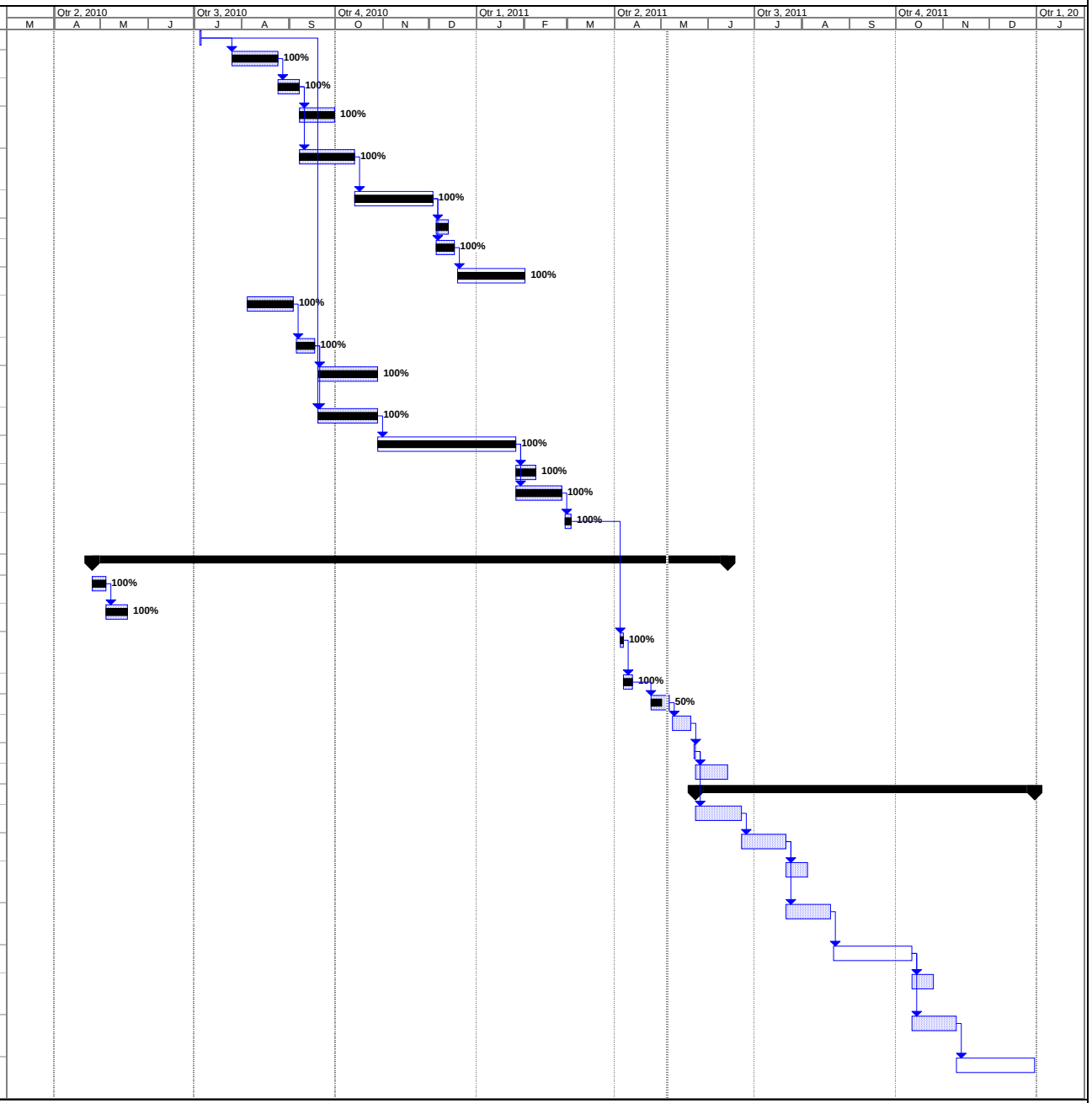

Project: Group 2 schedule
Date: Thu 5/5/11

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

WEEKLY REPORT

Prime Contracts No:	W912QR-10-P-0058		**Report No.**	5
PIKA Projects #:	10-08-130		**Date:**	5-2-11 to 5-6-11
Project:	RVAAP Compliance Rest. Site-CC-RVAAP-80 & Other Environmental Services, Ravenna Army Ammunition Plant, Ravenna, Ohio			

Summary of Activities:

- Completed brush clearing operations.

Others:

- Conducted daily safety briefings.

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

Site Visitor – Terence Hamill – GeoSearches Project Geophysicist. Conducted site visit to view site conditions during brush clearing operations. No issues or problems.

Work Completed:

	This Week	Cumulative to-date
Surface clearance operations	-	100%
Brush Clearing	50	100%
Geophysical Investigation	-	0%
Conducting MI Sampling	-	0%
Final Report Preparation	-	0%

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
None	None	None	Not Applicable

Major Problems and Resolution: None.

Schedule for Next Week

- Initiate geophysical investigation.

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

Brush clearing operation at Group 2 site.

Views of Group 2 site following brush clearing operation.

Schedule

Project Schedule
Compliance restoration Site CC-RVAAP-80 and Other Environmental Services
Ravenna Army Ammunition Plant, Ravenna, Ohio

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Contract Award**	1 day	Mon 7/5/10	Mon 7/5/10	
2	Prepare Pre-draft PMP and SSHP	22 days	Mon 7/26/10	Tue 8/24/10	1
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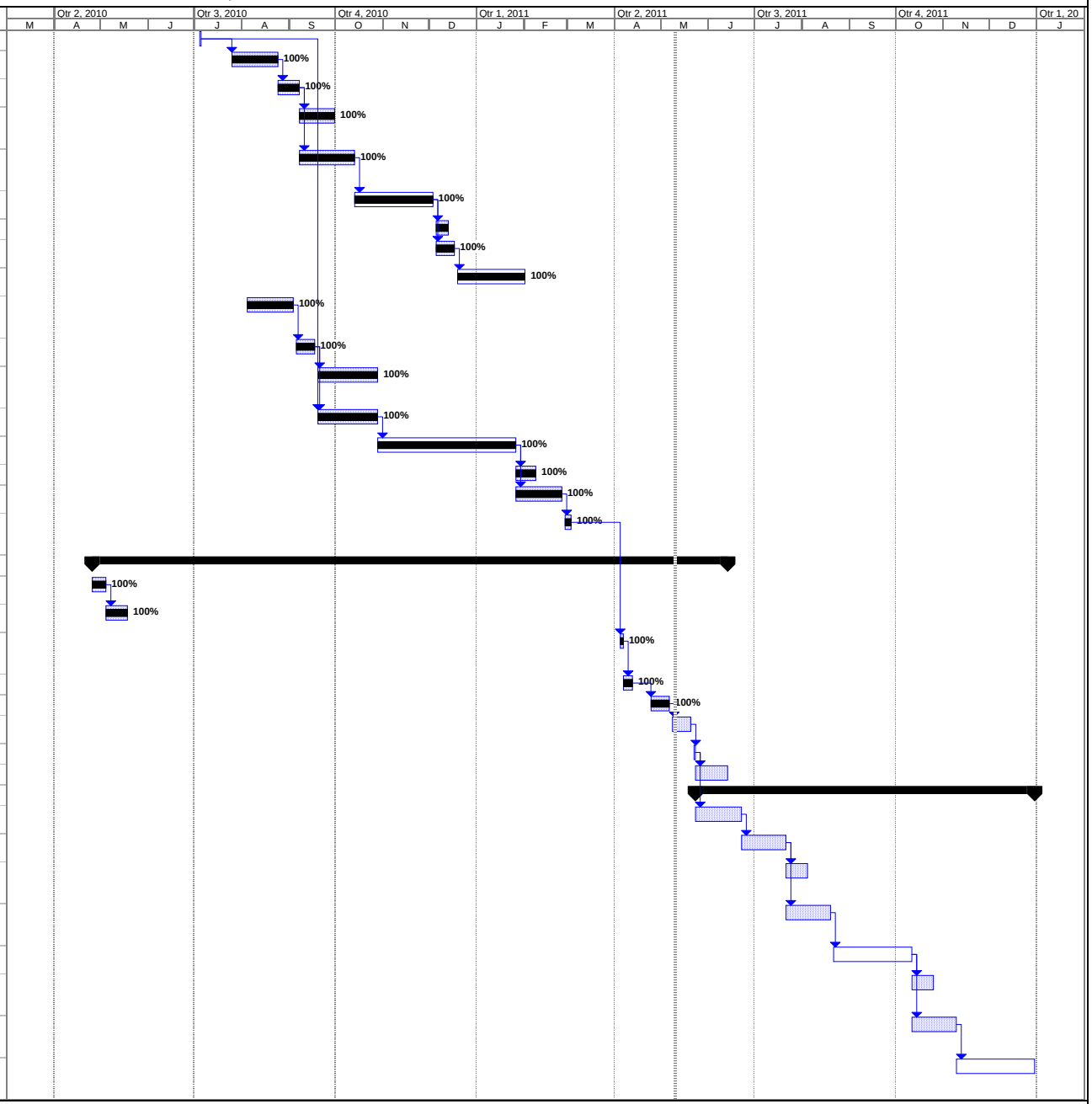


Project: Group 2 schedule
Date: Tue 5/10/11

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

WEEKLY REPORT

Prime Contracts No:	W912QR-10-P-0058		**Report No.**	6
PIKA Projects #:	10-08-130		**Date:**	5-9-11 to 5-13-11
Project:	RVAAP Compliance Rest. Site-CC-RVAAP-80 & Other Environmental Services, Ravenna Army Ammunition Plant, Ravenna, Ohio			

Summary of Activities:

- Completed geophysical investigation of the Group 2 propellant can tops area.
- Marked and surveyed all the identified anomaly areas.
- Initiated geophysical data report.

Others:

- Conducted daily safety briefings.

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

Visitors: Eileen Mohr and Todd Fisher – Ohio EPA. Visited the site to look at the grouping of anomalies flagged by the geophysicist. A total of 5 separate areas containing anomalies were detected across the site and marked with pin flags. Based on geographic spacing of the areas, discussions will be needed between all stakeholders to decide on path forward relative to the surface soil samples that will be collected at the site. A meeting will be scheduled upon receipt of the completed geophysical maps to help aid in the decision making.

Work Completed:

	This Week	Cumulative to-date
Surface clearance operations	-	100%
Brush Clearing	-	100%
Geophysical Investigation	90%	90%
Conducting MI Sampling	-	0%
Final Report Preparation	-	0%

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
None	None	None	Not Applicable

Major Problems and Resolution: None.

Schedule for Next Week

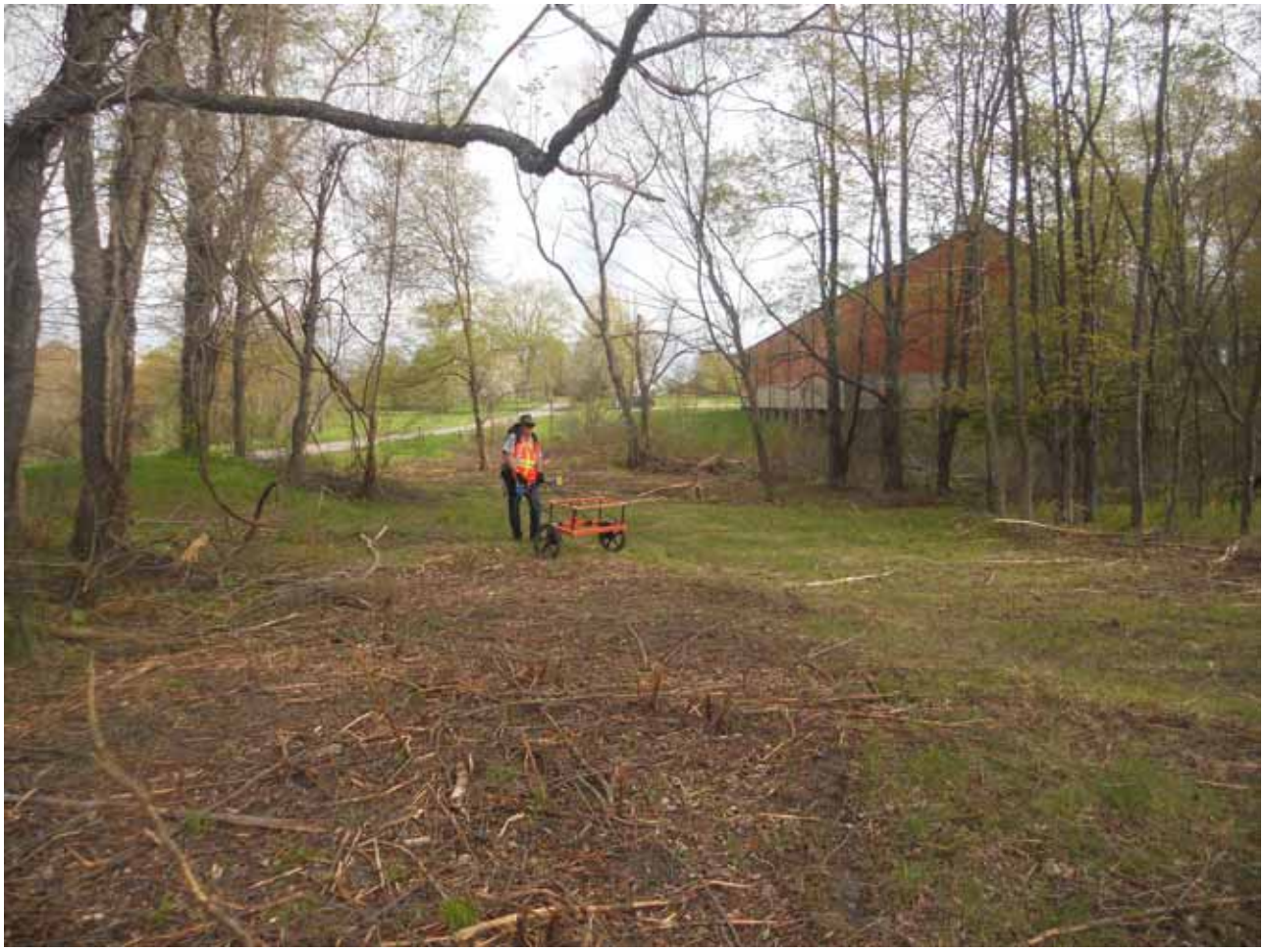
- Continue preparation of geophysical data report.
- Discuss path forward for the MI sampling operations based on the geophysical data obtained at the site.

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

Surveying and installing site grids at Group 2 area to facilitate the geophysical survey.



Pictures showing geophysical survey operations at RVAAP Group 2 propellant can tops site.

Schedule

Project Schedule
Compliance restoration Site CC-RVAAP-80 and Other Environmental Services
Ravenna Army Ammunition Plant, Ravenna, Ohio

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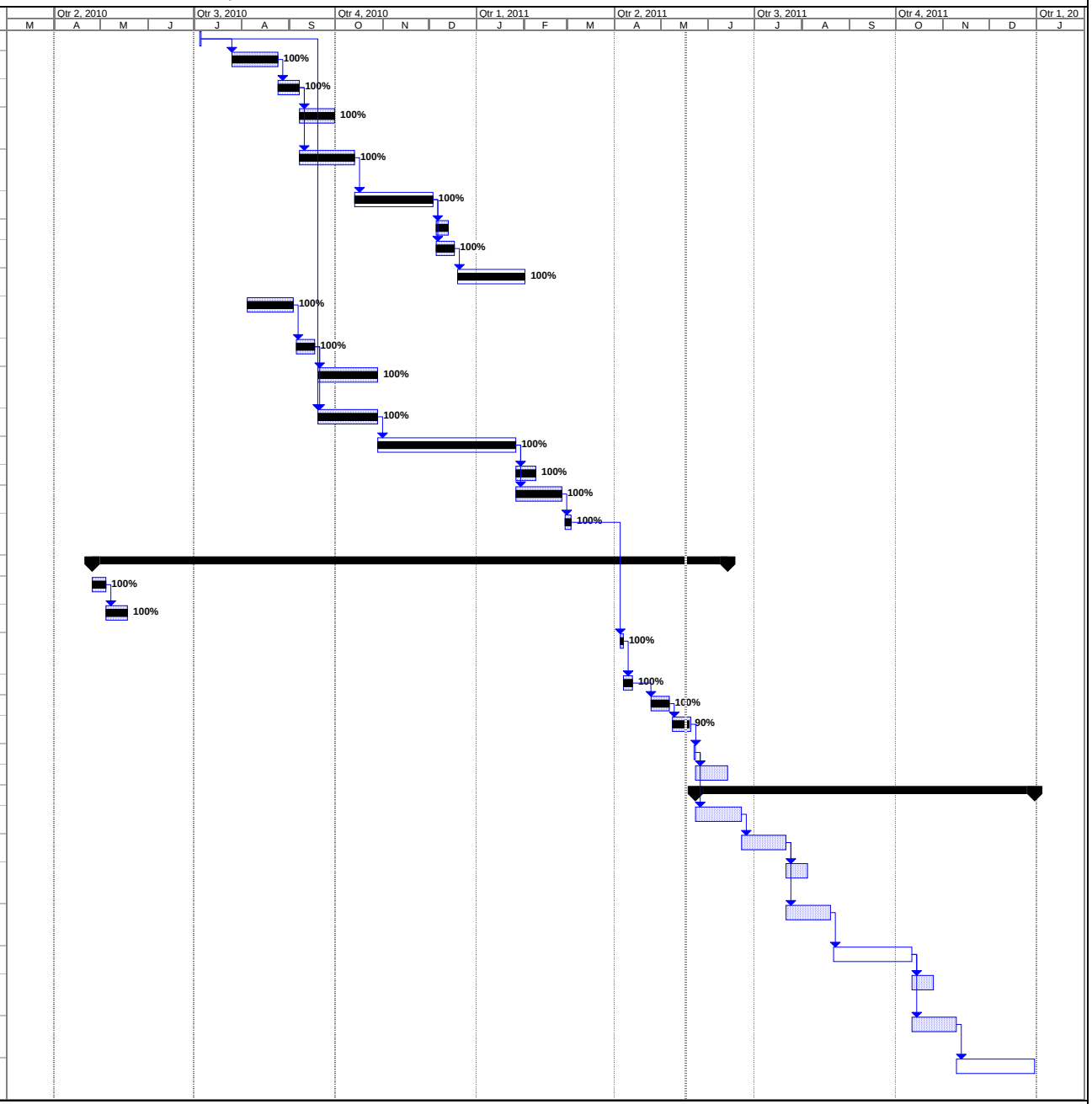
29	USACE Review of Pre-draft Report	21 days	Thu 6/23/11	Thu 7/21/11	28
30	Respond to USACE Comments on Pre-draft Report	10 days	Fri 7/22/11	Thu 8/4/11	29
31	Prepare and submit Draft Report for OEPA/Stakeholder review	21 days	Fri 7/22/11	Fri 8/19/11	29
32	Review Draft by OEPA/Stakeholders	37 days	Mon 8/22/11	Tue 10/11/11	31
33	Respond to OEPA/Stakeholder Comments on Pre-draft Report	10 days	Wed 10/12/11	Tue 10/25/11	32
34	Revise doc and Submit Final Iteration	21 days	Wed 10/12/11	Wed 11/9/11	32
35	Review Final Iteration by OEPA	37 days	Thu 11/10/11	Fri 12/30/11	34



Project: Group 2 schedule
Date: Tue 5/17/11

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

WEEKLY REPORT

Prime Contracts No:	W912QR-10-P-0058		**Report No.**	7
PIKA Projects #:	10-08-130		**Date:**	5-16-11 to 5-20-11
Project:	RVAAP Compliance Rest. Site-CC-RVAAP-80 & Other Environmental Services, Ravenna Army Ammunition Plant, Ravenna, Ohio			

Summary of Activities:

- Received EM-61 data maps from Geophysicist to further aid in discussion relative to selecting the surface sample locations.

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
Surface clearance operations	-	100%
Brush Clearing	-	100%
Geophysical Investigation	-	95%
Conducting MI Sampling	-	0%
Final Report Preparation	-	0%

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
None	None	None	Not Applicable

Major Problems and Resolution: None.

Schedule for Next Week

- Conduct surface soil sampling operations.

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

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

Schedule

Project Schedule
Compliance restoration Site CC-RVAAP-80 and Other Environmental Services
Ravenna Army Ammunition Plant, Ravenna, Ohio

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Contract Award**	1 day	Mon 7/5/10	Mon 7/5/10	
2	Prepare Pre-draft PMP and SSHP	22 days	Mon 7/26/10	Tue 8/24/10	1
3	Army review Pre-Draft Work Plans	10 days	Wed 8/25/10	Tue 9/7/10	2
4	Pre-draft comment resolution for PMP and SSHP	17 days	Wed 9/8/10	Thu 9/30/10	3
5	Develop Draft PMP and SSHP and submit to OEPA/Stakeholders	26 days	Wed 9/8/10	Wed 10/13/10	3
6	Army/OEPA Review of Draft PMP and SSHP	37 days	Thu 10/14/10	Fri 12/3/10	5
7	Draft Comment Resolution	6 days	Mon 12/6/10	Mon 12/13/10	6
8	Develp Final PMP and SSHP Work Plans	10 days	Mon 12/6/10	Fri 12/17/10	6
9	Army/OEPA Review of Final PMP and SSHP Plans	32 days	Mon 12/20/10	Tue 2/1/11	8
10	Prepare Pre Draft Work Plan, SAP and QAAP	22 days	Thu 8/5/10	Fri 9/3/10	
11	Army review of Pre Draft Work Plan, SAP and QAPP	10 days	Mon 9/6/10	Fri 9/17/10	10
12	Pre-draft comment resolution for Work Plan, SAP and QAAP	29 days	Mon 9/20/10	Thu 10/28/10	11
13	Develop Draft WP, SAP and QAPP	29 days	Mon 9/20/10	Thu 10/28/10	11,1
14	Army/OEPA review of Draft WP, SAP and QAPP	64 days	Fri 10/29/10	Wed 1/26/11	13
15	Draft Comment Resolution	9 days	Thu 1/27/11	Tue 2/8/11	14
16	Develop Final WP, SAP and QAPP	22 days	Thu 1/27/11	Fri 2/25/11	14
17	Army/OEPA Review of Final WP, SAP and QAPP	4 days	Mon 2/28/11	Thu 3/3/11	16
18	**Begin Field Work**	**296 days**	**Mon 4/26/10**	**Mon 6/13/11**	
19	Submit Water Removal Letter work plan for	7 days	Mon 4/26/10	Tue 5/4/10	
20	Conduct Water removal At LL2 bldg 802	10 days	Wed 5/5/10	Tue 5/18/10	19
21	Mobilization for Geophysical Study at Group 2	2 days	Tue 4/5/11	Wed 4/6/11	17
22	Surface Sweep	4 days	Thu 4/7/11	Tue 4/12/11	21
23	Brush Clearing	10 days	Mon 4/25/11	Fri 5/6/11	22
24	Geophysical investigation at Group 2	10 days	Mon 5/9/11	Fri 5/20/11	23
25	Soil Sampling	1 day	Mon 5/23/11	Mon 5/23/11	24
26	Disposal of IDW	15 days	Tue 5/24/11	Mon 6/13/11	25
27	**Investigation Report**	**159 days**	**Tue 5/24/11**	**Fri 12/30/11**	
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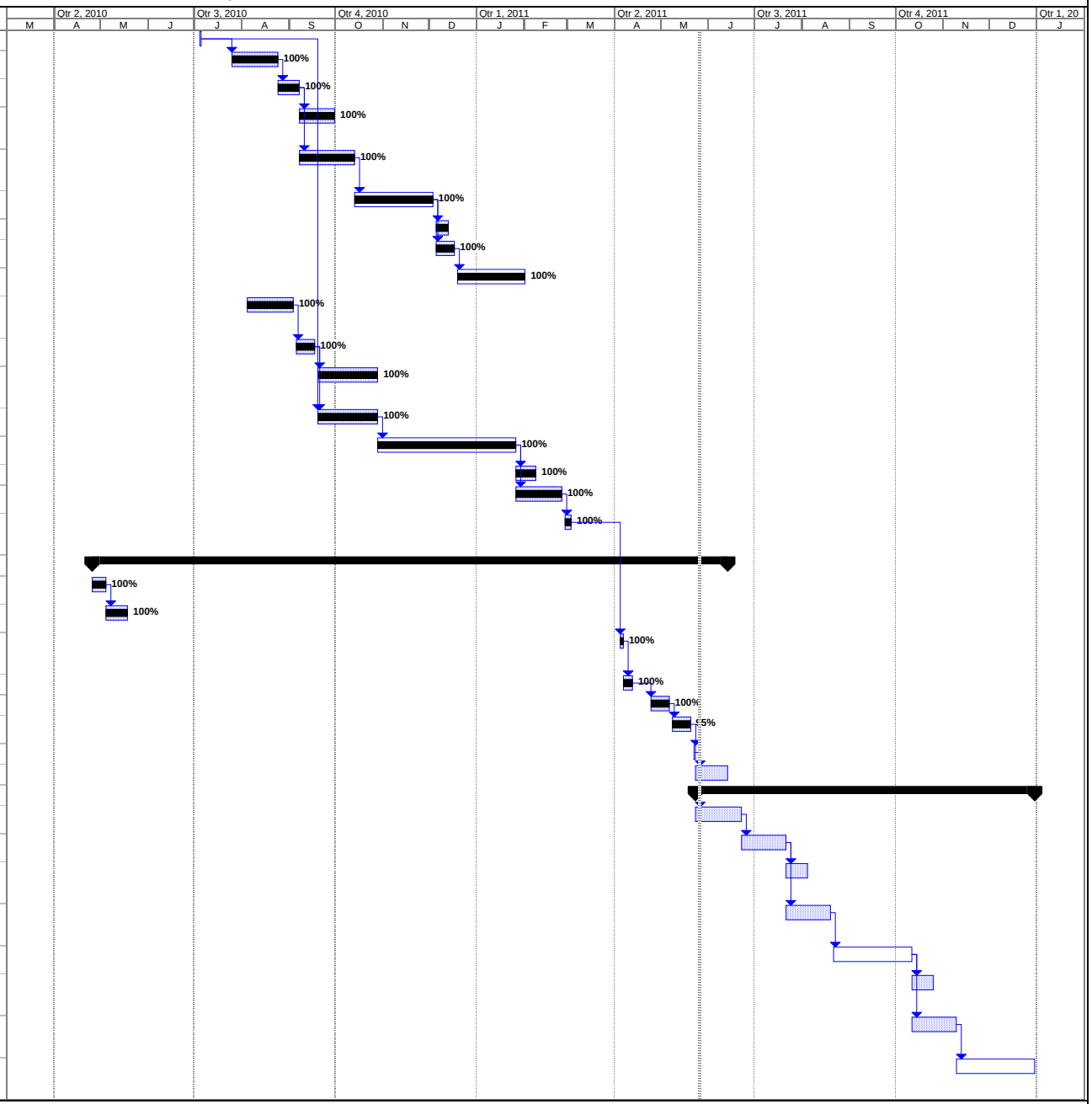

Project: Group 2 schedule
Date: Thu 5/26/11

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

WEEKLY REPORT

Prime Contracts No:	W912QR-10-P-0058		**Report No.**	8
PIKA Projects #:	10-08-130		**Date:**	5-23-11 to 5-27-11
Project:	RVAAP Compliance Rest. Site-CC-RVAAP-80 & Other Environmental Services, Ravenna Army Ammunition Plant, Ravenna, Ohio			

Summary of Activities:

- Based upon results of the geophysical delineation, a site visit was conducted with Ohio EPA representative Eileen Mohr and PIKA representatives Brian Stockwell and Jim King on May 25, 2011 to select the locations and boundaries of the Multi Increment (MI) surface soil sample areas. See attached figure for the locations of the areas that were selected for each sample (i.e., areas 1, 2, and 3).
- Collected 3 Multi Increment (MI) surface soil samples on May 26, 2011. All samples were collected in accordance with the approved work plan.

Others:

- Conducted daily safety briefings.

Remarks (include directions received from client's representative or regulators, visitors, compliance notices received, pertinent information) Visitors: Eileen Mohr – Ohio EPA. Conducted site visit to select location and boundaries of the MI surface soil samples.

Work Completed:

	This Week	Cumulative to-date
Surface clearance operations	-	100%
Brush Clearing	-	100%
Geophysical Investigation	5%	100%
Conducting MI Sampling	95%	95%
Final Report Preparation	-	0%

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
None	None	None	Not Applicable

Major Problems and Resolution: None.

Schedule for Next Week

Initiate preparation of investigation 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

Pictures showing MI surface soil sampling operations with UXO support.

MAP SHOWING MI SURFACE SOIL SAMPLE LOCATIONS

0'
100'
200'
300'
400'
500'
600'
700'
800'
11+00
10+00
9+00
8+00
7+00
6+00
5+00
4+00
3+00
2+00
1+00
0+00
-1+00
mV
Channel 2
Area 1
Area 2
Area 3

SCHEDULE

Project Schedule
Compliance restoration Site CC-RVAAP-80 and Other Environmental Services
Ravenna Army Ammunition Plant, Ravenna, Ohio

ID	Task Name	Duration	Start	Finish	Predecessors
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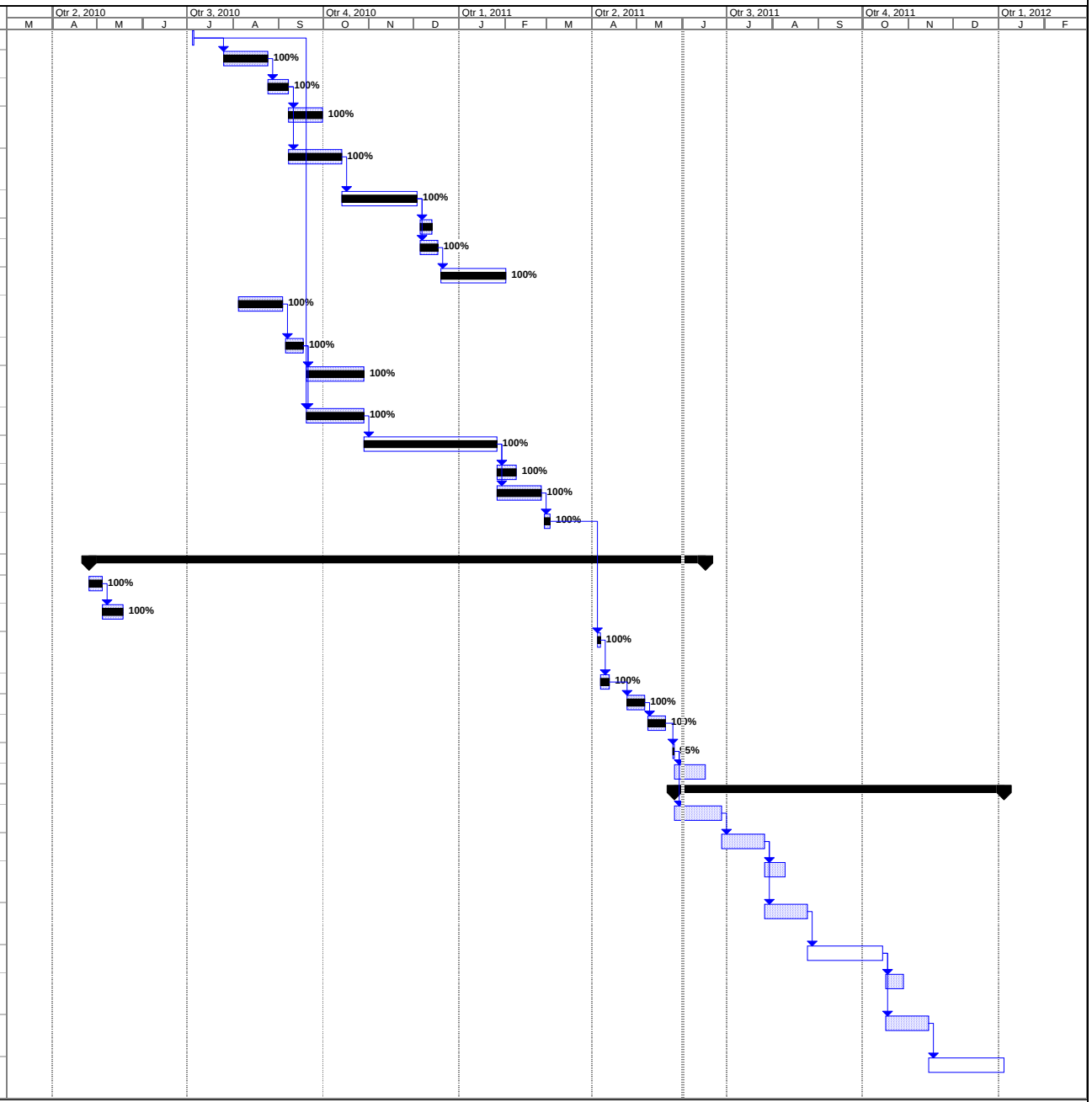


Project: Group 2 schedule
Date: Wed 6/1/11

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

Appendix D

Geophysical Report

Group 2 Propellant Can Top
Geophysical Survey
Ravenna Army Ammunition Plant

Prepared For
Mr. Brian Stockwell
PIKA International
Ravenna, Ohio

By

TERENCE M. HAMILL

May 20, 2011

GeoSearches, Inc.

200 Industrial Parkway, Suite 6B

Chagrin Falls, Ohio44022

(440) 893-0642

May 20, 2011

Mr. Brian Stockwell
PIKA International

SUBJECT: Group 2 Propellant Can Top

Geophysical Survey

Dear Mr. Stockwell:

GeoSearches, Inc has completed the Geophysical survey dated May12, 2011 at Group 2 site at the RVAAP.
This Full Report presents the results regarding the targeted survey, delineating the boundaries of the Propellant Can Top areas.
If you have further questions please contact GeoSearches, Inc it has been a pleasure working with you on this project.

Best regard's,

Terence M. Hamill
President / Principal Geophysicist
GeoSearches, Inc.

Table of Contents

Section One

SITE PROJECT AND DESCRIPTION

Introduction:

GeoSearches, Inc. was retained by PIKA International to conduct a Geophysical survey at the Ravenna Army Ammunition Plant. The object of the survey was to delineate the areas within the designated site Group 2 containing Propellant Can Tops.

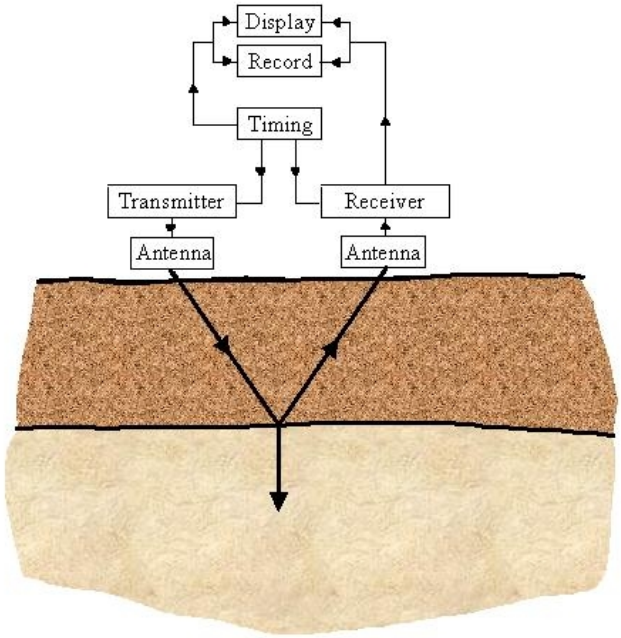
The Geophysical survey was conducted over an area approximately 12 acres in size.

The non-intrusive, subsurface investigation was conducted using Electromagnetics.

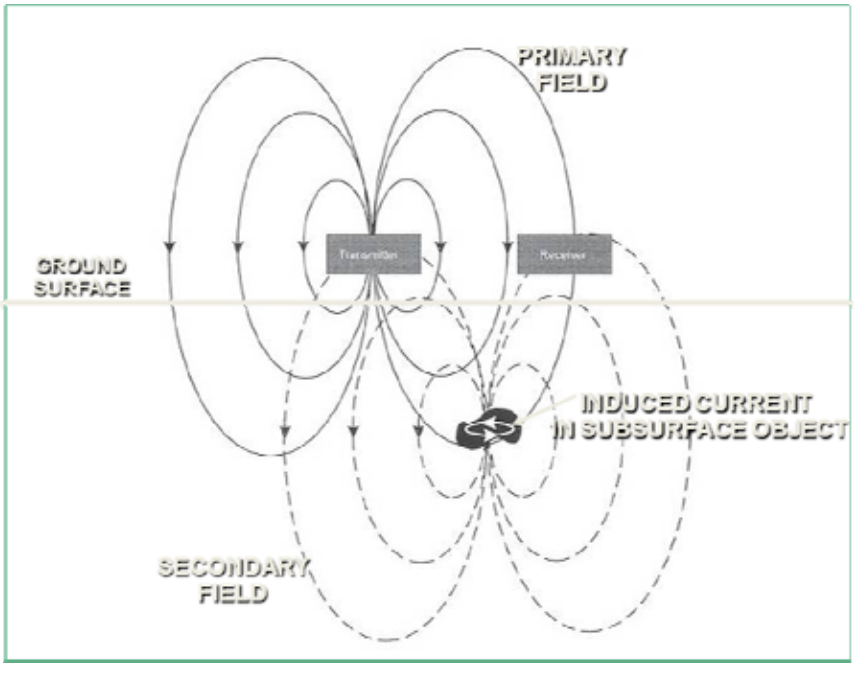
The EM61-MK2 consists of two 1-meter (m) by 0.5m rectangular coils arranged such that the source/receiver coil is located 40 centimeters (cm) below a second receiver coil. An electromagnetic pulse induces subsurface eddy currents with associated secondary magnetic fields. The decay of the secondary magnetic fields induced in subsurface materials is measured by the receiver coil(s) and digitally recorded.

The EM61-MK2 is capable of detecting all metals and is generally not affected by magnetic geology or soils. The EM61-MK2 may detect buried metal beyond four (4) feet below ground surface (ft bgs) depending on the size of the item and the contrast between the native soils/geology and the item. Additionally, the EM61-MK2 response is focused directly beneath the coils so the response from nearby metal structures (e.g., monitoring wells, fences, etc.) is minimal compared to other sensors such as a total field magnetometer.

Ground Penetrating Radar (GPR) GPR detects subsurface structures by transmitting radio frequency waves into the ground and monitoring the strength and time delay of the reflection. The returning signal can then be evaluated to locate subsurface anomalies. Anomalies can be caused by void spaces, differences in soil/bedrock texture, differences in soil/bedrock moisture content, differences in the sediment compaction, and the presence of subsurface structures such as pipelines.



GROUND PENETRATING RADAR THEORY DIAGRAM



EM61 MK2 ELECTROMAGNETIC THEORY DIAGRAM

Part One: Method

Before fieldwork was started, historical data and detailed diagrams were reviewed to provide background information on the site.

An instrument verification strip (IVS) was conducted over a known area with surface targets. This was conducted over the area that is known as Cluster 1 so that was well representative of the expected targets. The objective of the IVS is to verify that the geophysical detection system is operating properly. The IVS targets should be observed in the data with signals that are consistent with both historical measurements and physics-based model predictions. Adjacent measurements of the site noise determine whether targets of interest can be detected reliably to their depth of interest under the site conditions.

System daily tests were also conducted which consisted of a Static Noise test, Spike Test and cable shake test. These tests were conducted before and after the geophysical survey.

A preliminary straight-line GPR survey was conducted at the beginning of the investigation, establishing the typical response based on the site geology and subsurface structures. The survey was conducted by moving the GPR equipment along the grid lines in two, perpendicular directions. The GPR data were reviewed in the field before processing. This review consisted of data quality and also specifically in this case if excavated areas could be interpreted through the raw data collection.

The Trimble RTK GPS was used to augment geophysical data and improve geophysical mapping through visual observations made during site walk-over. During this process, the GPS was used to record the positions of cultural features (e.g., signposts, monitor wells, etc.) so that these features can be accounted for during the interpretation of the geophysical data.

The survey was conducted using Geonics EM-61 MK 2 and a Noggin GPR from Sensors and Software, Inc., with a 250MHz antenna. The data were acquired using the common-offset reflection profiling method. The depth of penetration ranged from 0 to 15 feet below the surface.

A surveyed grid was laid out over the survey area to facilitate GPR data collection and ensure complete coverage with both the GPS-integrated EM61 and the GPR. Numbered points were spaced 100 feet apart, and data acquisition intervals were 5 feet apart. The survey equipment used was:

TDS Ranger Data Collector
Topcon Total Station
Topcon Hiper Lite GPS
ODOT VRS Network

Part Two: Processing

This the data processing procedures and interpretation of results based on the geophysical information collected during the geophysical survey. Geosoft Oasis Montaj (Oasis) was the primary software used to complete data processing tasks. All data grids and anomalies were uploaded.

At the end of the field day the field geophysicist uploaded the data to the office computer, where the data was archived, backed-up, and processed and analyzed. The data processing sequence included verifying the validity of the data using the performance metrics, assessment of the track path and spatial sample density, latency correction, data leveling, and color-coded image generation utilizing software from the equipment manufacturers and Geosoft Oasis Montaj. Subsequent to the processing and review of the data, color-coded images of the geophysical sensor data were created for review and planning of the next day's field activities.

GeoSearches utilized the following software to process the data:

Oasis for latency correction; data leveling; interpolation and generation of color-coded images; and statistical analysis of the data in terms of the performance metrics such as spatial sample density, static background, and repeat tests.

The Ground Penetrating Radar data was processed by applying filters and gains to better define the anomalies of interest. Tools used to process the data and improve image quality included SPIVIEW TOOLS and WIN EKKO software from Sensors and Software, Inc.

Once each data survey is loaded and the grid properly oriented spatially, a short (3-sample) temporal median trim filter is applied to each GPR trace (one gridline) to attenuate noise spikes that degrades the data quality. A residual median filter is then applied to attenuate the wow (Short range GPR signals often possess a low-frequency component, commonly referred to as a "wow" that causes amplitude distortion along an individual trace), this filtering attenuates both the low and high frequency components of the wow, without adding precursors or other artifacts to the wavelet.

Time zero determination and datuming is also performed.

The data is then processed by applying amplitude compensation. For each GPR survey line, the rectified-amplitude versus time fall-off is determined. The inverse of this curve is scaled by a multiplier (0.3) to form the gain function. The multiplier is used to slightly reduce the gain function so that anomalously high amplitude values are not clipped after amplitude compensation.

Part Three: Interpretation and data quality

After completion of the data processing, each GPR and EM reflection image was evaluated to:

(1) Evaluate the GPR and EM penetration depth and resolution of the data collected at 250MHz and compare reflection character of the two, perpendicular line orientations; and

(2) Interpret GPR and EM reflections and image patterns as bounding surfaces and architectural elements in profile.

(3) EM61 anomalies that correlated with known surface features such as an electric junction box or utilities are not reported. All other anomalies that were not caused by known surface features or utilities were further analyzed with corresponding GPR data.

Section Two

CONDITIONS and OBJECTIVE

Part One: Conditions

The Geophysical survey included:

- The survey area was 95% accessible and covered all areas of interest. The larger wetter areas in the North were difficult to acquire data in.
- Project area consisted of grass, gravel tracks and brush.

Part Two: Objective

The primary objectives of the Geophysical survey were to determine the boundaries of the Propellant Can Tops.

Section Three

RESULTS

FIGURE 1

RVAAP GROUP-2 GEOPHYSICAL PROJECT AREA

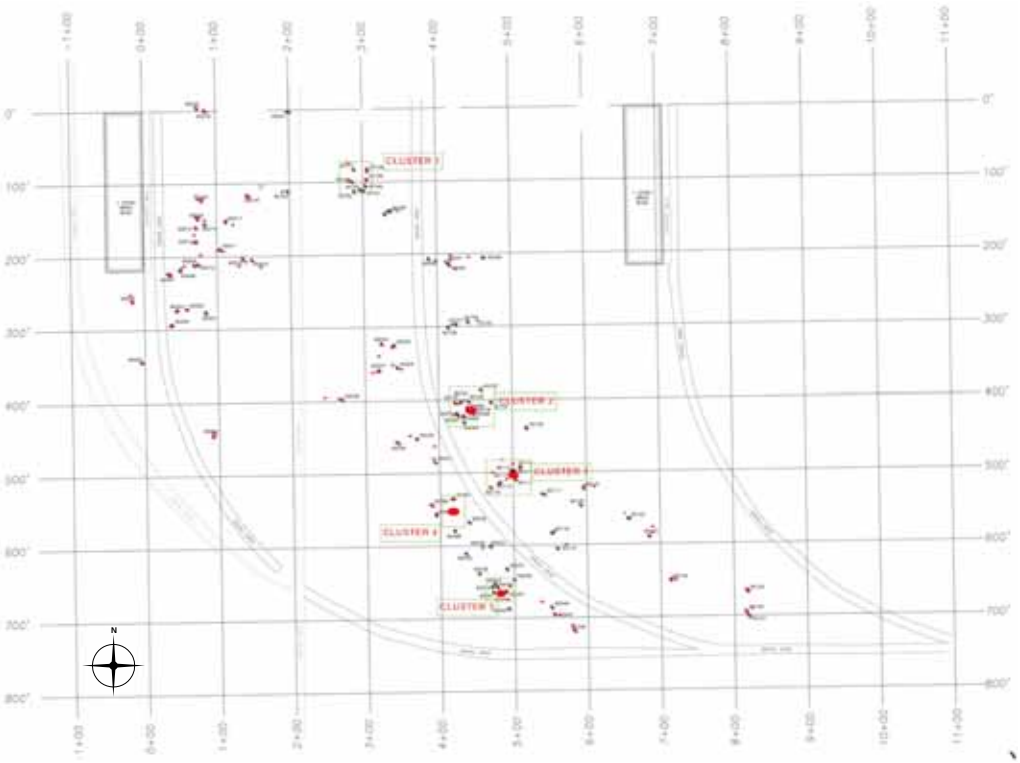
GEOSEARCHES

TEL: 440 893-0642
FAX: 440 893-4023

Project Designer:	
PIKA INTERNATIONAL	
Project Contact:	
GeoSearches, Inc.	
Project #	WO#
RVAAP	
Date:	Rev. Date:
05/20/11	

FIGURE 2

RVAAP GROUP-2
ANOMALY CLUSTER AREAS



ANOMALY CLUSTER AREA

GEOSEARCHES

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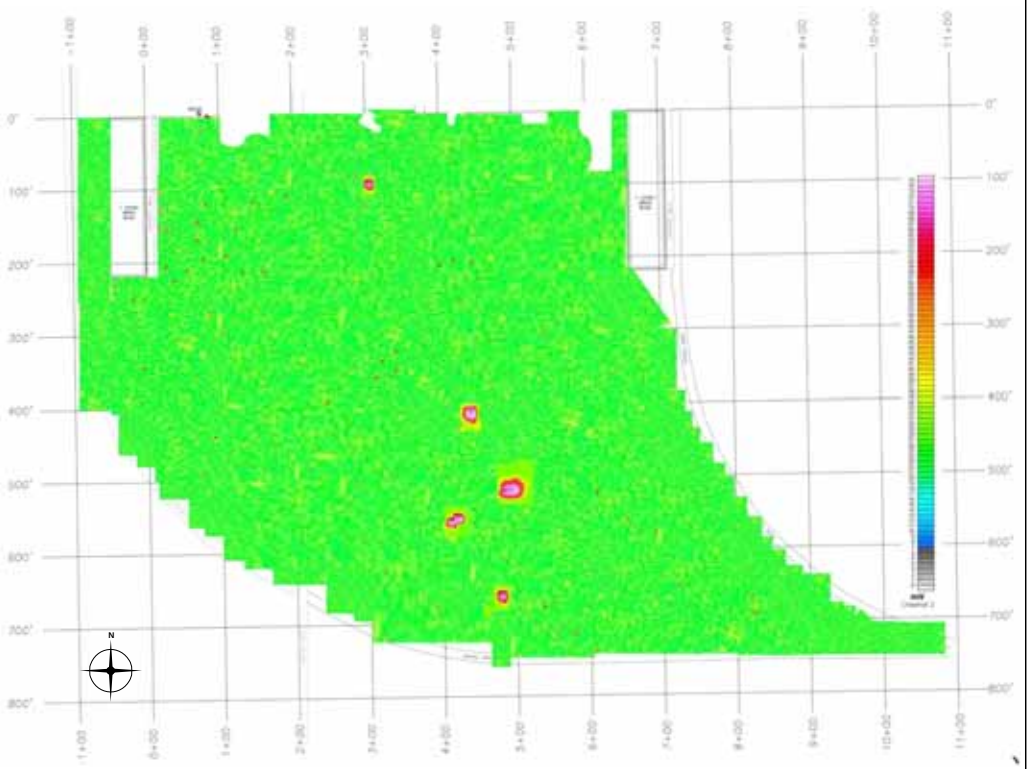
PIKA INTERNATIONAL	
Project Contact:	
GeoSearches, Inc.	
Project #	WO#
RVAAP	
Date:	Rev. Date:
05/20/11	

FIGURE 3

RVAAP GROUP-2
EM-61 MK2 PROCESSED DATA



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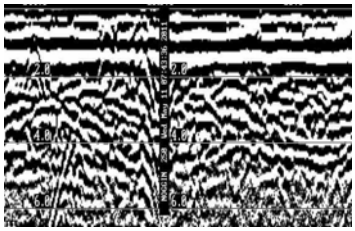
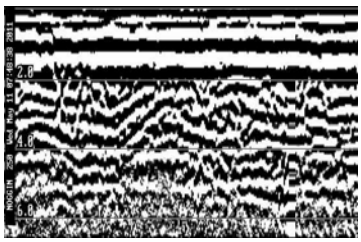
Project Designer:	
PIKA INTERNATIONAL	
Project Contact:	
GeoSearches, Inc.	
Project #	WO#
RVAAP	
Date:	Rev. Date:
05/20/11	

FIGURE 4

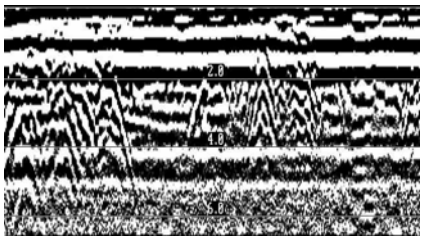
RVAAP GROUP-2
GROUND PENETRATING RADAR PROCESSED DATA



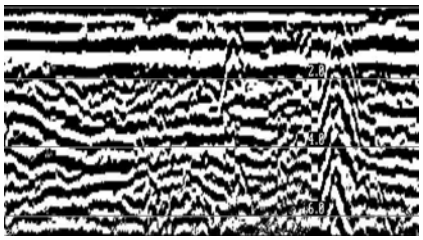
CLUSTER AREA 1



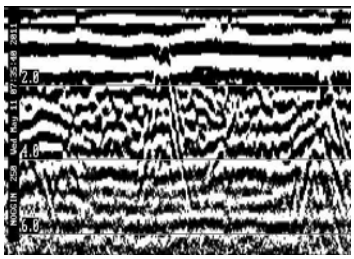
CLUSTER AREA 2



CLUSTER AREA 3



CLUSTER AREA 4



CLUSTER AREA 5

GEOSEARCHES

TEL: 440 893-0642
FAX: 440 893-4023

Project Designer:	
PIKA INTERNATIONAL	
Project Contact:	
GeoSearches, Inc.	
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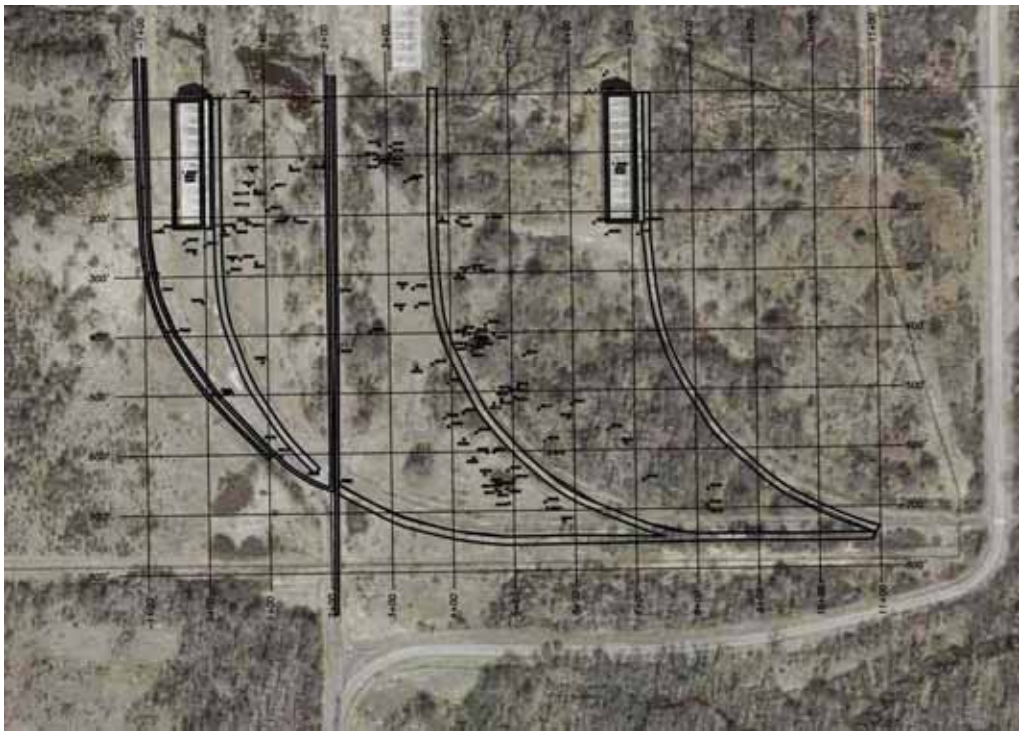
RVAAP	
Date:	Rev. Date:
05/20/11	

FIGURE 5

RVAAP GROUP-2
ANOMALY EXTENT



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TEL: 440 893-0642
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Project Designer:	
PIKA INTERNATIONAL	
Project Contact:	
GeoSearches, Inc.	
Project #	WO#
RVAAP	
Date:	Rev. Date:
05/20/11	

Results

The object of the Geophysical survey and the use of Ground Penetrating Radar and Electromagnetics were to delineate the areas that Propellant Can Tops exist and also to determine if areas had been excavated to bury the cans.

During the survey it was physically possible to see on the surface, Propellant Can Tops and also a few shot gun shells.

The EM61-MK2 survey data did display distinct areas of high anomaly density that can be seen in **Figures 2 and 3.** The signal data established that 5 areas exist within the survey area with anomalies close or on the surface and the processed data **[Figures 3 and 4]** suggests that all of these areas have anomalies that are on the surface or just below the surface and < 9 inches in depth.

Due to the anomaly density of the 5 areas it is difficult to characterize individual anomalies.

The "white areas" **[Figure 3]** in the north portion of the defined survey boundary represent locations with limited coverage (buildings) and due to wet conditions that could not be accessed.

The EM data did not detect any other Propellant Can Top areas apart from the 5 distinct anomaly areas.

Smaller events near the surface did register on the raw data when collecting, and these have been noted, however these events were not the project size anomalies. At this stage the anomalies cannot be identified.

Ground Penetrating Radar was utilized after all determined clustered areas were established to ascertain if the cluster areas had been excavated [**Figure 4.]** The GPR did establish that metallic anomalies did exist at near surface depths and also clarified that the objects had been dumped there as the subsurface lithology was consistent throughout with no evidence of excavation.

All anomalies have been surveyed and coordinates can be found with attached on spreadsheet.

Conclusion

The Geophysical investigations performed at the Group2 Site have identified areas of dense anomalies at the 5 locations. The data collection achieved the goal as to identifying the areas of Propellant Can Tops.

Further Geophysical investigations in the future, with tighter parameters may be needed to identify the smaller anomalies found within the survey area.

General Qualifications

The data presented herein are interpreted. No warranty, certification, or statement of fact, either expressed or implied, regarding actual subsurface conditions within the surveyed area is contained herein. No interpretation of subsurface conditions can be made for areas not surveyed.

Appendix E

Summary Table, Field Sample Reports and Lab Results

TABLE 1 - SUMMARY OF MULTI-INCREMENT SOIL SAMPLES INORGANIC RESULTS

ANALYTE**, UNITS, METHOD NO.	FWCUGs for National Guard Trainee HI=1 mg/kg	FWCUGs for National Guard Trainee Risk = 10^{-5} mg/kg	Regional Screening Level (RSL) mg/kg	Surface Soil Background Criteria mg/kg	PCTss-001M-0001-SO	PCTss-001M-0001-DUP	PCTss-002D-0001-SO	PCTss-002M-0001-SO	PCTss-002M-0001-ER	PCTss-003M-0001-SO	TRIP BLANK
Sample Date					5/26/2011	5/26/2011	5/26/2011	5/26/2011	5/26/2011	5/26/2011	5/27/2011
									UG/L		UG/L
METALS 6010B mg/kg											
Arsenic	1140	27.8	0.39	15.4	--	--	--	8.4	< RL	--	--
Lead	351	--	400	26.1	--	--	--	**34.1**	< RL	--	--
Selenium	--	--	390	1.4	--	--	--	< RL	0.0206 B	--	--
Thallium	477	--	--	0	--	--	--	< RL	< RL	--	--
Silver	31049	--	390	0	--	--	--	< RL	< RL	--	--
Aluminum	34960	--	77000	17700	--	--	--	10600	< RL	--	--
Barium	3506	--	15000	88.4	--	--	--	81.7	< RL	--	--
Beryllium	--	--	160	0.88	--	--	--	0.45	< RL	--	--
Calcium (essential nutrient)	--	--	--(n)	15800	--	--	--	954	< RL	--	--
Cadmium	3292	109	70	0.0	--	--	--	0.13 B	< RL	--	--
Cobalt	140	70.3	23	10.4	--	--	--	7.7	< RL	--	--
Chromium, hexavalent	56.1	16.4	--	--	--	--	--	2.42	< RL	--	--
Copper	253680	--	3100	17.7	--	--	--	12.1	< RL	--	--
Iron	1000000	--	55000	23100	--	--	--	17600	< RL	--	--
Potassium (essential nutrient)	--	--	--(n)	927	--	--	--	654	< RL	--	--
Magnesium (essential nutrient)	--	--	--(n)	3030	--	--	--	1770	< RL	--	--
Manganese	--	--	1800	1450	--	--	--	833	< RL	--	--
Sodium (essential nutrient)	--	--	--(n)	123	--	--	--	35.6 B	< RL	--	--
Nickel	126391	--	--	21.1	--	--	--	18.5	< RL	--	--
Antimony	1753	--	31	0.96	--	--	--	< RL	< RL	--	--
Vanadium	23045	--	5.5	31.1	--	--	--	24.4	< RL	--	--
Zinc	1000000	--	23000	61.8	--	--	--	**62.4**	< RL	--	--
Mercury 7471A mg/kg											
Mercury	1722	--	--	0.036			--	**0.049**	< RL	--	--
Perchlorate 6860 ug/kg											
Perchlorate	--	--	--	0.00	**0.000093 J**	**0.00011 J**	--	< RL	< RL	**0.000093 J**	--
Cyanide 9012 mg/kg											
Cyanide	--	--	--	0.00	--	--	--	0.19 B	< RL	--	--

-- = data not available
ug/L = micrograms per liter (parts per billion)
ug/kg = micrograms per kilogram (parts per billion)
mg/kg = milligrams per kilogram (parts per million)
Inorganics:
RL = Reporting Limit
< RL = Indicates that the compound was analyzed for but not detected
J = Method blank contamination. The associated method blank contains the target analyte at a reportable level.
B = Estimated result. Result is less than Reporting Limit
E = Matrix Interference
Highlighted = > Regional Screening Level
Bold = > Background
Italics = > Cleanup goals

TABLE 2 - SUMMARY OF MULTI-INCREMENT SOIL SAMPLES ORGANIC RESULTS

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Sample Date					5/26/2011	5/26/2011	5/26/2011	5/26/2011	5/26/2011	5/26/2011	5/27/2011
									UG/L		UG/L
EXPLOSIVES mg/kg											
1,3,5-Trinitrobenzene	165422	--	2200	--	--	--	--	< RL	< RL	--	--
1,3-Dinitrobenzene	596	--	6.1	--	--	--	--	< RL	< RL	--	--
2,4,6-Trinitrotoluene	2488	4643	19	--	--	--	--	< RL	< RL	--	--
2,4-Dinitrotoluene	6519	134	1.6	--	--	--	--	< RL	< RL	--	--
2,6-Dinitrotoluene	3309	136	61	--	--	--	--	< RL	< RL	--	--
2-Amino-4,6-Dinitrotoluene	1237	--	150	--	--	--	--	< RL	< RL	--	--
2-Nitrotoluene	59611	726	2.9	--	--	--	--	< RL	< RL	--	--
3-Nitrotoluene	--	--	6.1	--	--	--	--	< RL	< RL	--	--
4-Amino-2,6-Dinitrotoluene	1237	--	150	--	--	--	--	< RL	< RL	--	--
4-Nitrotoluene	59611	9818	30	--	--	--	--	< RL	< RL	--	--
HMX	234645	--	3800	--	--	--	--	< RL	< RL	--	--
Nitrobenzene	--	--	4.8	--	--	--	--	< RL	< RL	--	--
PETN	--	--	--	--	--	--	--	< RL	< RL	--	--
RDX	17113	1452	5.5	--	--	--	--	< RL	< RL	--	--
Tetryl	--	--	240	--	--	--	--	< RL	< RL	--	--
Propellants mg/kg											
Nitrocellulose	--	--	180000000	--	1.1 B	0.82 B	--	< RL	< RL	< RL	--
Nitroglycerine	--	9818	6.1	--	< RL	< RL	--	< RL	< RL	< RL	--
Nitroguanidine	--	--	6100	--	0.063 J	0.12 J	--	< RL	< RL	0.17 J	--
VOCS 8260B ug/kg											
Chloromethane	--	--	120	--	--	--	< RL	--	--	--	< RL
Bromomethane	--	--	7.3	--	--	--	< RL	--	--	--	< RL
Vinyl chloride	--	--	0.06	--	--	--	< RL	--	--	--	< RL
Chloroethane	--	--	15000	--	--	--	< RL	--	--	--	< RL
Methylene Chloride	--	--	11	--	--	--	< RL	--	--	--	< RL
Acetone	--	--	61000	--	--	--	0.0053 J,B	--	--	--	< RL
Carbon disulfide	--	--	820	--	--	--	< RL	--	--	--	< RL
1,1-Dichloroethene	--	--	3.3	--	--	--	< RL	--	--	--	< RL
1,1-Dichloroethane	--	--	240	--	--	--	< RL	--	--	--	< RL
1,2-Dichloroethene (total)	--	--	150	--	--	--	< RL	--	--	--	< RL
Chloroform	--	--	0.29	--	--	--	< RL	--	--	--	< RL
1,2-Dichloroethane	--	--	0.43	--	--	--	< RL	--	--	--	< RL
2-Butanone	--	--	28000	--	--	--	< RL	--	--	--	< RL
1,1,1-Trichloroethane	--	--	8700	--	--	--	< RL	--	--	--	< RL
Carbon tetrachloride	--	--	0.61	--	--	--	< RL	--	--	--	< RL
Bromodichloromethane	--	--	0.27	--	--	--	< RL	--	--	--	< RL
1,2-Dichloropropane	--	--	0.89	--	--	--	< RL	--	--	--	< RL

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cis-1,3-Dichloropropene	--	--	1.7	--	--	--	< RL	--	--	--	< RL
Trichloroethene	--	--	2.8	--	--	--	< RL	--	--	--	< RL
Dibromochloromethane	--	--	0.68	--	--	--	< RL	--	--	--	< RL
1,1,2-Trichloroethane	--	--	1.1	--	--	--	< RL	--	--	--	< RL
Benzene	--	--	1.1	--	--	--	< RL	--	--	--	< RL
trans-1,3-Dichloropropene	--	--	1.7	--	--	--	< RL	--	--	--	< RL
Bromoform	--	--	61	--	--	--	< RL	--	--	--	< RL
4-Methyl-2-pentanone	--	--	5300	--	--	--	< RL	--	--	--	< RL
2-Hexanone	--	--	210	--	--	--	< RL	--	--	--	< RL
Tetrachloroethene	--	--	0.55	--	--	--	< RL	--	--	--	< RL
1,1,2,2-Tetrachloroethane	--	--	0.56	--	--	--	< RL	--	--	--	< RL
Toluene	--	--	5000	--	--	--	< RL	--	--	--	< RL
Chlorobenzene	--	--	290	--	--	--	< RL	--	--	--	< RL
Ethylbenzene	--	--	5.4	--	--	--	< RL	--	--	--	< RL
Styrene	--	--	6300	--	--	--	< RL	--	--	--	< RL
Xylenes (Total)	--	--	630	--	--	--	< RL	--	--	--	< RL
SVOC 8270 mg/kg											
Phenol	--	--	18000	--	--	--	--	< RL	< RL	--	--
Bis(2-chloroethyl) ether	--	--	0.21	--	--	--	--	< RL	< RL	--	--
2-Chlorophenol	--	--	390	--	--	--	--	< RL	< RL	--	--
1,3-Dichlorobenzene	--	--	--	--	--	--	--	< RL	< RL	--	--
1,4-Dichlorobenzene	--	--	2.4	--	--	--	--	< RL	< RL	--	--
1,2-Dichlorobenzene	--	--	1900	--	--	--	--	< RL	< RL	--	--
2-Methylphenol	--	--	3100	--	--	--	--	< RL	< RL	--	--
2,2-oxybis (1-chloropropane)	--	--	--	--	--	--	--	< RL	< RL	--	--
4-Methylphenol	--	--	310	--	--	--	--	< RL	< RL	--	--
N-Nitroso-di-n-propylamine	--	18.8	0.069	--	--	--	--	< RL	< RL	--	--
Hexachloroethane	--	--	35	--	--	--	--	< RL	< RL	--	--
Nitrobenzene	--	--	4.8	--	--	--	--	< RL	< RL	--	--
Isophorone	--	--	510	--	--	--	--	< RL	< RL	--	--
2-Nitrophenol	--	--	--	--	--	--	--	< RL	< RL	--	--
2,4-Dimethylphenol	--	--	1200	--	--	--	--	< RL	< RL	--	--
Bis(2-chloroethoxy)methane	17883	--	180	--	--	--	--	< RL	< RL	--	--
2,4-Dichlorophenol	--	--	180	--	--	--	--	< RL	< RL	--	--
1,2,4-Trichlorobenzene	--	--	22	--	--	--	--	< RL	< RL	--	--
Naphthalene	15407	--	3.6	--	--	--	--	< RL	< RL	--	--
4-Chloroaniline	--	--	2.4	--	--	--	--	< RL	< RL	--	--
Hexachlorobutadiene	--	--	6.2	--	--	--	--	< RL	< RL	--	--
4-Chloro-3-methylphenol	--	--	--	--	--	--	--	< RL	< RL	--	--
2-Methylnaphthalene	--	--	310	--	--	--	--	< RL	< RL	--	--
Hexachlorocyclopentadiene	--	--	370	--	--	--	--	< RL	< RL	--	--

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2,4,6-Trichlorophenol	--	--	44	--	--	--	--	< RL	< RL	--	--
2,4,5-Trichlorophenol	--	--	6100	--	--	--	--	< RL	< RL	--	--
2-Chloronaphthalene	--	--	6300	--	--	--	--	< RL	< RL	--	--
2-Nitroaniline	--	--	610	--	--	--	--	< RL	< RL	--	--
Dimethyl phthalate	--	--	--	--	--	--	--	< RL	< RL	--	--
Acenaphthylene	--	--	--	--	--	--	--	< RL	< RL	--	--
2,6-Dinitrotoluene	--	--	61	--	--	--	--	< RL	< RL	--	--
3-Nitroaniline	--	--	--	--	--	--	--	< RL	< RL	--	--
Acenaphthene	--	--	3400	--	--	--	--	< RL	< RL	--	--
2,4-Dinitrophenol	--	--	120	--	--	--	--	< RL	< RL	--	--
2-Nitrophenol	--	--	--	--	--	--	--	< RL	< RL	--	--
Dibenzofuran	11922	--	78	--	--	--	--	< RL	< RL	--	--
2,4-Dinitrotoluene	--	--	1.6	--	--	--	--	< RL	< RL	--	--
Diethyl phthalate	--	--	49000	--	--	--	--	< RL	< RL	--	--
4-Chlorophenyl phenyl ether	--	--	--	--	--	--	--	< RL	< RL	--	--
Fluorene	114583	--	2300	--	--	--	--	< RL	< RL	--	--
4-Nitroaniline	--	--	24	--	--	--	--	< RL	< RL	--	--
4,6-Dinitro-2-methylphenol	--	--	--	--	--	--	--	0.14 J	< RL	--	--
n-Nitrosodiphenylamine	--		99	--	--	--	--	< RL	< RL	--	--
4-Bromophenyl phenyl ether	--	--	--	--	--	--	--	< RL	< RL	--	--
Hexachlorobenzene	--	--	0.3	--	--	--	--	< RL	< RL	--	--
Pentachlorophenol	56558	440	0.89	--	--	--	--	< RL	< RL	--	--
Phenanthrene	--	--	--	--	--	--	--	< RL	< RL	--	--
Anthracene	--	--	17000	--	--	--	--	< RL	< RL	--	--
Carbazole	--	8346	--	--	--	--	--	< RL	< RL	--	--
Di-n-butyl phthalate	--	--	6100	--	--	--	--	< RL	< RL	--	--
Fluoranthene	50868	--	2300	--	--	--	--	< RL	< RL	--	--
Pyrene	38151	--	1700	--	--	--	--	< RL	< RL	--	--
Butyl benzyl phthalate	--	--	260	--	--	--	--	< RL	< RL	--	--
3,3'-Dichlorobenzidine	--	--	1.1	--	--	--	--	< RL	< RL	--	--
Benzo(a)anthracene	--	47.7	0.15	--	--	--	--	< RL	< RL	--	--
Chrysene	--	4774	15	--	--	--	--	< RL	< RL	--	--
Bis(2-ethylhexyl) phthalate	--	--	35	--	--	--	--	< RL	1.1 J	--	--
Di-n-octyl phthalate	--	--	--	--	--	--	--	< RL	< RL	--	--
Benzo(b)fluoranthene	--	47.7	0.15	--	--	--	--	< RL	< RL	--	--
Benzo(k)fluoranthene	--	477	1.5	--	--	--	--	< RL	< RL	--	--
Benzo(a)pyrene	--	4.77	0.015	--	--	--	--	< RL	< RL	--	--
I< RLeno(1,2,3-cd)pyrene	--	47.7	0.15	--	--	--	--	< RL	< RL	--	--
Dibenz(a,h)anthracene		4.77	0.015	--	--	--	--	< RL	< RL	--	--
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	< RL	< RL	--	--

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PESTICIDES 8081A ug/kg											
alpha-BHC	--	--	0.077	--	--	--	--	< RL	< RL	--	--
beta-BHC	--	74.2	0.27	--	--	--	--	< RL	< RL	--	--
delta-BHC	--	--	--	--	--	--	--	< RL	< RL	--	--
gamma-BHC	--	--	0.52	--	--	--	--	< RL	< RL	--	--
Heptachlor	2981	29.8	0.11	--	--	--	--	< RL	< RL	--	--
Aldrin	179	7.88	0.029	--	--	--	--	< RL	< RL	--	--
Heptachlor epoxide	77.5	14.8	0.053	--	--	--	--	< RL	< RL	--	--
Endosulfan I	--	--	370	--	--	--	--	< RL	< RL	--	--
Dieldrin	298	8.39	0.030	--	--	--	--	< RL	< RL	--	--
4,4'-DDE	--	--	1.4	--	--	--	--	0.00073 J,PG	< RL	--	--
Endrin	330	--	18	--	--	--	--	< RL	< RL	--	--
Endosulfan II	--	--	--	--	--	--	--	< RL	< RL	--	--
4,4'-DDD	--	--	2.0	--	--	--	--	< RL	< RL	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	< RL	< RL	--	--
4,4'-DDT	--	--	1.7	--	--	--	--	< RL	< RL	--	--
Methoxychlor	--	--	310	--	--	--	--	< RL	< RL	--	--
Endrin ketone	--	--	--	--	--	--	--	< RL	< RL	--	--
Endrin aldehyde	--	--	--	--	--	--	--	< RL	< RL	--	--
alpha-Chlordane	--	--	--	--	--	--	--	< RL	< RL	--	--
gamma-Chlordane	--	--	1.6	--	--	--	--	< RL	< RL	--	--
Toxaphene	--	--	0.44	--	--	--	--	< RL	< RL	--	--
PCBs 8082 ug/kg											
Aroclor-1016	192	34.6	3.9	--	--	--	--	< RL	< RL	--	--
Aroclor-1221	--	--	0.14	--	--	--	--	< RL	< RL	--	--
Aroclor-1232	--	--	0.14	--	--	--	--	< RL	< RL	--	--
Aroclor-1242	--	--	0.22	--	--	--	--	< RL	< RL	--	--
Aroclor-1248	--	34.6	0.22	--	--	--	--	< RL	< RL	--	--
Aroclor-1254	54.9	34.6	0.22	--	--	--	--	< RL	< RL	--	--
Aroclor-1260	--	34.6	0.22	--	--	--	--	< RL	< RL	--	--

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ug/L = micrograms per liter (parts per billion)
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mg/kg = milligrams per kilogram (parts per million)
Organics:
RL - Reporting Limit
< RL = Indicates that the compound was analyzed for but not detected
J = Estimated result. Result is less than Reporting Limit
B = Method blank contamination. The associated method blank contains the target analyte at a reportable level.
PG - The percent difference between the original and confirmation analyses is greater than 40%
Highlighted = > Regional Screening Level
Bold = > Background
Italics = > Cleanup goals

Field Sampling Report

PIKA INTERNATIONAL, INC.

Project Name: RVAAP

Location ID: PCTss-001M-0001-SO

Ravenna Army Ammunition Plant
Ravenna Ohio

Date: 05/20/2011 Weather: Cloudy Temperature: 67

Sampling Information

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

Sample Collection: 1025 hrs Sample Type: Composite - (MI) - Grab Location: Plotted on Map - Staked in Field
If MI, # of increments taken: ____ 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:		VOC		TPH GRO		Corrosivity		
Background:	ppm	Nitrocellulose	X	TPH DRO		Reactivity Sulfide/Cyanide		
		Nitroguanidine	X	Chromium +6		Ignitability		
Sample:	ppm	Nitroglycerine	X	Nitrate				
Water Level	FT	Perchlorate	X	Sulfate		**QA Samples**		
Temperature	°C	Pesticides/PCBs		Asbestos		MS/MSD	Yes / No	NA
Sp. Conductance:	uMHOs	RVAAP Full Suite		Arsenic		Duplicate ID	(Yes) / No	NA
pH	units	TOC		Chromium		Equipment Rinse ID	Yes / No	NA
Turbidity	N.T.U.	Grain Size				Trip Blank ID	Yes / No	NA

Sample Description

COLOR: Brown ODOR: None
STAINING: None TEXTURE: Massive
SORTING: Poor PLACTICITY: None
MOISTURE: Moist

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: James King Jr (Please Print) Reviewed by: S[illegible] (Please Print)

Signature: [signature] Signature: [signature] Date: 6/16/11

Field Sampling Report

PIKA INTERNATIONAL, INC.

Project Name: RVAAP

Location ID: PCTss-002M-0001-SO

Ravenna Army Ammunition Plant
Ravenna Ohio

Date: 05/26/2011 Weather: Cloudy Temperature: 68

Sampling Information

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

Sample Collection: 1120 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:		VOC	X	SVOCs	X	Corrosivity			
Background:	ppm	Nitrocellulose	X	TAL Metal	X	Reactivity Sulfide/Cyanide			
		Nitroguanidine	X	Mercury	X	Ignitability			
Sample:	ppm	Nitroglycerine	X	Cyanide	X				
Water Level	FT	Perchlorate	X	Solids	X	**QA Samples**			
Temperature	°C	Pesticides/PCBs	X	Reactivity	X	MS/MSD	(Yes) No	NA	
Sp. Conductance:	uMHOs	Full TCLP	X	Flash Point	X	Duplicate ID	Yes / No	NA	
pH	units	PCB	X	PH	X	Equipment Rinse ID	Yes / No	NA	
Turbidity	N.T.U.	Explosives	X			Trip Blank ID	Yes / No	NA	

Sample Description

COLOR: Brown ODOR: None STAINING: None TEXTURE: massive SORTING: Poor PLACTICITY: None MOISTURE: moist

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: James King Jr (Please Print) Reviewed by: S. Catherine (Please Print)

Signature: [signature] Signature: [signature] Date: 6/14/11

Note: VOC's were taken as a discrete sample.

Field Sampling Report

PIKA INTERNATIONAL, INC.

Project Name: RVAAP

Location ID: PCTss-003M-0001-SO

Ravenna Army Ammunition Plant
Ravenna Ohio

Date: 05/26/2011 **Weather** Cloudy **Temperature** 71°

Sampling Information

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

Sample Collection: 1305 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)

PID / FID Readings:		
Background:	ppm	
Sample:	ppm	
Water Level	FT	
Temperature	°C	
Sp. Conductance:	uMHOs	
pH	units	
Turbidity	N.T.U.	

Analytical Parameters

VOC		TPH GRO	
Nitrocellulose	X	TPH DRO	
Nitroguanidine	X	Chromium +6	
Nitroglycerine	X	Nitrate	
Perchlorate	X	Sulfate	
Pesticides/PCBs		Asbestos	
RVAAP Full Suite		Arsenic	
TOC		Chromium	
Grain Size			

Other Parameters

Corrosivity			
Reactivity Sulfide/Cyanide			
Ignitability			

QA Samples

MS/MSD	Yes / No	NA
Duplicate ID	Yes / No	NA
Equipment Rinse ID	Yes / No	NA
Trip Blank ID	Yes / No	NA

Sample Description

COLOR: Brown ODOR: None
STAINING: None TEXTURE: Mostly SORTING: poor
PLACTICITY: None MOISTURE: moist

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: James King Jr (Please Print)

Signature: James L King Jr

Reviewed by: S Stapleton (Please Print)

Signature: _____ Date: 6/16/11

PIKA International, Inc.

Client Sample ID: PCTss-001M-0001-SO

General Chemistry

Lot-Sample #...: G1F030473-001 Work Order #...: MJ07E Matrix.....: SOLID
Date Sampled...: 05/26/11 Date Received..: 06/03/11
% Moisture.....:

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrocellulose	1.1 B	5.0	mg/kg	TAL-SOP WS-WC-005	06/15-06/16/11	1166054

Dilution Factor: 1

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

PIKA International, Inc.

Client Sample ID: PCTss-001M-0001-SO

HPLC

Lot-Sample #...:	G1F030473-001	Work Order #...:	MJ07E1AE	Matrix.....:	SOLID
Date Sampled...:	05/26/11	Date Received..:	06/03/11		
Prep Date.....:	06/08/11	Analysis Date..:	06/13/11		
Prep Batch #...:	1159146				
Dilution Factor:	0.97				
% Moisture.....:		Method.....:	SW846 8330 (Modif		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Nitroguanidine	0.063 J	0.24	mg/kg	0.019

NOTE(S):

J Estimated result. Result is less than RL

PIKA International, Inc.

Client Sample ID: PCTss-001M-0001-SO

HPLC

Lot-Sample #...: G1F030473-001	Work Order #...: MJ07E1AF		Matrix.....: SOLID	
Date Sampled...: 05/26/11	Date Received..: 06/03/11			
Prep Date.....: 06/08/11	Analysis Date..: 06/13/11			
Prep Batch #...: 1159133				
Dilution Factor: 0.96				
% Moisture.....:	Method.....: SW846 8330			

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Nitroglycerin	ND	0.48	mg/kg	0.12

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
3,4-Dinitrotoluene	92	(78 - 108)

Client: TestAmerica Laboratories, Inc.

Job Number: 280-16702-1
Sdg Number: G1F030473

Client Sample ID: PCTSS-001M-0001-SO

Lab Sample ID: 280-16702-1
Client Matrix: Solid

Date Sampled: 05/26/2011 1025
Date Received: 06/08/2011 0930

6860 Perchlorate by IC/MS or IC/MS/MS

Analysis Method:	6860	Analysis Batch:	280-72023	Instrument ID:	LC_LCMS1
Prep Method:	6860	Prep Batch:	280-71229	Lab File ID:	IC11F15024.d
Dilution:	1.0			Initial Weight/Volume:	10.58 g
Analysis Date:	06/15/2011 1857			Final Weight/Volume:	100 mL
Prep Date:	06/09/2011 1658			Injection Volume:	250 uL

Analyte	DryWt Corrected: N	Result (ug/Kg)	Qualifier	MDL	RL
Perchlorate		0.093	J	0.038	0.47

PIKA International, Inc.

Client Sample ID: PCTss-001M-0001-DUP

General Chemistry

Lot-Sample #...: G1F030473-002 Work Order #...: MJ07K Matrix.....: SOLID
Date Sampled...: 05/26/11 Date Received..: 06/03/11
% Moisture.....:

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrocellulose	0.82 B	5.0	mg/kg	TAL-SOP WS-WC-005	06/15-06/16/11	1166054

Dilution Factor: 1 MDL.....: 0.78

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

PIKA International, Inc.

Client Sample ID: PCTss-001M-0001-DUP

HPLC

Lot-Sample #...:	G1F030473-002	Work Order #...:	MJ07K1AF	Matrix.....:	SOLID
Date Sampled...:	05/26/11	Date Received..:	06/03/11		
Prep Date.....:	06/08/11	Analysis Date..:	06/13/11		
Prep Batch #...:	1159133				
Dilution Factor:	0.98				
% Moisture.....:		Method.....:	SW846 8330		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Nitroglycerin	ND	0.49	mg/kg	0.13

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
3,4-Dinitrotoluene	92	(78 - 108)

PIKA International, Inc.

Client Sample ID: PCTss-001M-0001-DUP

HPLC

Lot-Sample #...:	G1F030473-002	Work Order #...:	MJ07K1AE	Matrix.....:	SOLID
Date Sampled...:	05/26/11	Date Received..:	06/03/11		
Prep Date.....:	06/08/11	Analysis Date..:	06/13/11		
Prep Batch #...:	1159146				
Dilution Factor:	0.97				
% Moisture.....:		Method.....:	SW846 8330 (Modif		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Nitroguanidine	0.12 J	0.24	mg/kg	0.019

NOTE(S):

J Estimated result. Result is less than RL.

Client: TestAmerica Laboratories, Inc.

Job Number: 280-16702-1
Sdg Number: G1F030473

Client Sample ID: **PCTSS-001M-0001-DUP**

Lab Sample ID: 280-16702-2FD
Client Matrix: Solid

Date Sampled: 05/26/2011 1025
Date Received: 06/08/2011 0930

6860 Perchlorate by IC/MS or IC/MS/MS

Analysis Method:	6860	Analysis Batch:	280-72023	Instrument ID:	LC_LCMS1
Prep Method:	6860	Prep Batch:	280-71229	Lab File ID:	IC11F15025.d
Dilution:	1.0			Initial Weight/Volume:	10.29 g
Analysis Date:	06/15/2011 1925			Final Weight/Volume:	100 mL
Prep Date:	06/09/2011 1658			Injection Volume:	250 uL

Analyte	DryWt Corrected: N	Result (ug/Kg)	Qualifier	MDL	RL
Perchlorate		0.11	J	0.039	0.49

PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-SO

HPLC

Lot-Sample #...: G1F030473-004	Work Order #...: MJ07R1A9	Matrix.....: SOLID	
Date Sampled...: 05/26/11	Date Received..: 06/03/11		
Prep Date.....: 06/08/11	Analysis Date..: 06/13/11		
Prep Batch #...: 1159133			
Dilution Factor: 0.95			
% Moisture.....: 5.1	Method.....: SW846 8330		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
1,3,5-Trinitrobenzene	ND	0.24	mg/kg	0.019
1,3-Dinitrobenzene	ND	0.24	mg/kg	0.048
2,4,6-Trinitrotoluene	ND	0.24	mg/kg	0.019
2,4-Dinitrotoluene	ND	0.24	mg/kg	0.019
2,6-Dinitrotoluene	ND	0.24	mg/kg	0.028
2-Amino-4,6-dinitrotoluene	ND	0.24	mg/kg	0.095
2-Nitrotoluene	ND	0.24	mg/kg	0.076
3-Nitrotoluene	ND	0.24	mg/kg	0.066
4-Amino-2,6-dinitrotoluene	ND	0.24	mg/kg	0.019
4-Nitrotoluene	ND	0.24	mg/kg	0.076
HMX	ND	0.24	mg/kg	0.028
Nitrobenzene	ND	0.24	mg/kg	0.048
Nitroglycerin	ND	0.48	mg/kg	0.12
PETN	ND	0.48	mg/kg	0.15
RDX	ND	0.24	mg/kg	0.038
Tetryl	ND	0.24	mg/kg	0.048

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
3,4-Dinitrotoluene	90	(78 - 108)

PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-SO

HPLC

Lot-Sample #...:	G1F030473-004	Work Order #...:	MJ07R1A8	Matrix.....:	SOLID
Date Sampled...:	05/26/11	Date Received..:	06/03/11		
Prep Date.....:	06/08/11	Analysis Date..:	06/13/11		
Prep Batch #...:	1159146				
Dilution Factor:	1				
% Moisture.....:	5.1	Method.....:	SW846 8330 (Modif		

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

PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-SO

General Chemistry

Lot-Sample #...: G1F030473-004 Work Order #...: MJ07R Matrix.....: SOLID
Date Sampled...: 05/26/11 Date Received..: 06/03/11
% Moisture.....: 5.1

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	0.19 B	0.53	mg/kg	SW846 9012A	06/08-06/09/11	1160026
		Dilution Factor: 1		MDL.....: 0.11		
Nitrocellulose	ND	5.0	mg/kg	TAL-SOP WS-WC-005	06/15-06/16/11	1166054
		Dilution Factor: 1		MDL.....: 0.78		
Percent Moisture	5.1	0.10	%	ASTM D 2216-90	06/15-06/16/11	1166183
		Dilution Factor: 1		MDL.....: 0.10		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

Client: TestAmerica Laboratories, Inc.

Job Number: 280-16702-1
Sdg Number: G1F030473

Client Sample ID: PCTSS-002M-0001-SO

Lab Sample ID: 280-16702-3
Client Matrix: Solid

Date Sampled: 05/26/2011 1120
Date Received: 06/08/2011 0930

6860 Perchlorate by IC/MS or IC/MS/MS

Analysis Method:	6860	Analysis Batch:	280-72023	Instrument ID:	LC_LCMS1
Prep Method:	6860	Prep Batch:	280-71229	Lab File ID:	IC11F15026.d
Dilution:	1.0			Initial Weight/Volume:	10.02 g
Analysis Date:	06/15/2011 1954			Final Weight/Volume:	100 mL
Prep Date:	06/09/2011 1658			Injection Volume:	250 uL

Analyte	DryWt Corrected: N	Result (ug/Kg)	Qualifier	MDL	RL
Perchlorate		ND		0.040	0.50

PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-SO

TOTAL Metals

Lot-Sample #...: G1F030473-004 Matrix.....: SOLID
Date Sampled...: 05/26/11 Date Received..: 06/03/11
% Moisture.....: 5.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 1161109						
Silver	ND	0.53	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AC
		Dilution Factor: 1		MDL.....: 0.095		
Aluminum	10600	22.1	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AD
		Dilution Factor: 1		MDL.....: 5.9		
Arsenic	8.4	2.2	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AE
		Dilution Factor: 1		MDL.....: 1.4		
Barium	81.7	2.1	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AF
		Dilution Factor: 1		MDL.....: 0.13		
Beryllium	0.45	0.32	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AG
		Dilution Factor: 1		MDL.....: 0.032		
Calcium	954	105	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AH
		Dilution Factor: 1		MDL.....: 4.7		
Cadmium	0.13 B	0.32	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AJ
		Dilution Factor: 1		MDL.....: 0.032		
Cobalt	7.7	0.63	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AK
		Dilution Factor: 1		MDL.....: 0.26		
Chromium	14.5	1.3	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AL
		Dilution Factor: 1		MDL.....: 0.15		
Copper	12.1	2.6	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AM
		Dilution Factor: 1		MDL.....: 0.23		
Iron	17600	10.5	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AN
		Dilution Factor: 1		MDL.....: 1.2		
Potassium	654	105	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AP
		Dilution Factor: 1		MDL.....: 10.5		
Magnesium	1770	52.7	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AQ
		Dilution Factor: 1		MDL.....: 4.7		
Manganese	833	1.3	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AR
		Dilution Factor: 1		MDL.....: 0.26		

(Continued on next page)

PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-SO

TOTAL Metals

Lot-Sample #...: G1F030473-004 Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Sodium	35.6 B	527	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AT
		Dilution Factor: 1		MDL.....: 11.6		
Nickel	18.5	1.1	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AU
		Dilution Factor: 1		MDL.....: 0.25		
Lead	34.1	2.1	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AV
		Dilution Factor: 1		MDL.....: 0.27		
Antimony	ND	1.6	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AW
		Dilution Factor: 1		MDL.....: 0.99		
Selenium	ND	2.1	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1AX
		Dilution Factor: 1		MDL.....: 1.5		
Thallium	ND	2.1	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1A0
		Dilution Factor: 1		MDL.....: 0.89		
Vanadium	24.4	1.1	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1A1
		Dilution Factor: 1		MDL.....: 0.20		
Zinc	62.4	3.2	mg/kg	SW846 6010B	06/10-06/14/11	MJ07R1A2
		Dilution Factor: 1		MDL.....: 0.20		
Prep Batch #...: 1165205						
Mercury	0.049	0.040	mg/kg	SW846 7471A	06/14/11	MJ07R1CC
		Dilution Factor: 1		MDL.....: 0.0086		

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL

PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-SO

GC/MS Semivolatiles

Lot-Sample #...: G1F030473-004 Work Order #...: MJ07R1A4 Matrix.....: SOLID
Date Sampled...: 05/26/11 Date Received..: 06/03/11
Prep Date.....: 06/09/11 Analysis Date..: 06/20/11
Prep Batch #...: 1160142
Dilution Factor: 0.99
% Moisture.....: 5.1 Method.....: SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acenaphthene	ND	0.99	mg/kg	0.082
Acenaphthylene	ND	0.99	mg/kg	0.084
Anthracene	ND	0.99	mg/kg	0.085
Benzo(a)anthracene	ND	0.99	mg/kg	0.091
Benzo(b)fluoranthene	ND	0.99	mg/kg	0.094
Benzo(k)fluoranthene	ND	0.99	mg/kg	0.11
Benzo(ghi)perylene	ND	0.99	mg/kg	0.11
Benzo(a)pyrene	ND	0.99	mg/kg	0.093
bis(2-Chloroethoxy) methane	ND	0.99	mg/kg	0.087
bis(2-Chloroethyl)-ether	ND	0.99	mg/kg	0.080
bis(2-Ethylhexyl) phthalate	ND	5.0	mg/kg	0.097
4-Bromophenyl phenyl ether	ND	0.99	mg/kg	0.084
Butyl benzyl phthalate	ND	0.99	mg/kg	0.094
Carbazole	ND	0.99	mg/kg	0.094
4-Chloroaniline	ND	3.3	mg/kg	0.057
4-Chloro-3-methylphenol	ND	0.99	mg/kg	0.091
2-Chloronaphthalene	ND	0.99	mg/kg	0.080
2-Chlorophenol	ND	0.99	mg/kg	0.087
4-Chlorophenyl phenyl ether	ND	0.99	mg/kg	0.092
Chrysene	ND	0.99	mg/kg	0.083
Dibenzo(a,h)anthracene	ND	0.99	mg/kg	0.10
Dibenzofuran	ND	0.99	mg/kg	0.085
Di-n-butyl phthalate	ND	5.0	mg/kg	0.096
1,2-Dichlorobenzene	ND	3.3	mg/kg	0.074
1,3-Dichlorobenzene	ND	3.3	mg/kg	0.077
1,4-Dichlorobenzene	ND	3.3	mg/kg	0.076
3,3'-Dichlorobenzidine	ND	5.0	mg/kg	0.093
2,4-Dichlorophenol	ND	3.3	mg/kg	0.088
Diethyl phthalate	ND	0.99	mg/kg	0.089
2,4-Dimethylphenol	ND	0.99	mg/kg	0.17
Dimethyl phthalate	ND	0.99	mg/kg	0.086
4,6-Dinitro-2-methylphenol	0.14 J	2.0	mg/kg	0.080

(Continued on next page)

PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-SO

GC/MS Semivolatiles

Lot-Sample #...: G1F030473-004 Work Order #...: MJ07R1A4 Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
2,4-Dinitrophenol	ND	16	mg/kg	0.21
2,4-Dinitrotoluene	ND	0.99	mg/kg	0.088
2,6-Dinitrotoluene	ND	3.3	mg/kg	0.098
Di-n-octyl phthalate	ND	0.99	mg/kg	0.096
Fluoranthene	ND	0.99	mg/kg	0.094
Fluorene	ND	0.99	mg/kg	0.091
Hexachlorobenzene	ND	0.99	mg/kg	0.088
Hexachlorobutadiene	ND	5.0	mg/kg	0.081
Hexachlorocyclopenta-diene	ND	16	mg/kg	0.061
Hexachloroethane	ND	3.3	mg/kg	0.080
Indeno(1,2,3-cd)pyrene	ND	0.99	mg/kg	0.095
Isophorone	ND	5.0	mg/kg	0.092
2-Methylnaphthalene	ND	2.0	mg/kg	0.084
2-Methylphenol	ND	2.0	mg/kg	0.057
4-Methylphenol	ND	0.99	mg/kg	0.15
Naphthalene	ND	0.99	mg/kg	0.081
2-Nitroaniline	ND	16	mg/kg	0.083
3-Nitroaniline	ND	16	mg/kg	0.17
4-Nitroaniline	ND	16	mg/kg	0.087
Nitrobenzene	ND	0.99	mg/kg	0.075
2-Nitrophenol	ND	0.99	mg/kg	0.081
4-Nitrophenol	ND	16	mg/kg	0.28
N-Nitrosodiphenylamine	ND	3.3	mg/kg	0.085
N-Nitrosodi-n-propyl-amine	ND	0.99	mg/kg	0.083
2,2'-oxybis (1-Chloropropane)	ND	2.0	mg/kg	0.078
Pentachlorophenol	ND	16	mg/kg	0.050
Phenanthrene	ND	0.99	mg/kg	0.093
Phenol	ND	0.99	mg/kg	0.082
Pyrene	ND	0.99	mg/kg	0.093
1,2,4-Trichloro-benzene	ND	2.0	mg/kg	0.082
2,4,5-Trichloro-phenol	ND	2.0	mg/kg	0.082
2,4,6-Trichloro-phenol	ND	0.99	mg/kg	0.083

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PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-SO

GC/MS Semivolatiles

Lot-Sample #...: G1F030473-004 Work Order #...: MJ07R1A4 Matrix.....: SOLID

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2-Fluorobiphenyl	72	(65 - 135)
2-Fluorophenol	68	(65 - 135)
Nitrobenzene-d5	62 *	(65 - 135)
Phenol-d5	74	(65 - 135)
Terphenyl-d14	81	(65 - 135)
2,4,6-Tribromophenol	77	(65 - 135)

NOTE(S):

* Surrogate recovery is outside stated control limits.

J Estimated result. Result is less than RL.

PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-SO

GC Semivolatiles

Lot-Sample #...:	G1F030473-004	Work Order #...:	MJ07R1CA	Matrix.....:	SOLID
Date Sampled...:	05/26/11	Date Received..:	06/03/11		
Prep Date.....:	06/09/11	Analysis Date..:	06/22/11		
Prep Batch #...:	1160137				
Dilution Factor:	0.99				
% Moisture.....:	5.1	Method.....:	SW846 8081A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
alpha-BHC	ND	1.7	ug/kg	0.22
gamma-BHC (Lindane)	ND	1.7	ug/kg	0.17
Heptachlor	ND	1.7	ug/kg	0.19
Aldrin	ND	1.7	ug/kg	0.21
beta-BHC	ND	1.7	ug/kg	0.33
delta-BHC	ND	1.7	ug/kg	0.16
Heptachlor epoxide	ND	1.7	ug/kg	0.12
Endosulfan I	ND	1.7	ug/kg	0.051
gamma-Chlordane	ND	1.7	ug/kg	0.052
alpha-Chlordane	ND	1.7	ug/kg	0.20
4,4'-DDE	0.73 J,PG	3.4	ug/kg	0.22
Dieldrin	ND	3.4	ug/kg	0.090
Endrin	ND	3.4	ug/kg	0.11
4,4'-DDD	ND	3.4	ug/kg	0.26
Endosulfan II	ND	3.4	ug/kg	0.099
4,4'-DDT	ND	3.4	ug/kg	0.40
Endrin aldehyde	ND	3.4	ug/kg	0.11
Methoxychlor	ND	17	ug/kg	1.3
Endosulfan sulfate	ND	3.4	ug/kg	0.091
Endrin ketone	ND	3.4	ug/kg	0.34
Toxaphene	ND	66	ug/kg	20

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Decachlorobiphenyl	85	(50 - 150)
Tetrachloro-m-xylene	85	(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: PCTss-002M-0001-SO

GC Semivolatiles

Lot-Sample #...:	G1F030473-004	Work Order #...:	MJ07R1A5	Matrix.....: SOLID
Date Sampled...:	05/26/11	Date Received..:	06/03/11	
Prep Date.....:	06/09/11	Analysis Date..:	06/15/11	
Prep Batch #...:	1160138			
Dilution Factor:	0.99			
% Moisture.....:	5.1	Method.....:	SW846 8082	

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Aroclor 1016	ND	33	ug/kg	8.2
Aroclor 1221	ND	66	ug/kg	11
Aroclor 1232	ND	33	ug/kg	8.2
Aroclor 1242	ND	33	ug/kg	8.2
Aroclor 1248	ND	33	ug/kg	8.2
Aroclor 1254	ND	33	ug/kg	8.2
Aroclor 1260	ND	33	ug/kg	8.2

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Decachlorobiphenyl	95	(65 - 135)
Tetrachloro-m-xylene	88	(65 - 135)

PIKA International, Inc.

Client Sample ID: PCTss-002D-0001-SO

GC/MS Volatiles

Lot-Sample #...: G1F030473-003 Work Order #...: MJ07L1AC Matrix.....: SOLID
Date Sampled...: 05/26/11 Date Received..: 06/03/11
Prep Date.....: 06/07/11 Analysis Date..: 06/07/11
Prep Batch #...: 1159051
Dilution Factor: 1
% Moisture.....: 24 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Methylene chloride	ND	5.0	ug/kg	0.84
4-Methyl-2-pentanone (MIBK)	ND	10	ug/kg	0.92
Styrene	ND	5.0	ug/kg	0.31
1,1,2,2-Tetrachloroethane	ND	5.0	ug/kg	0.68
Tetrachloroethene	ND	5.0	ug/kg	0.61
Toluene	ND	5.0	ug/kg	0.61
1,1,1-Trichloroethane	ND	5.0	ug/kg	0.36
1,1,2-Trichloroethane	ND	5.0	ug/kg	0.44
Trichloroethene	ND	5.0	ug/kg	0.60
Vinyl chloride	ND	5.0	ug/kg	0.36
Xylenes (total)	ND	5.0	ug/kg	0.81
Acetone	5.3 J,B	10	ug/kg	1.4
Benzene	ND	5.0	ug/kg	0.26
Bromodichloromethane	ND	5.0	ug/kg	0.53
Bromoform	ND	5.0	ug/kg	0.40
Bromomethane	ND	5.0	ug/kg	0.86
2-Butanone (MEK)	ND	10	ug/kg	1.4
Carbon disulfide	ND	5.0	ug/kg	0.49
Carbon tetrachloride	ND	5.0	ug/kg	0.53
Chlorobenzene	ND	5.0	ug/kg	0.29
Dibromochloromethane	ND	5.0	ug/kg	0.21
Chloroethane	ND	5.0	ug/kg	0.45
Chloroform	ND	5.0	ug/kg	0.26
Chloromethane	ND	10	ug/kg	0.50
1,1-Dichloroethane	ND	5.0	ug/kg	0.29
1,2-Dichloroethane	ND	5.0	ug/kg	0.73
1,1-Dichloroethene	ND	5.0	ug/kg	0.26
1,2-Dichloroethene (total)	ND	5.0	ug/kg	0.64
1,2-Dichloropropane	ND	5.0	ug/kg	0.60
cis-1,3-Dichloropropene	ND	5.0	ug/kg	0.64
trans-1,3-Dichloropropene	ND	5.0	ug/kg	0.75
Ethylbenzene	ND	5.0	ug/kg	0.34
2-Hexanone	ND	10	ug/kg	0.74

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	92	(65 - 135)
1,2-Dichloroethane-d4	98	(65 - 135)
Toluene-d8	104	(65 - 135)

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PIKA International, Inc.

Client Sample ID: PCTss-002D-0001-SO

GC/MS Volatiles

Lot-Sample #...: G1F030473-003 Work Order #...: MJ07L1AC Matrix.....: SOLID

NOTE(S):

J Estimated result Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-ER

HPLC

Lot-Sample #...: G1F030473-005	Work Order #...: MJ0701AC	Matrix.....: WATER	
Date Sampled...: 05/26/11	Date Received..: 06/03/11		
Prep Date.....: 06/06/11	Analysis Date..: 06/09/11		
Prep Batch #...: 1157073			
Dilution Factor: 1.04	Method.....: SW846 8330		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Nitroglycerin	ND	0.68	ug/L	0.34
PETN	ND	0.68	ug/L	0.31
2-Amino-4,6-dinitrotoluene	ND	0.10	ug/L	0.10
4-Amino-2,6-dinitrotoluene	ND	0.10	ug/L	0.052
1,3-Dinitrobenzene	ND	0.10	ug/L	0.052
2,4-Dinitrotoluene	ND	0.10	ug/L	0.052
2,6-Dinitrotoluene	ND	0.10	ug/L	0.052
HMX	ND	0.10	ug/L	0.037
Nitrobenzene	ND	0.10	ug/L	0.052
2-Nitrotoluene	ND	0.52	ug/L	0.092
3-Nitrotoluene	ND	0.52	ug/L	0.059
4-Nitrotoluene	ND	0.52	ug/L	0.092
RDX	ND	0.10	ug/L	0.037
Tetryl	ND	0.10	ug/L	0.052
1,3,5-Trinitrobenzene	ND	0.10	ug/L	0.031
2,4,6-Trinitrotoluene	ND	0.10	ug/L	0.052

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
3,4-Dinitrotoluene	82	(79 - 111)

PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-ER

Dissolved HPLC

Lot-Sample #...:	G1F030473-005	Work Order #...:	MJ0701AE
Date Sampled...:	05/26/11	Date Received..:	06/03/11
Prep Date.....:	06/09/11	Analysis Date..:	06/13/11
Prep Batch #...:	1160065		
Dilution Factor:	1	Method.....:	SW846 8330 (Modif

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Nitroguanidine	ND	20	ug/L	2.4

PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-ER

General Chemistry

Lot-Sample #...: G1F030473-005 Work Order #...: MJ070 Matrix.....: WATER
Date Sampled...: 05/26/11 Date Received..: 06/03/11

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	ND	0.010	mg/L	SW846 9012A	06/08-06/09/11	1160025
		Dilution Factor: 1		MDL.....: 0.0050		
Nitrocellulose	ND	2.0	mg/L	TAL-SOP WS-WC-005	06/09-06/10/11	1160040
		Dilution Factor: 1		MDL.....: 0.48		

Client: TestAmerica Laboratories, Inc.

Job Number: 280-16702-1
Sdg Number: G1F030473

Client Sample ID: **PCTSS-002M-0001-ER**

Lab Sample ID: 280-16702-4
Client Matrix: Water

Date Sampled: 05/26/2011 0840
Date Received: 06/08/2011 0930

6860 Perchlorate by IC/MS or IC/MS/MS

Analysis Method:	6860	Analysis Batch:	280-72016	Instrument ID:	LC_LCMS1
	N/A	Prep Batch:	N/A	Lab File ID:	IC11F15017.d
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	06/15/2011 1538			Final Weight/Volume:	1.0 mL
Prep Date:	N/A			Injection Volume:	250 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Perchlorate	ND		0.0088	0.050

PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-ER

TOTAL Metals

Lot-Sample #...: G1F030473-005 Matrix.....: WATER
Date Sampled...: 05/26/11 Date Received..: 06/03/11

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 1160035						
Silver	ND	5.0	ug/L	SW846 6010B	06/09/11	MJ0701AH
		Dilution Factor: 1		MDL.....: 0.84		
Aluminum	ND	200	ug/L	SW846 6010B	06/09/11	MJ0701AJ
		Dilution Factor: 1		MDL.....: 48.0		
Arsenic	ND	21.0	ug/L	SW846 6010B	06/09/11	MJ0701AK
		Dilution Factor: 1		MDL.....: 12.0		
Barium	ND	21.0	ug/L	SW846 6010B	06/09/11	MJ0701AL
		Dilution Factor: 1		MDL.....: 2.5		
Beryllium	ND	3.0	ug/L	SW846 6010B	06/09/11	MJ0701AM
		Dilution Factor: 1		MDL.....: 0.30		
Cadmium	ND	1000	ug/L	SW846 6010B	06/09/11	MJ0701AN
		Dilution Factor: 1		MDL.....: 0.50		
Cobalt	ND	6.0	ug/L	SW846 6010B	06/09/11	MJ0701AP
		Dilution Factor: 1		MDL.....: 3.0		
Chromium	ND	12.0	ug/L	SW846 6010B	06/09/11	MJ0701AQ
		Dilution Factor: 1		MDL.....: 1.2		
Copper	ND	20.0	ug/L	SW846 6010B	06/09/11	MJ0701AR
		Dilution Factor: 1		MDL.....: 2.1		
Iron	ND	100	ug/L	SW846 6010B	06/09/11	MJ0701AT
		Dilution Factor: 1		MDL.....: 20.0		
Potassium	ND	1000	ug/L	SW846 6010B	06/09/11	MJ0701AU
		Dilution Factor: 1		MDL.....: 93.0		
Magnesium	ND	500	ug/L	SW846 6010B	06/09/11	MJ0701AV
		Dilution Factor: 1		MDL.....: 40.0		
Manganese	ND	12.0	ug/L	SW846 6010B	06/09/11	MJ0701AW
		Dilution Factor: 1		MDL.....: 2.5		
Sodium	ND	1000	ug/L	SW846 6010B	06/09/11	MJ0701AX
		Dilution Factor: 1		MDL.....: 250		

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PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-ER

TOTAL Metals

Lot-Sample #...: G1F030473-005 Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Nickel	ND	50.0	ug/L	SW846 6010B	06/09/11	MJ0701A0
		Dilution Factor: 1		MDL.....: 2.4		
Lead	ND	10.0	ug/L	SW846 6010B	06/09/11	MJ0701A1
		Dilution Factor: 1		MDL.....: 2.5		
Antimony	ND	60.0	ug/L	SW846 6010B	06/09/11	MJ0701A2
		Dilution Factor: 1		MDL.....: 9.8		
Selenium	20.6 B	25.0	ug/L	SW846 6010B	06/09/11	MJ0701A3
		Dilution Factor: 1		MDL.....: 13.0		
Thallium	ND	15.0	ug/L	SW846 6010B	06/09/11	MJ0701A4
		Dilution Factor: 1		MDL.....: 9.0		
Vanadium	ND	5.0	ug/L	SW846 6010B	06/09/11	MJ0701A5
		Dilution Factor: 1		MDL.....: 1.9		
Zinc	ND	20.0	ug/L	SW846 6010B	06/09/11	MJ0701A6
		Dilution Factor: 1		MDL.....: 3.0		
Prep Batch #...: 1167094						
Mercury	ND	0.00020	mg/L	SW846 7470A	06/15-06/16/11	MJ0701A7
		Dilution Factor: 1		MDL.....: 0.00010		

NOTE(S):

B Estimated result. Result is less than RL.

PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-ER

GC/MS Semivolatiles

Lot-Sample #...: G1F030473-005 Work Order #...: MJ0701AF Matrix.....: WATER
Date Sampled...: 05/26/11 Date Received..: 06/03/11
Prep Date.....: 06/07/11 Analysis Date..: 06/20/11
Prep Batch #...: 1158062
Dilution Factor: 0.95 Method.....: SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acenaphthene	ND	9.5	ug/L	1.0
Acenaphthylene	ND	9.5	ug/L	1.0
Anthracene	ND	9.5	ug/L	0.95
Benzo(a)anthracene	ND	9.5	ug/L	0.95
Benzo(b)fluoranthene	ND	9.5	ug/L	1.1
Benzo(k)fluoranthene	ND	9.5	ug/L	0.91
Benzo(ghi)perylene	ND	9.5	ug/L	1.3
Benzo(a)pyrene	ND	9.5	ug/L	0.65
bis(2-Chloroethoxy) methane	ND	9.5	ug/L	0.95
bis(2-Chloroethyl)-ether	ND	19	ug/L	1.4
bis(2-Ethylhexyl) phthalate	1.1 J	24	ug/L	0.95
4-Bromophenyl phenyl ether	ND	9.5	ug/L	1.0
Butyl benzyl phthalate	ND	9.5	ug/L	1.3
4-Chloroaniline	ND	9.5	ug/L	1.9
4-Chloro-3-methylphenol	ND	9.5	ug/L	1.9
2-Chloronaphthalene	ND	9.5	ug/L	1.2
2-Chlorophenol	ND	9.5	ug/L	1.5
4-Chlorophenyl phenyl ether	ND	9.5	ug/L	1.0
Chrysene	ND	9.5	ug/L	0.58
Dibenzofuran	ND	9.5	ug/L	1.0
Di-n-butyl phthalate	ND	24	ug/L	1.0
1,2-Dichlorobenzene	ND	9.5	ug/L	1.4
1,3-Dichlorobenzene	ND	9.5	ug/L	1.4
1,4-Dichlorobenzene	ND	9.5	ug/L	1.3
3,3'-Dichlorobenzidine	ND	48	ug/L	0.91
2,4-Dichlorophenol	ND	9.5	ug/L	2.5
Diethyl phthalate	ND	9.5	ug/L	0.88
2,4-Dimethylphenol	ND	9.5	ug/L	2.1
Dimethyl phthalate	ND	9.5	ug/L	0.84
Di-n-octyl phthalate	ND	9.5	ug/L	1.4
4,6-Dinitro-2-methylphenol	ND	48	ug/L	2.1
2,4-Dinitrophenol	ND	48	ug/L	19
2,4-Dinitrotoluene	ND	9.5	ug/L	1.9

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PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-ER

GC/MS Semivolatiles

Lot-Sample #...: G1F030473-005 Work Order #...: MJ0701AF Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
2,6-Dinitrotoluene	ND	9.5	ug/L	1.9
Fluoranthene	ND	9.5	ug/L	0.62
Fluorene	ND	9.5	ug/L	0.88
Hexachlorobenzene	ND	9.5	ug/L	1.3
Hexachlorobutadiene	ND	24	ug/L	1.2
Hexachlorocyclopenta-diene	ND	48	ug/L	4.8
Hexachloroethane	ND	9.5	ug/L	1.3
Indeno(1,2,3-cd)pyrene	ND	9.5	ug/L	3.2
Isophorone	ND	24	ug/L	0.95
2-Methylnaphthalene	ND	9.5	ug/L	1.4
2-Methylphenol	ND	9.5	ug/L	0.88
4-Methylphenol	ND	9.5	ug/L	3.3
Naphthalene	ND	9.5	ug/L	1.2
2-Nitroaniline	ND	48	ug/L	1.9
3-Nitroaniline	ND	48	ug/L	1.3
4-Nitroaniline	ND	48	ug/L	1.4
Nitrobenzene	ND	9.5	ug/L	1.5
2-Nitrophenol	ND	9.5	ug/L	1.8
4-Nitrophenol	ND	48	ug/L	5.8
N-Nitrosodi-n-propyl-amine	ND	9.5	ug/L	1.3
N-Nitrosodiphenylamine	ND	9.5	ug/L	0.51
Pentachlorophenol	ND	9.5	ug/L	1.9
Phenanthrene	ND	48	ug/L	0.95
Phenol	ND	9.5	ug/L	1.0
Pyrene	ND	9.5	ug/L	1.3
1,2,4-Trichloro-benzene	ND	9.5	ug/L	1.3
2,4,5-Trichloro-phenol	ND	48	ug/L	1.9
2,4,6-Trichloro-phenol	ND	9.5	ug/L	1.9
Dibenzo(a,h)anthracene	ND	9.5	ug/L	1.9
Carbazole	ND	9.5	ug/L	1.1
2,2'-oxybis (1-Chloropropane)	ND	19	ug/L	1.2

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2-Fluorobiphenyl	70	(50 - 150)
2-Fluorophenol	48 *	(50 - 150)
Nitrobenzene-d5	78	(50 - 150)
Phenol-d5	30 *	(50 - 150)
Terphenyl-d14	98	(50 - 150)
2,4,6-Tribromophenol	80	(50 - 150)

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PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-ER

GC/MS Semivolatiles

Lot-Sample #...: G1F030473-005 Work Order #...: MJ0701AF Matrix.....: WATER

NOTE(S):

* Surrogate recovery is outside stated control limits.

J Estimated result. Result is less than RL.

PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-ER

GC Semivolatiles

Lot-Sample #...: G1F030473-005 Work Order #...: MJ0701A8 Matrix.....: WATER
Date Sampled...: 05/26/11 Date Received..: 06/03/11
Prep Date.....: 06/07/11 Analysis Date..: 06/22/11
Prep Batch #...: 1158058
Dilution Factor: 0.97 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
alpha-BHC	ND	0.048	ug/L	0.0057
gamma-BHC (Lindane)	ND	0.048	ug/L	0.0048
Heptachlor	ND	0.048	ug/L	0.0055
Aldrin	ND	0.048	ug/L	0.0048
beta-BHC	ND	0.048	ug/L	0.0046
delta-BHC	ND	0.048	ug/L	0.0028
Heptachlor epoxide	ND	0.048	ug/L	0.0020
Endosulfan I	ND	0.048	ug/L	0.0042
gamma-Chlordane	ND	0.048	ug/L	0.0027
alpha-Chlordane	ND	0.048	ug/L	0.0026
4,4'-DDE	ND	0.097	ug/L	0.0059
Dieldrin	ND	0.097	ug/L	0.0049
Endrin	ND	0.097	ug/L	0.0052
4,4'-DDD	ND	0.097	ug/L	0.0039
Endosulfan II	ND	0.097	ug/L	0.0030
4,4'-DDT	ND	0.097	ug/L	0.0049
Endrin aldehyde	ND	0.097	ug/L	0.0041
Methoxychlor	ND	1.9	ug/L	0.026
Endosulfan sulfate	ND	0.097	ug/L	0.0041
Endrin ketone	ND	0.097	ug/L	0.0031
Toxaphene	ND	1.9	ug/L	0.49

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Decachlorobiphenyl	66	(50 - 150)
Tetrachloro-m-xylene	77	(50 - 150)

PIKA International, Inc.

Client Sample ID: PCTss-002M-0001-ER

GC Semivolatiles

Lot-Sample #...: G1F030473-005 Work Order #...: MJ0701AG Matrix.....: WATER
Date Sampled...: 05/26/11 Date Received..: 06/03/11
Prep Date.....: 06/07/11 Analysis Date..: 06/12/11
Prep Batch #...: 1158061
Dilution Factor: 0.97 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Aroclor 1016	ND	0.97	ug/L	0.26
Aroclor 1221	ND	1.9	ug/L	0.34
Aroclor 1232	ND	0.97	ug/L	0.13
Aroclor 1242	ND	0.97	ug/L	0.19
Aroclor 1248	ND	0.97	ug/L	0.11
Aroclor 1254	ND	0.97	ug/L	0.31
Aroclor 1260	ND	0.97	ug/L	0.24

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Decachlorobiphenyl	66	(65 - 135)
Tetrachloro-m-xylene	87	(65 - 135)

PIKA International, Inc.

Client Sample ID: PCTss-003M-0001-SO

HPLC

Lot-Sample #...:	G1F030473-006	Work Order #...:	MJ0711AF	Matrix.....:	SOLID
Date Sampled...:	05/26/11	Date Received..:	06/03/11		
Prep Date.....:	06/08/11	Analysis Date..:	06/13/11		
Prep Batch #...:	1159133				
Dilution Factor:	0.99				
% Moisture.....:		Method.....:	SW846 8330		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Nitroglycerin	ND	0.50	mg/kg	0.13

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
3,4-Dinitrotoluene	92	(78 - 108)

PIKA International, Inc.

Client Sample ID: PCTss-003M-0001-SO

HPLC

Lot-Sample #...:	G1F030473-006	Work Order #...:	MJ0711AE	Matrix.....:	SOLID
Date Sampled...:	05/26/11	Date Received..:	06/03/11		
Prep Date.....:	06/08/11	Analysis Date..:	06/13/11		
Prep Batch #...:	1159146				
Dilution Factor:	1.02				
% Moisture.....:		Method.....:	SW846 8330 (Modif		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Nitroguanidine	0.17 J	0.26	mg/kg	0.020

NOTE(S):

J Estimated result. Result is less than RL.

PIKA International, Inc.

Client Sample ID: PCTss-003M-0001-SO

General Chemistry

Lot-Sample #...: G1F030473-006 Work Order #...: MJ071 Matrix.....: SOLID
Date Sampled...: 05/26/11 Date Received..: 06/03/11
% Moisture.....:

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrocellulose	ND	5.0	mg/kg	TAL-SOP WS-WC-005	06/15-06/16/11	1166054

Dilution Factor: 1 MDL.....: 0.78

Client: TestAmerica Laboratories, Inc.

Job Number: 280-16702-1
Sdg Number: G1F030473

Client Sample ID: **PCTSS-003M-0001-SO**

Lab Sample ID: 280-16702-5
Client Matrix: Solid

Date Sampled: 05/26/2011 1305
Date Received: 06/08/2011 0930

6860 Perchlorate by IC/MS or IC/MS/MS

Analysis Method:	6860	Analysis Batch:	280-72023	Instrument ID:	LC_LCMS1
Prep Method:	6860	Prep Batch:	280-71229	Lab File ID:	IC11F15029.d
Dilution:	1.0			Initial Weight/Volume:	10.70 g
Analysis Date:	06/15/2011 2119			Final Weight/Volume:	100 mL
Prep Date:	06/09/2011 1658			Injection Volume:	250 uL

Analyte	DryWt Corrected: N	Result (ug/Kg)	Qualifier	MDL	RL
Perchlorate		0.093	J	0.037	0.47

PIKA International, Inc.

Client Sample ID: TRIP BLANK

GC/MS Volatiles

Lot-Sample #...: G1F030473-007 Work Order #...: MJ0731AA Matrix.....: WATER
Date Sampled...: 05/26/11 Date Received..: 06/03/11
Prep Date.....: 06/08/11 Analysis Date..: 06/08/11
Prep Batch #...: 1160070
Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.19
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	ND	1.0	ug/L	0.13
Vinyl chloride	ND	1.0	ug/L	0.22
Xylenes (total)	ND	1.0	ug/L	0.18
Acetone	ND	10	ug/L	2.1
Benzene	ND	1.0	ug/L	0.13
Bromodichloromethane	ND	1.0	ug/L	0.14
Bromoform	ND	1.0	ug/L	0.10
Bromomethane	ND	1.0	ug/L	0.29
2-Butanone (MEK)	ND	10	ug/L	0.35
Carbon disulfide	ND	2.0	ug/L	0.16
Carbon tetrachloride	ND	1.0	ug/L	0.15
Chlorobenzene	ND	1.0	ug/L	0.12
Dibromochloromethane	ND	1.0	ug/L	0.13
Chloroethane	ND	2.0	ug/L	0.34
Chloroform	ND	1.0	ug/L	0.12
Chloromethane	ND	2.0	ug/L	0.25
1,1-Dichloroethane	ND	3.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
1,1-Dichloroethene	ND	1.0	ug/L	0.14
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.20
1,2-Dichloropropane	ND	1.0	ug/L	0.15
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.22
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.080
Ethylbenzene	ND	1.0	ug/L	0.10
2-Hexanone	ND	10	ug/L	0.17
Methylene chloride	ND	2.0	ug/L	0.35
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	0.18
Styrene	ND	1.0	ug/L	0.15
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.090
Tetrachloroethene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	95	(65 - 135)
1,2-Dichloroethane-d4	98	(65 - 135)
Toluene-d8	107	(65 - 135)

Appendix F

Water Removal Approval

You forwarded this message on 5/18/2010 7:48 AM.

Brian Stockwell

From: Eileen Mohr [eileen.mohr@epa.state.oh.us] **Sent:** Thu 4/15/2010 3:40 PM
To: Brian Stockwell
Cc: Eileen Mohr; Todd Fisher; mark.c.patterson@us.army.mil; Derek.S.Kinder@usace.army.mil; Glen.Beckham@usace.army.mil; Nathaniel.Peters.II@usace.army.mil
Subject: DB-802/Load Line 2
Attachments:

Brian

I have reviewed the data obtained from the URS sampling at the above area and the write-up prepared by USACE/URS. I also compared the sediment data that was obtained with the clean-up numbers presented in the approved Load Lines 1-4 ROD. In addition, I looked at the chromium data with respect to the 1:6 ratio that we have been using. With respect to arsenic in the surface water I looked at it from the perspective of the arsenic levels that at times are observed in the installation wells and local residential wells; coupled with the fact that the surface water samples were probably not filtered in the field. THe addition of acid as a presevative to a turbid sample could have increased metals concentrations.

All of that being said, approval is granted to discharge the surface water to the ground surface in the vicinity of DB-802 subject to the discharge conditions that have been established for RVAAP. As we discussed in the field today, I do not have an obection to a "sock fiilter" device over the end of the hose to ensure that solid particulates are not discharged. This device was used by another contractor on a different project at RVAAP.

Previously approvals have been granted with respect to the areas at Load Lines 2 and 3 that can be re-graded and the materials that can be used. All that is left is for the final selection of the water discharge location. As we discussed in the field, the area to the west of DB-802 may work out fine. Let me know when you want me to have a look at the area that is ultimately selected by PIKA.

That's it. Looks like you are good to go.

Thanks and have a good weekend.

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

Appendix-G

Data Validation

Data Validation Report For PIKA International, Inc.

Date: 9/16/11
Project: CC-RVAAP-80 Group 2 Propellant Can Tops
Project #: 10-08-130
Laboratory: Test America (Various)

Prepared By:

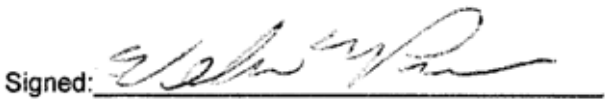
Signed: 
William W. Purves

Table of Contents

1.0 Introduction

This Data Validation Report (DVR) details the assessment and validation for samples collected by PIKA International and analytical data generated during field activities at the Ravenna Army Ammunition Plant, Ravenna Ohio, PIKA Project # 10-08-130. The laboratories subcontracted for the chemical analysis of the soil and water samples were Test America Sacramento, CA, North Canton, OH and Denver CO. The laboratories are United States Corps of engineers (USACE) approved to perform hazardous waste analysis.

This report is the accumulation of all of the laboratory reports/project numbers into one document. The samples evaluated in this report were sampled on May 26, 2011. The samples were taken by PIKA International personnel and picked up by Test America North Canton personnel on May 26, 2011. The samples were then distributed to Sacramento and Denver laboratories for analysis by North Canton. The Test America facilities that performed the tests are ELAP accredited facilities. The data validation is for methods listed below. Percent Solids was evaluated for completeness only. Analytical results of the samples are provided in tabular format in Appendix A that includes all qualifiers used and changed by the data validator. Appendix B contains all of the check lists that were used in the validation effort. The analysis performed included the following:

Volatile Organic Compounds via USEPA Method 8260B
Semi-Volatile Organic Compounds via USEPA Method 8270C
Pesticides via USEPA Method 8081A
Poly Chlorinated Biphenols via USEPA Method 8082
Explosives via USEPA Method 8330
Nitroglycerine via USEPA Method 8330
Nitroguanidine (propellant) via USEPA Method 8330 Modified
Perchlorate via USEPA Method 6860
Metals excluding Mercury via USEPA Methods 6010B and 6010B (trace)
Mercury by USEPA Methods 7470A (water) and 7471A (soil)
Nitrocellulose (propellant) via USEPA Methods 353.2
Cyanide via USEPA Method 9012A
Percent Solids via USEPA Method 160.3

Data validation of all sample results was performed by Purves Environmental. A review of 100% of the data was conducted. Ten percent (10%) of all QA/QC, 10% of the compounds in any particular list were evaluated and 10% of the sample data was reconstructed to verify data quality. The soils were checked separately from the equipment rinse.

Sample Distribution and Analysis Table

Laboratory	Project #	Sample Field IDs	Lab IDs	Analysis
Sacramento, Ca	G1F030473	PCTss-001M-0001-SO	MJ07E	Nitroglycerine Method 8330, Nitroquanidine Method 8330 Modified
Sacramento, Ca	G1F030473	PCTss-001M-0001-DUP	MJO7K	Nitroglycerine Method 8330, Nitroquanidine Method 8330 Modified
Sacramento, Ca	G1F030473	PCTss-002D-0001-SO	MJ07L	VOC Method 8260
Sacramento, Ca	G1F030473	PCTss-002M-0001-SO	MJ07R	Nitroglycerine Method 8330, Nitroquanidine Method 8330 Modified, Method 8270 SVOC, Method 8330 Explosives, Method 8081A Pesticides, Method 8082 PCBs, Method 6010B TAL Metals, Method 7471A Mercury
Sacramento, Ca	G1F030473	PCTss-002M-0001-ER	MJ070	Nitroglycerine Method 8330, Nitroquanidine Method 8330 Modified, Method 8270 SVOC, Method 8330 Explosives, Method 8081A Pesticides, Method 8082 PCBs, Method 6010B TAL Metals, Method 7470A Mercury
Sacramento, Ca	G1F030473	PCTss-003M-0001-SO	MJ071	Nitroglycerine Method 8330, Nitroquanidine Method 8330 Modified Nitrocellulose 353.2
Sacramento, Ca	G1F030473	Trip Blank	MJ073	VOC Method 8260
Denver, Co	G1F030473	PCTss-001M-0001-SO	280-16702-1	Method 6860 Perchlorate
Denver	G1F030473	PCTss-001M-0001-DUP	280-16702-2FD	Method 6860 Perchlorate
Denver	G1F030473	PCTss-003M-0001-SO	280-16702-5	Method 6860 Perchlorate
Denver	G1F030473	PCTss-002M-0001-SO	280-16702-3	Method 6860 Perchlorate
Denver	G1F030473	PCTss-002M-0001-ER	280-16702-4	Method 6860 Perchlorate
North Canton, Oh	G1F030473	PCTss-001M-0001-SO	G1F030473-001 Work Order MJ07E	Nitrocellulose 353.2
North Canton, Oh	G1F030473	PCTss-001M-0001-DUP	G1F030473-002 Work Order MJ07K	Nitrocellulose 353.2
North Canton, Oh	G1F030473	PCTss-003M-0001-SO	G1F030473-006 Work Order MJ07K	Nitrocellulose 353.2
North Canton, Oh	G1F030473	PCTss-002M-0001-SO	G1F030473-004 Work Order MJ07R	Nitrocellulose 353.2 Method 9012A Cyanide Method 160.3 % Solids
North Canton, Oh	G1F030473	PCTss-002M-0001-ER	G1F030473-005 Work Order MJ070	Nitrocellulose 353.2 Method 9012A Cyanide

1.1 Sample Data Selection Criteria

All of the QA/QC data was reviewed for the samples in all project numbers based upon the following criteria.

Flagging Criteria: All samples that had R, J, E, and B flags were checked.

All Samples were 100% verified. As the QA/QC data was reviewed, all samples that were affected by any QA/QC outlier was isolated and further reviewed. Ten Percent (10%) of the samples were then fully reviewed including 10% of the data was recalculated and checked.

The data was validated in accordance with the analytical methods and the documents entitled:

- The DoD Quality System Manual (QSM) is the primary reference for QC acceptance criteria. Where not addressed by the DoD QSM the other guidelines will be used.
- USEPA Test Methods for evaluating Solid Waste SW-846
- National Functional Guidelines for Data Validation
- The US Army Corp Louisville Chemistry Guideline, Version 5.0

All data is computer generated and has been consistent. The data package used by Test America is an industry standard and re-calculation consistently demonstrates that there were no issues with the data in terms of accuracy of the calculations. Calculations that may be generated by hand were checked. However, the computer data generation systems used by Test America are 100% accurate based upon the input. **The only time that data validation issues arise is when the calibration, QA or QC does not meet established criteria and sample data is generated and reported within the outlying criteria.**

The results of the data validation are presented in the following subsections.

Section 2.0 Quality Control Results
Section 3.0 QC Summary
Section 4.0 References
Appendix A, B

2.0 Quality Control Results

This section provides a summary of the laboratory QC results, which were used to meet the project data quality objectives (DQOs) for the investigation. The section below outlines what parts of each method were checked and a brief statement is provided where issues may occur. However a tabular summary is provided in the Appendix A.

2.1 All organic data utilizes the same validation flagging letters.
B= Blank Contamination in the method blank
J= Estimated Value (used primarily when the result is below the reporting limit (RL) but above the detection limit (DL)), otherwise, when QA/QCs are out of range but the sample result is above the reporting limit.
R= Rejected (used when calibrations and QA/QCs fail) often used per analyte when multiple compounds or elements are analyzed by the same method.

2.1.1 Metals Data Soils ICP Method 6010B and 6010B (trace) Soil, and Water.

Test America uses a B Flag as and estimated value for blank results that are greater than the Method Detection Limit (MDL) and below the Reporting Limit (RL) or Method Reporting Limit (MRL). This flag is not recognized by the National Functional Guidelines but is useful when determining the validity of data. In accordance with the DoD QSM document, data reported between the MDL and the RL was reported and flagged with a J as estimated.

The J flag is also used for data that is considered estimated for other quality control reasons as well. All data that was J flagged was reviewed by the data validator and an evaluation provided in the summary as well as a table with the data. All changes in flags by the data validator are fully explained.

No B Flags were changed in this set of data as no issues as stated above existed.

2.2 Method 8260B Volatile Organic Compounds (Water)
The validation reviewed only those compounds of concern. All other compounds in the total 8260B list were not validated.

2.2.1 Initial Calibration
All method requirements were met for all data generated.

2.2.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met. All LCS compounds recovered with in the guideline limits. The LCS Dup was also within guideline limits. The LCS/LCS Dup also substituted for the sample dup and all Relative Percent Differences passed.

2.2.3 Continuing Calibration Checks. (CCCs)
All method requirements were met. All CCCs recovered within the guideline limits.

2.2.4 Matrix Spike and Matrix Spike Duplicate Analysis
Not enough sample was provided for a MS/MSD analysis.

2.2.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.2.6 Method Blank
All of the blanks were below the reporting limit for water. Acetone was detected in the method blank but well below the reporting limit. Acetone is a common contaminant in the organic laboratory.

2.2.7 Field Duplicate (Sample Duplicate) Analysis
No field duplicate was available.

2.2.8 Surrogates
All surrogates met method and USACE Louisville Guidelines

2.2.9 Internal Standards
All Internal Standards met method guidelines.

2.2.10 Tuning
Tuning requirements for the method were met.

2.2.11 SPCC Check
The SPCC Check met all method requirements.

2.2.12 Manual Integration
The laboratory followed all proper protocols for manual integration. Other multi peak compounds such as total Xylenes also followed proper protocol.

2.2.13 Holding Time
The holding time for this sample was met.

2.2.14 Relative Retention Times
All relative retention times and retention time windows met method requirements.

2.3 Method 8260B Volatile Organic Compounds (Soil)

2.3.1 Initial Calibration
All method requirements were met for all data generated.

2.3.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met. All LCS compounds recovered with in the guideline limits. The LCS Dup was also within guideline limits. The LCS/LCS Dup also substituted for the sample dup and all Relative Percent Differences passed.

2.3.3 Continuing Calibration Checks. (CCCs)
All method requirements were met. All CCCs recovered within the guideline limits.

2.3.4 Matrix Spike and Matrix Spike Duplicate Analysis
Not enough sample was provided for a MS/MSD analysis.

2.3.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.3.6 Method Blank
All of the blanks were below the reporting limit for water. Acetone was detected in the method blank but well below the reporting limit. Acetone is a common contaminant in the organic laboratory.

2.3.7 Field Duplicate (Sample Duplicate) Analysis
No field duplicate was available.

2.3.8 Surrogates
All surrogates met method and USACE Louisville Guidelines

2.3.9 Internal Standards
All Internal Standards met method guidelines.

2.3.10 Tuning
Tuning requirements for the method were met.

2.3.11 SPCC Check
The SPCC Check met all method requirements.

2.3.12 Manual Integration
The laboratory followed all proper protocols for manual integration. Other multi peak compounds such as total Xylenes also followed proper protocol.

2.3.13 Holding Time
The holding time for this sample was met.

2.3.14 Relative Retention Times
All relative retention times and retention time windows met method requirements.

2.4 Method 8270C Semi-Volatile Organic Compounds (Water)
The validation reviewed only those compounds of concern. All other compounds in the total 8270C list were not validated.

2.4.1 Initial Calibration
All method requirements were met for all data generated.

2.4.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met. All LCS compounds recovered with in the guideline limits. The LCS Dup was also within guideline limits. The LCS/LCS Dup also substituted for the sample dup and all Relative Percent Differences passed.

2.4.3 Continuing Calibration Checks. (CCCs)

All method requirements were met. All CCCs recovered within the guideline limits.

2.4.4 Matrix Spike and Matrix Spike Duplicate Analysis
Not enough sample was provided for a MS/MSD analysis.

2.4.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.4.6 Method Blank
All of the blanks were below the reporting limit for water.

2.4.7 Field Duplicate (Sample Duplicate) Analysis
No field duplicate was available.

2.4.8 Surrogates
All surrogates met method and USACE Louisville Guidelines except for Phenol-d5 and 2-Fluorophenol in the method blank. However the internal standard met method guidelines. Due to the holding time and lack of sample, no further action can be taken. It is the professional judgment of data validator that the surrogate recoveries did not affect the data. The same issue was true with the LCS.

2.4.9 Internal Standards
All Internal Standards met method guidelines.

2.4.10 Tuning
Tuning requirements for the method were met.

2.4.11 SPCC Check
The SPCC Check met all method requirements.

2.4.12 Manual Integration
The laboratory followed all proper protocols for manual integration.

2.4.13 Holding Time
The associated soil sample had no detectable compounds and was analyzed within holding times.

2.4.14 Relative Retention Times
All relative retention times and retention time windows met method requirements.

2.5 Method 8270C Semi-Volatile Organic Compounds (Soil)

The validation reviewed only those compounds of concern. All other compounds in the total 8270C list were not validated.

2.5.1 Initial Calibration
All method requirements were met for all data generated.

2.5.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met. All LCS compounds recovered within the guideline limits. The LCS Dup was also within guideline limits. The LCS/LCS Dup also substituted for the sample dup and all Relative Percent Differences passed.

2.5.3 Continuing Calibration Checks. (CCCs)
All method requirements were met. All CCCs recovered within the guideline limits.

2.5.4 Matrix Spike and Matrix Spike Duplicate Analysis
All compounds met method recovery requirements except of 3,3-Dichlorobenzidene which recovered biased low. No additional measures were taken to verify the reason for the low recovery thus the MS/MSD recovery issue for the single compound is not significant and does not affect the overall data, thus all sample data is valid.

2.5.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.5.6 Method Blank
All of the blanks were below the reporting limit for water.

2.5.7 Field Duplicate (Sample Duplicate) Analysis
No field duplicate was available.

2.5.8 Surrogates
All surrogates met method and USACE Louisville Guidelines.

2.5.9 Internal Standards
All Internal Standards met method guidelines.

2.5.10 Tuning
Tuning requirements for the method were met.

2.5.11 SPCC Check
The SPCC Check met all method requirements.

2.5.12 Manual Integration

The laboratory followed all proper protocols for manual integration.

2.5.13 Holding Time
The holding time for this sample was met.

2.5.14 Relative Retention Times
All relative retention times and retention time windows met method requirements.

2.6 Method 8081A Pesticides (Water)
The validation reviewed only those compounds of concern.

2.6.1 Initial Calibration
All method requirements were met for all data generated.

2.6.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met. All LCS compounds recovered with in the guideline limits. The LCS Dup was also within guideline limits and all Relative Percent Differences passed.

2.6.3 Continuing Calibration Checks. (CCCs)
All method requirements were met. All CCCs recovered within the guideline limits.

2.6.4 Matrix Spike and Matrix Spike Duplicate Analysis
Not enough sample was provided for a MS/MSD analysis.

2.6.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met for most compounds. Beta-BHC and Heptachlor had slightly high recoveries. Since those same compounds were not detected in the sample the positive bias has no affect on the sample data.

2.6.6 Method Blank
All of the blanks were below the reporting limit for water.

2.6.7 Field Duplicate (Sample Duplicate) Analysis
No field duplicate was available.

2.6.8 Surrogates
All surrogates met method and QSM guidelines except the LCS and LCS Dup Surrogate Decachlorobiphenyl recovered low. However all of the compounds recovered within their respective limits. Since two surrogates were present, and the second surrogate was within guideline criteria, all LCS data is valid.

2.6.9 Manual Integration
The laboratory followed all proper protocols for manual integration.

2.6.10 Holding Time
The associated soil sample had no detectable compounds and was analyzed within holding times.

2.6.11 Endrin and 4,4'-DDT Breakdown
All breakdown analysis passed method requirements.

2.6.12 Retention Times
All retention times and retention time windows met method requirements.

2.6.13 Second Column Confirmation
Second column confirmation was not required as no compounds were detected.

2.7 Method 8081A Pesticides (Soil)
The validation reviewed only those compounds of concern.

2.7.1 Initial Calibration
All method requirements were met for all data generated.

2.7.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met. All LCS compounds recovered with in the guideline limits. The LCS Dup was also within guideline limits and all Relative Percent Differences passed.

2.7.3 Continuing Calibration Checks. (CCCs)
All method requirements were met. All CCCs recovered within the guideline limits.

2.7.4 Matrix Spike and Matrix Spike Duplicate Analysis
All method requirements were met. All Matrix Spike compounds recovered with in the guideline limits. The Matrix Spike Duplicate was also within guideline limits and all Relative Percent Differences passed.

2.7.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met for most compounds. Beta-BHC and Heptachlor had slightly high recoveries. Since those same compounds were not detected in the sample the positive bias has no affect on the sample data.

2.7.6 Method Blank
All of the blanks were below the reporting limit for water.

2.7.7 Field Duplicate (Sample Duplicate) Analysis
No field duplicate was available.

2.7.8 Surrogates
All surrogates met method and USACE Louisville Guidelines.

2.7.9 Manual Integration
The laboratory followed all proper protocols for manual integration.

2.7.10 Holding Time
There was no holding time issue with the sample.

2.7.11 Endrin and 4,4'-DDT Breakdown
All breakdown analysis passed method requirements.

2.7.12 Retention Times
All retention times and retention time windows met method requirements.

2.7.13 Second Column Confirmation
Second column confirmation was not required as no compounds were detected.

2.8 Method 8082 Polychlorinated Biphenyl (PCBs) (Water)
The validation reviewed only those compounds of concern.

2.8.1 Initial Calibration
All method requirements were met for all data generated.

2.8.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met. All LCS compounds recovered with in the guideline limits. The LCS Dup was also within guideline limits and all Relative Percent Differences passed.

2.8.3 Continuing Calibration Checks. (CCCs)
All method requirements were met. All CCCs recovered within the guideline limits.

2.8.3 Matrix Spike and Matrix Spike Duplicate Analysis (MS/MSD)
There was not sufficient sample provided to perform a MS/MSD.

2.8.4 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis

All method requirements were met.

2.8.5 Method Blank
All of the blanks were below the reporting limit for water.

2.8.6 Field Duplicate (Sample Duplicate) Analysis
No field duplicate was available.

2.8.7 Surrogates
All surrogates met method and USACE Louisville Guidelines.

2.8.8 Manual Integration
The laboratory followed all proper protocols for manual integration.

2.8.9 Holding Time
There was no holding time issue with the sample.

2.8.10 Retention Times
All retention times and retention time windows met method requirements.

2.8.11 Second Column Confirmation
Second column confirmation was not required as no compounds were detected.

2.9 Method 8082 Polychlorinated Biphenyl (PCBs) (Soil)
The validation reviewed only those compounds of concern.

2.9.1 Initial Calibration
All method requirements were met for all data generated.

2.9.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met. All LCS compounds recovered with in the guideline limits. The LCS Dup was also within guideline limits and all Relative Percent Differences passed.

2.9.3 Continuing Calibration Checks. (CCCs)
All method requirements were met. All CCCs recovered within the guideline limits.

2.9.4 Matrix Spike and Matrix Spike Duplicate Analysis
All method requirements were met. All Matrix Spike compounds recovered with in the guideline limits. The Matrix Spike Duplicate was also within guideline limits and all Relative Percent Differences passed.

2.9.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.9.6 Method Blank
All of the blanks were below the reporting limit for water.

2.9.7 Field Duplicate (Sample Duplicate) Analysis
No field duplicate was available.

2.9.8 Surrogates
All surrogates met method and USACE Louisville Guidelines.

2.9.9 Manual Integration
The laboratory followed all proper protocols for manual integration.

2.9.10 Holding Time
There was no holding time issue with the sample.

2.9.11 Retention Times
All retention times and retention time windows met method requirements.

2.9.12 Second Column Confirmation
Second column confirmation was not required as no compounds were detected.

2.10 Method 8330 Explosives (Water)
The validation reviewed only those compounds of concern.

2.10.1 Initial Calibration
All method requirements were met for all data generated.

2.10.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met. All LCS compounds recovered with in the guideline limits. The LCS Dup was also within guideline limits and all Relative Percent Differences passed.

2.10.3 Continuing Calibration Checks. (CCCs)
All method requirements were met. All CCCs recovered within the guideline limits.

2.10.4 Matrix Spike and Matrix Spike Duplicate Analysis (MS/MSD)
All method requirements were met. All Matrix Spike compounds recovered with in the guideline limits. The Matrix Spike Duplicate

was also within guideline limits and all Relative Percent Differences passed.

2.10.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.10.5 Method Blank
All of the blanks were below the reporting limit for water.

2.10.6 Field Duplicate (Sample Duplicate) Analysis
No field duplicate was available.

2.10.7 Surrogates
All surrogates met method and USACE Louisville Guidelines.

2.10.8 Manual Integration
The laboratory followed all proper protocols for manual integration.

2.10.9 Holding Time
There was no holding time issue with the sample.

2.10.10 Retention Times
All retention times and retention time windows met method requirements.

2.10.11 Second Column Confirmation
Second column confirmation was not required as no compounds were detected.

2.11 Method 8330 Explosives (Soil)
The validation reviewed only those compounds of concern.

2.11.1 Initial Calibration
All method requirements were met for all data generated.

2.11.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met. All LCS compounds recovered with in the guideline limits. The LCS Dup was also within guideline limits and all Relative Percent Differences passed.

2.11.3 Continuing Calibration Checks. (CCCs)
All method requirements were met. All CCCs recovered within the guideline limits.

2.11.4 Matrix Spike and Matrix Spike Duplicate Analysis

All method requirements were met. All Matrix Spike compounds recovered with in the guideline limits. The Matrix Spike Duplicate was also within guideline limits and all Relative Percent Differences passed.

2.11.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.11.6 Method Blank
All of the blanks were below the reporting limit for water.

2.11.7 Field Duplicate (Sample Duplicate) Analysis
The field duplicate was non-detect as well as the original sample. No percent difference can be calculated. (Nitroglycerine only).

2.11.8 Surrogates
All surrogates met method and USACE Louisville Guidelines.

2.11.9 Manual Integration
The laboratory followed all proper protocols for manual integration.

2.11.10 Holding Time
There was no holding time issue with the sample.

2.11.11 Retention Times
All retention times and retention time windows met method requirements.

2.11.12 Second Column Confirmation
Second column confirmation was not required as no compounds were detected.

2.12 Method 8330 Modified Nitorguanidine (Water)
The validation reviewed only the compound of concern.

2.12.1 Initial Calibration
All method requirements were met for all data generated.

2.12.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met. The LCS ands LCS Dup compound recovered with in the guideline limits and the Relative Percent Difference passed.

2.12.3 Continuing Calibration Checks. (CCCs)

All method requirements were met. The CCCs recovered within the guideline limits.

2.12.4 Matrix Spike and Matrix Spike Duplicate Analysis (MS/MSD)
All method requirements were met. The Matrix Spike and Matrix Spike Duplicate compound recovered within the guideline limits and the Relative Percent Difference passed.
.

2.12.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.12.6 Method Blank
All of the blanks were below the reporting limit for water.

2.12.7 Field Duplicate (Sample Duplicate) Analysis
No field duplicate was available.

2.12.8 Surrogates
No surrogate is used in this method.

2.12.9 Manual Integration
The laboratory followed all proper protocols for manual integration.

2.12.10 Holding Time
There was no holding time issue with the sample.

2.12.11 Retention Times
All retention times and retention time windows met method requirements.

2.12.12 Second Column Confirmation
Second column confirmation was not required as no compounds were detected.

2.13 Method 8330 Modified Nitroguanidine (Soil)
The validation reviewed only the compound of concern.

2.13.1 Initial Calibration
All method requirements were met for all data generated.

2.13.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met. The LCS and LCS Dup compound recovered within the guideline limits and the Relative Percent Difference passed.

2.13.3 Continuing Calibration Checks. (CCCs)
All method requirements were met. All CCCs recovered within the guideline limits.

2.13.4 Matrix Spike and Matrix Spike Duplicate Analysis
All method requirements were met. The Matrix Spike and Matrix Spike Duplicate compound recovered within the guideline limits and the Relative Percent Difference passed.

2.13.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.13.6 Method Blank
All of the blanks were below the reporting limit for water.

2.13.7 Field Duplicate (Sample Duplicate) Analysis
The field duplicate was non-detect as well as the original sample. No percent difference can be calculated.

2.13.8 Surrogates
No surrogate is used in this method.

2.13.9 Manual Integration
The laboratory followed all proper protocols for manual integration.

2.13.10 Holding Time
There was no holding time issue with the sample.

2.13.11 Retention Times
All retention times and retention time windows met method requirements.

2.13.12 Second Column Confirmation
Second column confirmation was not required as no compounds were detected.

2.14 Method 6860 Perchlorate by ICMS (Water)
The validation reviewed only the compound of concern.

2.14.1 Initial Calibration
All method requirements were met.

2.14.2 Laboratory Control Sample (LCS) (Second Source Compounds)

All method requirements were met. The LCS ands LCS Dup compound recovered with in the guideline limits and the Relative Percent Difference passed.

2.14.3 LC Interference Check Standard
The LC Interference Check Standard recovered within the guideline limits.

2.14.4 Matrix Spike and Matrix Spike Duplicate Analysis (MS/MSD)
The Matrix Spike and Matrix Spike Duplicate was run on another sample that was not part of the client's sample batch and has no affect on the sample in this report.

2.14.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.14.6 Method Blank, Initial Calibration Blank
All of the blanks were below the reporting limit for water.

2.14.7 Field Duplicate (Sample Duplicate) Analysis
No field duplicate was available.

2.14.8 Holding Time
There was no holding time issue with the sample.

2.14.9 Retention Times
All retention times and retention time windows met method requirements.

2.15 Method 6860 Perchlorate by ICMS (Soil)
The validation reviewed only the compound of concern.

2.15.1 Initial Calibration
All method requirements were met for all data generated.

2.15.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met. The LCS and LCS Dup compound recovered within the guideline limits and the Relative Percent Difference passed.

2.15.3 LC Interference Check Standard
The LC Interference Check Standard recovered within the guideline limits

2.15.4 Matrix Spike and Matrix Spike Duplicate Analysis

The Matrix Spike and Matrix Spike Duplicate compound recovered biased high and the Relative Percent Difference passed. The high bias has no affect on the non-detected value in the sample. The reported data is valid.

2.15.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.15.6 Method Blank
All of the blanks were below the reporting limit for water.

2.15.7 Field Duplicate (Sample Duplicate) Analysis
The field duplicate was non-detect as well as the original sample. No percent difference can be calculated.

2.15.8 Holding Time
There was no holding time issue with the sample.

2.15.9 Retention Times, Relative Retention Time
All retention times and retention time windows met method requirements.

2.16 Method 353.2 Nitrocellulose General Chemistry (Water)
The validation reviewed only the compound of concern.

2.16.1 Initial Calibration
All method requirements were met.

2.16.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met.

2.16.3 Continuing Calibration Verification
All Continuing Calibration Verifications passed method requirements.

2.16.4 Matrix Spike and Matrix Spike Duplicate Analysis (MS/MSD)
The Matrix Spike and Matrix Spike Duplicate was run on another sample that was not part of the client's sample batch and has no affect on the sample in this report.

2.16.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.16.6 Method Blank, Initial Calibration Blank, Continuing Calibration Blank
All of the blanks were below the reporting limit for water.

2.16.7 Field Duplicate (Sample Duplicate) Analysis
No field duplicate was available.

2.16.8 Holding Time
There was no holding time issue with the sample.

2.17 Method 353.2 Nitrocellulose General Chemistry (Soil)
The validation reviewed only the compound of concern.

2.17.1 Initial Calibration
All method requirements were met.

2.17.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met.

2.17.3 Continuing Calibration Verification
All Continuing Calibration Verifications passed method requirements.

2.17.4 Matrix Spike and Matrix Spike Duplicate Analysis (MS/MSD)
The Matrix Spike and Matrix Spike Duplicate passed as well as the RPD.

2.17.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.17.6 Method Blank, Initial Calibration Blank, Continuing Calibration Blank
All of the blanks were below the reporting limit for water.

2.17.7 Field Duplicate (Sample Duplicate) Analysis
The field duplicate was non-detect as well as the original sample. No percent difference can be calculated.

2.17.8 Holding Time
There was no holding time issue with the sample.

2.18 Method 9012A Cyanide General Chemistry (Water)
The validation reviewed only the compound of concern.

2.18.1 Initial Calibration
All method requirements were met.

2.18.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met.

2.18.3 Continuing Calibration Verification
All Continuing Calibration Verifications passed method requirements.

2.18.4 Matrix Spike and Matrix Spike Duplicate Analysis (MS/MSD)
The Matrix Spike passed and the Matrix Spike Duplicate failed low. The RPD failed as well. The sample was non-detect for the compound. It is the professional judgment of the data validator that the MS/MSD does not affect the sample data.

2.18.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.18.5 Method Blank, Initial Calibration Blank, Continuing Calibration Blank
All of the blanks were below the reporting limit for water.

2.18.6 Field Duplicate (Sample Duplicate) Analysis
No field duplicate was available.

2.18.7 Holding Time
There was no holding time issue with the sample.

2.19 Method 9012A Cyanide General Chemistry (Soil)
The validation reviewed only the compound of concern.

2.19.1 Initial Calibration
All method requirements were met.

2.19.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met.

2.19.3 Continuing Calibration Verification
All Continuing Calibration Verifications passed method requirements.

2.19.4 Matrix Spike and Matrix Spike Duplicate Analysis (MS/MSD)
The Matrix Spike and Matrix Spike Duplicate passed as well as the RPD.

2.19.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis

All method requirements were met.

2.19.6 Method Blank, Initial Calibration Blank, Continuing Calibration Blank
All of the blanks were below the reporting limit.

2.19.7 Field Duplicate (Sample Duplicate) Analysis
The field duplicate was non-detect as well as the original sample. No percent difference can be calculated.

2.19.8 Holding Time
There was no holding time issue with the sample.

2.20 Method 7470A Mercury (Water)
The validation reviewed only the element of concern.

2.20.1 Initial Calibration
All method requirements were met.

2.20.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met.

2.20.3 Continuing Calibration Verification
All Continuing Calibration Verifications passed method requirements.

2.20.4 Matrix Spike and Matrix Spike Duplicate Analysis (MS/MSD)
The Matrix Spike and the Matrix Spike Duplicate passed and the RPD was within method limits.

2.20.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.20.6 Method Blank, Initial Calibration Blank, Continuing Calibration Blank
All of the blanks were below the reporting limit for water.

2.20.7 Field Duplicate (Sample Duplicate) Analysis
No field duplicate was available.

2.20.8 Holding Time
There was no holding time issue with the sample.

2.21 Method 7471A Mercury (Soil)
The validation reviewed only the element of concern.

2.21.1 Initial Calibration
All method requirements were met.

2.21.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met.

2.21.3 Continuing Calibration Verification
All Continuing Calibration Verifications passed method requirements.

2.21.4 Matrix Spike and Matrix Spike Duplicate Analysis (MS/MSD)
The Matrix Spike and Matrix Spike Duplicate passed as well as the RPD.

2.21.5 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.21.6 Method Blank, Initial Calibration Blank, Continuing Calibration Blank
All of the blanks were below the reporting limit.

2.21.7 Field Duplicate (Sample Duplicate) Analysis
No field duplicate was provided.

2.21.8 Holding Time
There was no holding time issue with the sample.

2.22 Method 6010B and 6010B trace Metals (Water)
The validation reviewed only the elements of concern.

2.22.1 Initial Calibration
All method requirements were met.

2.22.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met.

2.22.3 Continuing Calibration Verification
All Continuing Calibration Verifications passed method requirements.

2.22.4 Method Blank, Preparation Blank, Initial Calibration Blank (ICB), and the Continuing Calibration Blank (CCB) Analysis
All of the blanks were below the reporting limit.

2.22.5 Matrix Spike and Matrix Spike Duplicate Analysis (MS/MSD)

The Matrix Spike and Matrix Spike Duplicate passed as well as the RPD for many elements.

2.22.6 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.22.7 The Inter-element Correction Standard A & B (ICSAB)
The ICSAB recoveries all were within the 80-120% recovery range required by the method for all project numbers.

2.22.8 ICP Serial Dilution
No serial dilution as no elements were detected 4 time higher than the reporting limit.

2.22.9 Field Duplicate (Sample Duplicate) Analysis
No field duplicate provided.

2.23 Method 6010B and 6010B trace Metals (Soil)
The validation reviewed only the elements of concern.

2.23.1 Initial Calibration
All method requirements were met.

2.23.2 Laboratory Control Sample (LCS) (Second Source Compounds)
All method requirements were met.

2.23.3 Continuing Calibration Verification
All Continuing Calibration Verifications passed method requirements.

2.23.4 Method Blank, Preparation Blank, Initial Calibration Blank (ICB), and the Continuing Calibration Blank (CCB) Analysis
All of the blanks were below the reporting limit.

2.23.5 Matrix Spike and Matrix Spike Duplicate Analysis (MS/MSD)
The Matrix Spike and Matrix Spike Duplicate passed as well as the RPD for many elements. The elements that had concentration that were more than 4 times greater than the spike concentration are not valid and do not have any affect on data (Aluminum, Iron, Manganese). The MS for lead met method requirements while the MSD for lead was slightly low (68% recovery vs a lower limit of 75%). This indicates that the sample matrix (homogeneity) may be the issue. Unless Methods of Standard Additions or sample duplicate is performed, interference is assumed and not verified, thus it is the professional judgment of the data validator that the data is valid.

Antimony in soil very rarely recovers well. The antimony recovery for both the Matrix Spike and Matrix Spike Duplicate were less than 10%. This recovery level is very common. There is a strong indication that the digestion procedure is the problem and not the sample. Antimony is not a common element in soil, thus it is the professional judgment of the data validator that the data for Antimony is valid.

2.23.6 Contract Required Detection Limit Standard and Reporting Limit Standard Analysis
All method requirements were met.

2.23.7 The Inter-element Correction Standard A & B (ICSAB)
The ICSAB recoveries all were within the 80-120% recovery range required by the method for all project numbers.

2.23.8 ICP Serial Dilution
The serial dilution passed for all elements that qualified. Elements that were not at least 10 time the reporting limit would not qualify.

2.23.9 Field Duplicate (Sample Duplicate) Analysis
No field duplicate provided.

3.0 QC Summary

3.1 Executive Summary

3.3.1 All Methods
All of the system quality controls were met. There is no indication that any instrument quality control did not meet method or National Functional Guideline criteria. In all cases if the data validator removes or changes a flag, a full explanation is provided. There were no reasons to change any flags in this report.

3.3.2 Data Validator Narrative
For each issue the data validator provided an explanation for each issue that would have affected data. There were no issues in any sample or method that would have adversely affected any data. All data is valid and useful.

3.3.3 Holding Times
The issue regarding the holding time for the Equipment Rinse water was minor and it is the professional judgment of the data validator that the Equipment Rinse data is valid and useful.

3.4 Usability and Comparability

Usability of data was evaluate by assuring that all of the analytical requests were met, samples were received in the proper condition, and all analysis were performed within the appropriate holding times. Additionally, all quality control and quality assurance measures were taken to assure accurate and useable data. All samples that are J flagged are flagged because the reported value is below the Reporting Limit. No sample in any batch is J flagged for any other reason. The use of the data that is below the Reporting Limit should be considered estimated. **All sample data above the Report Limit is valid and usable.**

An overview of the validation findings are presented in tabular form in Appendix A. Appendix B contains the check sheets and any additional comments are found in those sheets. The suggested data validation flags are listed below and are defined as follows:

R Quality Control (QC) indicated the data is not usable.

J Indicates an estimated value.

E The Serial Dilution exceeded the maximum 10% limit.

U Indicates the compound or analyte was analyzed for, but not detected at or above the stated limit.

B The compound was also detected in the method blank.

The above flags are incorporated in the data table where they apply based upon the National Functional guidelines. Any flags generated by the laboratory utilizing the laboratory's internal QC program are not presented in the data tables.

All Data for all of the project number in this report are usable and valid.

4.0 References
National Functional Guidelines
USACE Guidelines Version 5 June 2002.
DoD Quality System Manual (QSM)

Glossary of Terms

°C	degrees Celsius
CCB	Continuing Calibration Blank (used in Metals analysis)
CCV	Continuing Calibration Verification (used in all methods to verify system calibration)
CLP	Contract Laboratory Program (used in Superfund program)
COC	Chain of Custody
%D	Percent Difference
DQO	Data Quality Objectives
DS	Down Stream
FB	Field Blank
FD	Field Duplicate
ICB	Initial Calibration Blank (used primarily in metals analysis)
ICP	Inductively Coupled Plasma
ICPMS	Inductively Coupled Plasma Mass Spectrometer
ICV	Initial Calibration Verification (second source standard used to initially verify the calibration curve.
ICS	Interference Check Solution (used in ICP and ICPMS only)
ICSA	Interference Check Solution A
ICSAB	Interference Check Solution A&B combined
IS	Internal Standard
LCG	Louisville Chemistry Guideline Version 5
LCS	Laboratory Control Sample
MRL	Method Reporting Limit (MRL)
MDL	Method Detection Limit (MDL)
MD	Matrix Duplicate (often referred to as the sample duplicate)
MSA	Method of Standard Additions
MS/MSD	Matrix Spike (MS)/Matrix Spike Duplicate (MSD)
PARCC	Precision, Accuracy, Represenativeness, Completeness, Comparability
PD	Post Digested Spike (also PDS)
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
SAP	Sampling and Analysis Plan
SD	Standard Deviation
SDG	Sample Delivery Group
SOP	Standard Operating Procedure (SOPs is plural)
TB	Trip Blank
TCLP	Toxic Compound Leaching Procedure
TERC	Total Environmental Restoration Contract
USACE or ACE	United States Army Corps of Engineers Army Corps of Engneers
USEPA	United States Environmental Protection Agency
%R	Percent Recovery

Appendix A
All Sample Data and Flagging

Purves Environmental
Data Validation Specialists

Table MA-1 Summary of Analytical Results **Soil and Water Matrix** **TAL Including Mercury**

Field Sample ID:	PCTss-002M-0001-SO			PCTss-002M-0001-ER		
Laboratory ID:	G1F030473 MJ07R			G1F030473 MJ070		
Date Sampled:	5/26/11			5/26/11		
Date Received:	6/3/11			6/3/11		
Date Prepared:	6/10/11			6/9/11		
Date Analyzed:	6/14/11			6/9/11		
Holding Time	15 days			14 days		
Required Hold Time	180 days			180 days		
Metals		Lab	VF		Lab	VF
Method 6010B	Result	Flag	Flag	Result	Flag	Flag
Aluminum	10600			U		
Arsenic	8.4			U		
Barium	81.7			U		
Beryllium	0.45			U		
Calcium	954			U		
Cadmium	0.13	B	J	U		
Cobalt	7.7			U		
Chromium	14.5			U		
Copper	12.1			U		
Iron	17600			U		
Potassium	654			U		
Magnesium	1770			U		
Manganese	833			U		
Sodium	35.6	B	J	U		
Nickel	18.5			U		
Lead	34.1			U		
Antimony	U			U		
Selenium	U			20.6	B	J
Thallium	U			U		
Vandium	24.4			U		
Zinc	62.4			U		
Silver	U			U		
	mg/Kg			mg/L		
Method 7471A						
Date Sampled:	5/26/11			5/26/11		
Date Received:	6/3/11			6/3/11		
Date Prepared:	6/14/11			6/15/11		
Date Analyzed:	6/14/11			6/16/11		
Holding Time	19 days			20 days		
Required Hold Time	180 days			28 days		
Mercury	0.049			U		
	mg/Kg			mg/L		

B = Result is above the Method Detection Limit (MDL) but below the Reporting Limit (RL)
The RESULT IS ESTIMATED
J = RESULT IS ESTIMATED
U = Result is below the MDL or ND = Not Detected
VF= Validator Flag

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Table SS-1 Sample Summary and Analysis Table Soils

PIKA Field Sample ID:	PCTss-001M-0001-SO	PCTss-001M-0001-DUP	PCTss-002D-0001-SO	PCTss-002M-0001-SO	PCTss-003M-0001-SO
Date Sampled:	5/26/11 10:25AM	5/26/11 10:25AM	5/26/11 11:15AM	5/26/11 11:20AM	5/26/11 1:05PM
Scacramento Laboratory ID:	G1F030473 MJ07E	G1F030473 MJ07K	G1F030473 MJ07L	G1F030473 MJ07R	G1F030473 MJ071
Date Received:	6/3/11 09:10AM	6/3/11 09:10AM	6/3/11 09:10AM	6/3/11 09:10AM	6/3/11 09:10AM
Analysis Performed					
8260B VOCs			X		
8270C SVOCs				X	
8081A Pesticides				X	
8082 PCBs				X	
8330 Explosives	X	X		X	X
8330 Mod Nitroguanidine				X	
6010B TAL Metals				X	
Denver Laboratory ID:	280-16702-1	280-16702-2FD		280-16702-3	280-16702-5
Date Received:	6/8/11 0930	6/8/11 0930		6/8/11 0930	6/8/11 0930
Analysis Performed					
6860 Perchlorate	X	X		X	X
Samples Picked up by North Canton Facility and distributed from that facility					
North Canton Laboratory ID:	G1F030473-001 MJ07E	G1F030473-001 MJ07E	11/7/08	G1F030473-001 MJ07E	G1F030473-001 MJ07E
Date Received:	5/26/11 1530	5/26/11 1530	5/26/11 1530	5/26/11 1530	5/26/11 1530
Analysis Performed					
9012A Cyanide				X	
353.2 Nitrocellulose	X	X		X	X
% Solids 160.3				X	

Table SS-1 Sample Summary and Analysis Table (Waters)

PIKA Field Sample ID:	PCTss-002M-0001-ER	Trip Blank
Date Sampled:	5/26/11 08:40AM	
Scacramento Laboratory ID:	G1F030473 MJ070	G1F030473 MJ073
Date Received:	6/3/11 09:10AM	6/3/11 09:10AM
Analysis Performed		
8260B VOCs		X
8270C SVOCs	X	
8081A Pesticides	X	
8082 PCBs	X	
8330 Explosives	X	
8330 Mod Nitroguanidine	X	
6010B TAL Metals	X	
Denver Laboratory ID:	280-16702-1	280-16702-2FD
Date Received:	6/8/11 0930	6/8/11 0930
Analysis Performed		
6860 Perchlorate	X	
Samples Picked up by North Canton Facility and distributed from that facility		
North Canton Laboratory ID:	G1F030473-001 MJ07E	G1F030473-001 MJ07E
Date Received:	5/26/11 1530	5/26/11 1530
Analysis Performed		
9012A Cyanide	X	
353.2 Nitrocellulose	X	
% Solids 160.3		

Table VOC-1 Summary of Analytical Results Volatile Organic Compounds (VOCs) **Soil & Water**

Field Sample ID:	PCTss-002D-0001-SO			Trip Blank		
Laboratory ID:	G1F030473 MJ07L			G1F030473 MJ073		
Date Sampled:	5/26/11 11:15AM					
Date Received:	6/3/11 09:10AM			6/3/11 09:10AM		
Date Analyzed:	6/7/11			6/8/11		
Holding Time	12 days			13 days		
Required Hold Time	14 Days			14 days		
VOCs		Lab	VF		Lab	VF
Method 8260B	Result	Flag	Flag	Result	Flag	Flag
Methylene Chloride	U			U		
4-Methyl-2-pentanone	U			U		
Styrene	U			U		
1,1,2,2-Tetrachloroethane	U			U		
Tetrachloroethene	U			U		
Toluene	U			U		
1,1,1-Trichloroethane	U			U		
1,1,2-Trichloroethane	U			U		
Trichloroethene	U			U		
Vinyl Chloride	U			U		
Xylenes (Total)	U			U		
Acetone	5.3	J,B	J,B	U		
Benzene	U			U		
Bromodichloromethane	U			U		
Bromoform	U			U		
Bromomethane	U			U		
2-Butanone	U			U		
Carbon Disulfide	U			U		
Carbon Tetrachloride	U			U		
Chlorobenzene	U			U		
Dibromochloromethane	U			U		
Chloroethane	U			U		
1,1-Dichloroethane	U			U		
1,2-Dichloroethane	U			U		
1,1-Dichloroethene	U			U		
1,2-Dichloroethene (Total)	U			U		
1,2-Dichloropropane	U			U		
cis-1,3-Dichloropropene	U			U		
trans-1,3-Dichloropropene	U			U		
Ethylbenzene	U			U		
2-Hexanone	U			U		
	ug/Kg			ug/L		

B = Result is above the Method Detection Limit (MDL) but below the Reporting Limit (RL)
J = RESULT IS ESTIMATED
U = Result is below the MDL or ND = Not Detected
VF= Validator Flag

Table SVOC-1 Summary of Analytical Results Semi-Volatile Organic Compounds (SVOCs) (cont)

Soil & Water

Field Sample ID:	PCTss-002D-0001-SO			PCTss-002M-0001-ER		
Laboratory ID:	G1F030473 MJ07L			G1F030473 MJ070		
Date Sampled:	5/26/11 11:15AM			5/26/11 08:40AM		
Date Received:	6/3/11 09:10AM			6/3/11 09:10AM		
Date Prepared:	6/7/2011			6/9/2011		
Date Analyzed:	6/20/11			6/20/11		
Holding Time	14 days			12 days		
Required Hold Time (prep)	14 Days			14 days		
SVOCs		Lab	VF		Lab	VF
Method 8270C	Result	Flag	Flag	Result	Flag	Flag
Acenaphthene	U			U		
Acenaphthylene	U			U		
Benzo(a)anthracene	U			U		
Benzo(b)fluoranthene	U			U		
Benzo(k)fluoranthene	U			U		
Benzo(ghi)perylene	U			U		
Benzo(a)pyrene	U			U		
bis(2-chloroethoxy) methane	U			U		
bis(2-Ethylhexyl)phthalate	U			U		
4-Bromophenyl phenyl ether	U			U		
Butyl benzyl phthalate	U			U		
Carbazole	U			U		
4-Chloroaniline	U			U		
4-Chloro-3-methylphenol	U			U		
2-Chloronaphthalene	U			U		
4-Chlorophenyl phenyl ether	U			U		
Chrysens	U			U		
Dibenzo(a,h)anthracene	U			U		
Dibenzofuran	U			U		
Di-n-butyl phthalate	U			U		
1,2-Dichlorobenzene	U			U		
1,3-Dichlorobenzene	U			U		
1,4-Dichlorobenzene	U			U		
3,3'-Dichlorobenzidine	U			U		
2,4-Dichlorophenol	U			U		
Diethyl phthalate	U			U		
2,4-Dimethylphenol	U			U		
Dimethyl phthalate	U			U		
4,6-Dinitro-2-methylphenol	0.14	J	J	U		
2,4-Dinitrophenol	U			U		
	ug/Kg			ug/L		

B = Result is above the Method Detection Limit (MDL) but below the Reporting Limit (RL)

J = RESULT IS ESTIMATED

U = Result is below the MDL or ND = Not Detected

VF= Validator Flag

Table PEST-1 Summary of Analytical Results Pesticides Compounds (8081A) Soil & Water

Field Sample ID:	PCTss-002D-0001-SO			PCTss-002M-0001-ER		
Laboratory ID:	G1F030473 MJ07L			G1F030473 MJ070		
Date Sampled:	5/26/11 11:15AM			5/26/11 08:40AM		
Date Received:	6/3/11 09:10AM			6/3/11 09:10AM		
Date Prepared:	6/9/2011			6/7/2011		
Date Analyzed:	6/22/11			6/22/11		
Holding Time	14 days			12 days		
Required Hold Time (prep)	14 Days			14 days		
Pesticides		Lab	VF		Lab	VF
Method 8081A	Result	Flag	Flag	Result	Flag	Flag
alpha-BHC	U			U		
gamma-BHC	U			U		
Heptachlor	U			U		
Aldrin	U			U		
beta-BHC	U			U		
delta-BHC	U			U		
Heptachlor epoxide	U			U		
Endosulfan I	U			U		
gamma-Chlordane	U			U		
alpha-Chlordane	U			U		
4,4'-DDE	0.73*	J	J	U		
Dieldrin	U			U		
endrin	U			U		
4,4'-DDT	U			U		
Endrin aldehyde	U			U		
Methoxychlor	U			U		
Endosulfan Sulfate	U			U		
Endrin Ketone	U			U		
Toxaphene	U			U		
	ug/Kg			ug/L		

B = Result is above the Method Detection Limit (MDL) but below the Reporting Limit (RL)
J = RESULT IS ESTIMATED
U = Result is below the MDL or ND = Not Detected
VF= Validator Flag

A confirmation analysis was performed, however to concentration is below the reporting limit and is estimated at best. No further evaluation is required.

Table PCB-1 Summary of Analytical Results 8082 Polychlorinated Biphenols (PCBs) **Soil & Water**

Field Sample ID:	PCTss-002D-0001-SO			PCTss-002M-0001-ER		
Laboratory ID:	G1F030473 MJ07L			G1F030473 MJ070		
Date Sampled:	5/26/11 11:15AM			5/26/11 08:40AM		
Date Received:	6/3/11 09:10AM			6/3/11 09:10AM		
Date Prepared:	6/9/2011			6/7/2011		
Date Analyzed:	6/15/11			6/12/11		
Holding Time	14 days			12 days		
Required Hold Time (prep)	14 Days			14 days		
PCBs		Lab	VF		Lab	VF
Method 8082	Result	Flag	Flag	Result	Flag	Flag
Arochlor 1016	U			U		
Arochlor 1221	U			U		
Arochlor 1232	U			U		
Arochlor 1242	U			U		
Arochlor 1248	U			U		
Arochlor 1254	U			U		
Arochlor 1260	U			U		
	ug/Kg			ug/L		

B = Result is above the Method Detection Limit (MDL) but below the Reporting Limit (RL)- RESULT IS ESTIMATED
J = RESULT IS ESTIMATED
U = Result is below the MDL or ND = Not Detected
VF=Validator flag

Table EA-1 Summary of Analytical Results Explosives 8330 **Soils & Water**

Field Sample ID:	PCTss-002D-0001-SO			PCTss-002M-0001-ER			PCTss-001M-0001-SO			PCTss-001M-0001-DUP			PCTss-003M-0001-SO		
Laboratory ID:	G1F030473 MJ07L			G1F030473 MJ070			G1F030473 MJ07E			G1F030473 MJ07K			G1F030473 MJ071		
Date Sampled:	5/26/11 11:15AM			5/26/11 08:40AM			5/26/11 11:15AM			5/26/11 11:15AM			5/26/11 11:15AM		
Date Received:	6/3/11 09:10AM			6/3/11 09:10AM			6/3/11 09:10AM			6/3/11 09:10AM			6/3/11 09:10AM		
Date Prepared:	6/8/2011			6/6/2011			6/8/2011			6/8/2011			6/8/2011		
Date Analyzed:	6/13/11			6/9/11			6/13/11			6/13/11			6/13/11		
Holding Time	13 days			11 days			13 days			13 days			13 days		
Required Hold Time	14 Days			14 days			14 days			14 days			14 days		
8330 Compound	Result	LF	VF	Results	LF	VF	Results	LF	VF	Results	LF	VF	Results	LF	VF
PETN	U			U											
Nitroglycerin	U			U											
2-Amino-4,6-Dintrotoluene	U			U											
4-Amino-2,6-Dinitrotoluene	U			U											
1,3-Dinitrobenzene	U			U											
2,4-Dinitrotoluene	U			U											
2,6-Dinitrotoluene	U			U											
HMX	U			U											
Nitrobenzene	U			U											
2-Nitrotoluene	U			U											
4-Nitrotoluene	U			U											
3-Nitrotoluene	U			U											
RDX	U			U											
Tetryl	U			U											
1,3,5-Trinitrobenzene	U			U											
2,4,6-Trinitrotoluene	U			U											
Nitroglycerin	U			U			U			U			U		
	mg/Kg			ug/L			mg/Kg			mg/Kg			mg/Kg		

B = Result is above the Method Detection Limit (MDL) but below the Reporting Limit (RL)- RESULT IS ESTIMATED
J = RESULT IS ESTIMATED
U = Result is below the MDL or ND = Not Detected
VF=Validator flag

Table PROP-1 Summary of Analytical Results Propellants **Soils & Water**

Field Sample ID:	PCTss-002D-0001-SO			PCTss-002M-0001-ER			PCTss-001M-0001-SO			PCTss-001M-0001-DUP			PCTss-003M-0001-SO		
Laboratory ID:	G1F030473 MJ07L			G1F030473 MJ070			G1F030473 MJ07E			G1F030473 MJ07K			G1F030473 MJ071		
Date Sampled:	5/26/11 11:15AM			5/26/11 08:40AM			5/26/11 11:15AM			5/26/11 11:15AM			5/26/11 11:15AM		
Date Received:	6/3/11 09:10AM			6/3/11 09:10AM			6/3/11 09:10AM			6/3/11 09:10AM			6/3/11 09:10AM		
Date Prepared:	6/8/2011			6/6/2011			6/8/2011			6/8/2011			6/8/2011		
Date Analyzed:	6/13/11			6/9/11			6/13/11			6/13/11			6/13/11		
Holding Time	13 days			11 days			13 days			13 days			13 days		
Required Hold Time	14 Days			14 days			14 days			14 days			14 days		
8330 Modified	Result	LF	VF	Results	LF	VF	Results	LF	VF	Results	LF	VF	Results	LF	VF
Nitroguanidine	U			U			0.063	J	J	0.12	J	J	0.17	J	J
	mg/Kg			ug/L			mg/Kg			mg/Kg			mg/Kg		

Field Sample ID:	PCTss-002D-0001-SO			PCTss-002M-0001-ER			PCTss-001M-0001-SO			PCTss-001M-0001-DUP			PCTss-003M-0001-SO		
Laboratory ID:	G1F030473 MJ07L			G1F030473 MJ070			G1F030473 MJ07E			G1F030473 MJ07K			G1F030473 MJ071		
Date Sampled:	5/26/11 11:15AM			5/26/11 08:40AM			5/26/11 11:15AM			5/26/11 11:15AM			5/26/11 11:15AM		
Date Received:	6/3/11 09:10AM			6/3/11 09:10AM			6/3/11 09:10AM			6/3/11 09:10AM			6/3/11 09:10AM		
Date Prepared:	6/15/11			6/9/11			6/15/11			6/15/11			6/15/11		
Date Analyzed:	6/16/11			6/10/11			6/16/11			6/16/11			6/16/11		
Holding Time	20 days			20 days			20 days			20 days			20 days		
Required Hold Time	28 Days			28 days			28 days			28 days			28 days		
353.2 Nitrocellulose	Result	LF	VF	Results	LF	VF	Results	LF	VF	Results	LF	VF	Results	LF	VF
Nitrocellulose	U			U			1.1	B	J	0.82	B	J			
	mg/Kg			ug/L			mg/Kg			mg/Kg			mg/Kg		

Field Sample ID:	PCTss-002D-0001-SO			PCTss-002M-0001-ER			PCTss-001M-0001-SO			PCTss-001M-0001-DUP			PCTss-003M-0001-SO		
Laboratory ID:	280-16702-3			280-16702-3			280-16702-3			280-16702-3			280-16702-3		
Date Sampled:	5/26/11 11:15AM			5/26/11 08:40AM			5/26/11 11:15AM			5/26/11 11:15AM			5/26/11 11:15AM		
Date Received:	6/3/11 09:10AM			6/3/11 09:10AM			6/3/11 09:10AM			6/3/11 09:10AM			6/3/11 09:10AM		
Date Prepared:	6/9/11						6/9/11			6/9/11			6/9/11		
Date Analyzed:	6/15/11			6/15/11			6/15/11			6/15/11			6/15/11		
Holding Time	20 days			20 days			20 days			20 days			20 days		
Required Hold Time	28 Days			28 days			28 days			28 days			28 days		
6860 Perchlorate	Result	LF	VF	Results	LF	VF	Results	LF	VF	Results	LF	VF	Results	LF	VF
Perchlorate	U			U			0.093*	J	J	0.11*	J	J	0.093*	J	J
	mg/Kg			ug/L			mg/Kg			mg/Kg			mg/Kg		

*Value is less than the reporting limit but greater than the detection limit.

B = Result is above the Method Detection Limit (MDL) but below the Reporting Limit (RL)- RESULT IS ESTIMATED

J = RESULT IS ESTIMATED

U = Result is below the MDL or ND = Not Detected

VF=Validator flag

Table CN-1 Summary of Analytical Results Cyanide

Soil & Water

Field Sample ID:	PCTss-002D-0001-SO			PCTss-002M-0001-ER		
Laboratory ID:	G1F030473 MJ07L			G1F030473 MJ070		
Date Sampled:	5/26/11 11:15AM			5/26/11 08:40AM		
Date Received:	6/3/11 09:10AM			6/3/11 09:10AM		
Date Prepared:	6/8/2011			6/6/2011		
Date Analyzed:	6/13/11			6/9/11		
Holding Time	13 days			11 days		
Required Hold Time	14 Days			14 days		
Method 9012A	Result	LF	VF	Results	LF	VF
Cyanide	0.19	B	J	U		
	mg/Kg			ug/L		

B = Result is above the Method Detection Limit (MDL) but below the Reporting Limit (RL)- RESULT IS ESTIMATED

J = RESULT IS ESTIMATED

U = Result is below the MDL or ND = Not Detected

VF=Validator flag

Appendix B
Check Lists

Purves Environmental

ICP Metals Analysis (6010) Check List Soil & Water

Project Name: CC-RVAAP-80
Project #: 10-08-130
Laboratory: Test America Sacremento
Sample Delivery Group: G1F030473

		Yes	No
Holding Time:	Samples were analyzed within holding time (6-Months)	Yes	
Initial Calibration	One calibration standard and blank		No
	Two calibration standard and blank		No
	Three calibration standard and blank	Yes	
	R > 0.995	Yes	

Comment

QC Method Detection Limit (MDL)

	MDL Check	Yes	

QC Method Reporting Limit (MRL)

	MRL Check at the beginning	Yes	
	MRL Check every 12 hours	Yes	

Intital Calibration Verification (ICV)

	%Recovery 90-110%	Yes	

Initial Calibration Blank (ICB)

	Blank Analytes <1/2 MRL	Yes	

Interelement Check Standard

	ICS-A run at the beginning	Yes	
	ICS-AB results within 80-120% recovery	Yes	

Continuing Calibration Blank (CCB)

	CCB every ten samples	Yes	
	CCB at end or run	Yes	
	CCB analytes < 1/2 MRL	Yes	

Continuing Calibration Verification (CCV)

	CCV every ten samples	Yes	
	CCV at end of run	Yes	
	CCV 90-110% Recovery	Yes	

Sample Analysis

	Samples greater than linear range diluted	Yes	

Sample QC

	Method Blank <1/2 MRL	Yes	
	LCS recoveries within required limits	Yes	
	MS/MSD recoveries within required limits		No
	MD RPD within control limits	Yes	

Comments

Method, Initial Calibration and Continuing Calibration Blanks

All were not detected.

Matrix Spike/Matrix Spike Dilution

Lead had a low recovery for the MSD (66% vs 75%) No real issue Data valid May be homogenety
that in the case of matrix spike and matrix spike duplicates, each analyte should be evaluated carefully. Additionally, the martix that is being spiked represents only the sample being spiked and not the entire sampling batch. Though soils in the same sampling group are being evaluated, each soil is unique. The data in this MS/MSD evaluation should be used as a guidance regarding possible matrix interference but should not have a direct affect on data.
The Method of Standard Additions should be used as a possible verification of a matrix affect.

Serial Dilution

	Serial Dilution (1:4) conducted as required.	Yes	
	Was there agreement between diluted and undiluted results? <10% recovery?	Yes	

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ICP Metals Analysis (6010) Check List (continued pg 2) Soil & Water

Project Name: CC-RVAAP-80
Project #: 10-08-130
Laboratory: Test America Sacremento
Sample Delivery Group: G1F030473

Method of Standard Additions (MSA)

Was it performed as needed on samples of suspected matrix affects?		No
Was R > 0.995		

Comments:

Signed: _____
William W. Purves

Mercury Analysis (7471A/7470A) Check List Soil & Water

Project Name: CC-RVAAP-80
Project #: 10-08-130
Laboratory: Test America Sacremento
Sample Delivery Group: G1F030473

		Yes	No
Holding Time:	Samples were analyzed within holding time (6-Months)	Yes	
Initial Calibration	Five calibration standard and blank	Yes	
	R > 0.995	Yes	
QC Method Detection Limit (MDL)			
	MDL Check	Yes	
Intital Calibration Verification (ICV)			
	%Recovery 90-110%	Yes	
Initial Calibration Blank (ICB)			
	Blank Analytes <1/2 MRL	Yes	
Continuing Calibration Verification (CCV)			
	CCV every ten samples	Yes	
	CCV at end of run	Yes	
	CCV 90-110% Recovery	Yes	
Continuing Calibration Blank (CCB)			
	CCB every ten samples	Yes	
	CCB at end or run	Yes	
	CCB analytes < 1/2 MRL	Yes	
Sample Analysis			
	Samples greater than linear range diluted	n/a	
Sample QC			
	Method Blank <1/2 MRL	Yes	
	LCS recoveries within required limits	Yes	
	MS recoveries within required limits	Yes	
	MD RPD within control limits	Yes	
Method of Standard Additions (MSA)			
	Was it performed as needed on samples of suspected matrix affects?		No
	Was R > 0.995		

Comments
No issues found in this analysis.

Signed: _____
William W. Purves

Purves Environmental

Nitroaromatic & Nitramine Data Analysis (Explosive Residues) Checklist Soil & Water

Project Name: CC-RVAAP-80
Project #: 10-08-130
Laboratory: Test America Sacremento
Sample Delivery Group: G1F030473

		Yes	No
Holding Time:	Were Samples extracted within holding times?	Yes	
	Were Samples analyzed within holding times?	Yes	
Initial Calibration	Five calibration standard minimum	Yes	
Manual Integration			
	Was manual integration "M" performed?		No
QCMDL	Was MDL check performed?	Yes	
QCMRL			
	Was QCMRL run at the beginning and end of every daily sequence or every 12 hours?	Yes	
	Was the % "D" <30%	Yes	
Intital Calibration Verification (ICV)			
	Is the mid level (2nd source) recovery within 85-115%	Yes	
Continuing Calibration Verification (CCV)			
	Was CCV run at the beginning of the day or run every 12 hours?	Yes	
	Was the midpoint sample (CCV) conducted every ten samples or every 12 hours?	Yes	
	Was the midpoint sample (CCV) conducted at the end of the day/run.	Yes	
	Did the CCV meet the minimum requirements (D<15% with a maximum D < 20% for a specific compound.	Yes	
Sample Analysis			
	Was the RT of an identified componet within the required retention time window.	Yes	
	Were all identified hits, above the initial calibration curve diluted and reanalyzed	Yes	
	Were all identified compounds confirmed on a second column	Yes	
	Was all RPD of target analyte confirmation <40%	Yes	
	Was there a shoulder on the 2,4,6-TNT peak?		No
Sample Quality Control			
Method Blank	Were Target analytes < 1/2 the MRL for the Method Blank	Yes	
LCS	Were the % recoveries for the LCS within the limits?		No
MS/MSD	Were percent recovries within control limits?	Yes	
	Were RPD within control limits?	Yes	

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Nitroaromatic & Nitramine Data Analysis (Explosive Residues) Checklist (cont pg 2) Soil & Water

Project Name: CC-RVAAP-80
Project #: 10-08-130
Laboratory: Test America Sacremento
Sample Delivery Group: G1F030473

Comments

Surrogates

Are surrogate recoveries within QC limits	Yes	

Signed: _____
William W. Purves

Purves Environmental

Propellants Nitrocellulose Soil & Water

Project Name: CC-RVAAP-80
Project #: 10-08-130
Laboratory: Test America North Canton
Sample Delivery Group: G1F030473

		Yes	No
Holding Time:	Were Samples analyzed within holding times?	Yes	
Initial Calibration	Was the calibration a minimum of 1 standard and blank?	Yes	
	Was the R^2 >0.995 ?	Yes	
Intital Calibration Verification (ICV)			
	Is the mid level (2nd source) recovery within 90-110%	Yes	
Continuing Calibration Verification (CCV)			
	CCV every ten samples	Yes	
	CCV at end of run	Yes	
	CCV 90-110% Recovery	Yes	
	Was the midpoint sample (CCV) conducted at the end of the run?	Yes	
Continuing Calibration Blank (CCB)			
	CCB every ten samples	Yes	
	CCB at end or run	Yes	
	CCB analytes < 1/2 MRL	Yes	
Sample Analysis			
	Were samples greater than linear range diluted	N/A	
Sample QC			
	Method Blank <1/2 MRL	Yes	
	LCS recoveries within required limits	Yes	
MS/MSD Analysis			
	MS recoveries within required limits	Yes	
	MD RPD within control limits	Yes	

Comments

Signed: _____

William W. Purves

Purves Environmental

General Chemistry Cyanide Soil & Water

Project Name: CC-RVAAP-80
Project #: 10-08-130
Laboratory: Test America North Canton
Sample Delivery Group: G1F030473

		Yes	No
Holding Time:	Were Samples analyzed within holding times?	Yes	
Initial Calibration	Was the calibration a minimum of 1 standard and blank?	Yes	
	Was the R^2 >0.995 ?	Yes	
Intital Calibration Verification (ICV)			
	Is the mid level (2nd source) recovery within 90-110%	Yes	
Continuing Calibration Verification (CCV)			
	CCV every ten samples	Yes	
	CCV at end of run	Yes	
	CCV 90-110% Recovery	Yes	
	Was the midpoint sample (CCV) conducted at the end of the run?	Yes	
Continuing Calibration Blank (CCB)			
	CCB every ten samples	Yes	
	CCB at end or run	Yes	
	CCB analytes < 1/2 MRL	Yes	
Sample Analysis			
	Were samples greater than linear range diluted	N/A	
Sample QC			
	Method Blank <1/2 MRL	Yes	
	LCS recoveries within required limits	Yes	
MS/MSD Analysis			
	MS recoveries within required limits	Yes	
	MD RPD within control limits	Yes	

Comments

Signed: _____

William W. Purves

8330 Modified Propellants Nitroguanidine Soil & Water

Project Name: CC-RVAAP-80
Project #: 10-08-130
Laboratory: Test America Sacremento
Sample Delivery Group: G1F030473

		Yes	No
Holding Time:	Were Samples extracted within holding times?	Yes	
	Were Samples analyzed within holding times?	Yes	
Initial Calibration	Five calibration standard minimum	Yes	
Manual Integration	Was manual integration "M" performed?		No
QCMDL	Was MDL check performed?	Yes	
QCMRL	Was QCMRL run at the beginning and end of every daily sequence or every 12 hours?	Yes	
	Was the % "D" <30%	Yes	
Intital Calibration Verification (ICV)	Is the mid level (2nd source) recovery within 85-115%	Yes	
Continuing Calibration Verification (CCV)	Was CCV run at the beginning of the day or run every 12 hours?	Yes	
	Was the midpoint sample (CCV) conducted every ten samples or every 12 hours?	Yes	
	Was the midpoint sample (CCV) conducted at the end of the day/run.	Yes	
	Did the CCV meet the minimum requirements (D<15% with a maximum D < 20% for a specific compound.	Yes	
Sample Analysis	Was the RT of an identified componet within the required retention time window.	Yes	
	Were all identified hits, above the initial calibration curve diluted and reanalyzed	Yes	
	Were all identified compounds confirmed on a second column	Yes	
	Was all RPD of target analyte confirmation <40%	Yes	
Sample Quality Control			
Method Blank	Were Target analytes < 1/2 the MRL for the Method Blank	Yes	

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8330 Modified Propellants Nitroguanidine Soil & Water

Project Name: CC-RVAAP-80

Project #: 10-08-130

Laboratory: Test America Sacremento

Sample Delivery Group: G1F030473

LCS	Were the % recoveries for the LCS within the limits?	Yes	
MS/MSD	Were percent recovries within control limits?	Yes	
	Were RPD within control limits?	Yes	

Comments

Water sample was not extracted witin holding time, however the water was an equipment rinse and not a natural water.

There was not enough water to run a MS/MSD sample run.

Signed: _____

William W. Purves

Purves Environmental

8081A PESTICIEDS Soil & Water

Project Name: CC-RVAAP-80
Project #: 10-08-130
Laboratory: Test America Sacremento
Sample Delivery Group: G1F030473

		Yes	No
Holding Time:	Were Samples extracted within holding times?	Yes	
	Were Samples analyzed within holding times?	Yes	
Initial Calibration	Five calibration standard minimum	Yes	
Manual Integration	Was manual integration "M" performed?	YES	
QCMDL	Was MDL check performed?	Yes	
QCMRL	Was QCMRL run at the beginning and end of every daily sequence or every 12 hours?	Yes	
	Was the % "D" <30%	Yes	
Intital Calibration Verification (ICV)	Is the mid level (2nd source) recovery within 85-115%	Yes	
Continuing Calibration Verification (CCV)	Was CCV run at the beginning of the day or run every 12 hours?	Yes	
	Was the midpoint sample (CCV) conducted every ten samples or every 12 hours?	Yes	
	Was the midpoint sample (CCV) conducted at the end of the day/run.	Yes	
	Did the CCV meet the minimum requirements (D<15% with a maximum D < 20% for a specific compound.	Yes	
Degradation	Did the Degradation check pass	Yes	
Sample Analysis	Was the RT of an identified componet within the required retention time window.	Yes	
	Were all identified hits, above the initial calibration curve diluted and reanalyzed	n/a	
	Were all identified compounds confirmed on a second column	Yes	
	Was all RPD of target analyte confirmation <40%	Yes	

Sample Quality Control

8081A PESTICIEDS (cont)

Project Name: CC-RVAAP-80
Project #: 10-08-130
Laboratory: Test America Sacremento
Sample Delivery Group: G1F030473

Method Blank	Were Target analytes < 1/2 the MRL for the Method Blank	Yes	
LCS	Were the % recoveries for the LCS within the limits?	YES	
MS/MSD	Were percent recovries within control limits?	Yes	
	Were RPD within control limits?	Yes	
Surrogates			
	Are surrogate recoveries within QC limits	Yes	

Soil & Water

Water sample was not extracted witin holding time, however the water was an equipment rinse and not a natural water. There was not enough water to run a MS/MSD sample run.

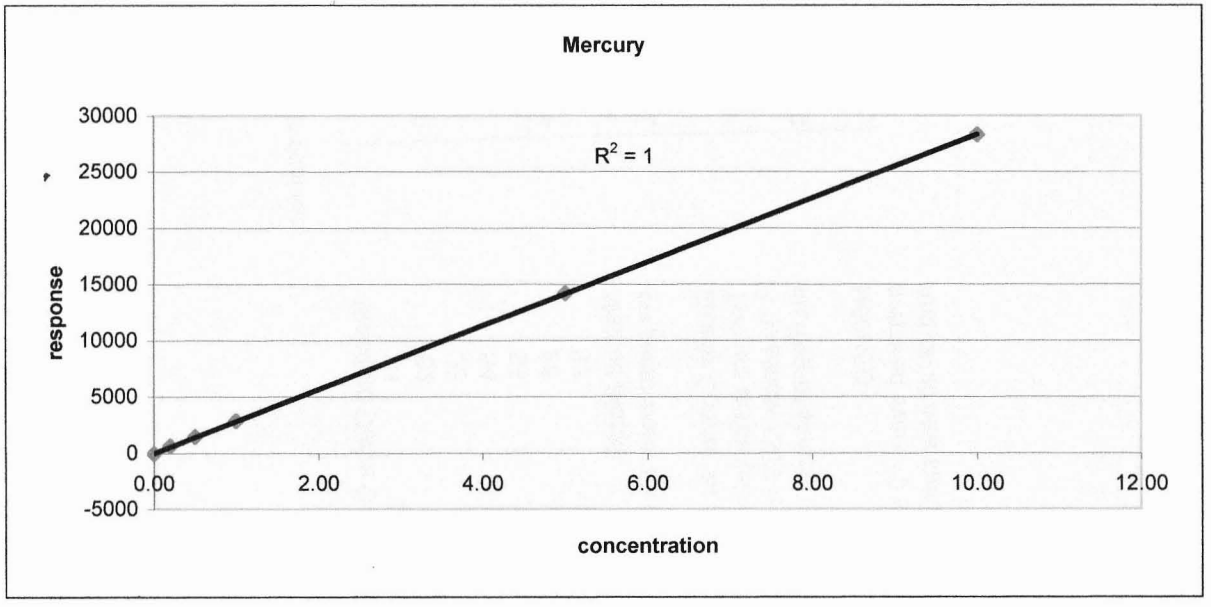
Signed: _____

William W. Purves

Standard Calibration Check Tables

Table HG-1 Mercury Calibration Check

Metals Method 7471A	Concentration	
Standard	Known	Measured
S1	0.00	-48
S2	0.20	652
S3	0.50	1477
S4	1.00	2854
S5	5.00	14217
S6	10.00	28306



Mercury Sample Calculation Check

Laboratory Sample ID: MJ07R
Sample Counts

1451
0.049 Recalculated sample Concentration
0.049 Reported value

Table QCHg-1 7174A Mercury Quality Control Check Table 10% of Compounds Reported

This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary. This has been proven in the past by the data validator.

Cyanide Method 9012A					
	Known	Measured	%	Recovery	RPD
	Conc	Conc	Recovered	Range	<25%
Method Blank	ND	ND	<1/2RL		
ICV	0.100	0.952	95.2	90-110%	
CCV	1.00	0.09038	90.38	90-110%	
LCS	19.600	22	112.00%	86-114	
MS	0.275	0.244	89	86-114	5.00
MSD	0.262	0.219	84	86-114	

Table CALVER-8260 8260 Calibration Check Table 10% of Compounds Reported Soil

This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary. This has been proven in the past by the data validator.

April 6, 2011 cal date Water

VOCs Method 8260	Acetone		**VOCs Method 8260**	Carbon Disulfide		Benzene	
Standard	Known	Measured	Standard	Known	Measured	Known	Measured
	Conc	Area		Conc	CF	Conc	CF
S1	0.25		S1	0.25	0.65807	0.25	1.11158
S2	0.50	18264	S2	0.50	0.67573	0.50	1.15239
S3	1.00	23509	S3	1.00	0.62175	1.00	1.0167
S4	4.00	44033	S4	4.00	0.68303	4.00	1.04588
S5	20.00	172319	S5	20.00	0.69784	20.00	1.00052
S6	40.00	323872	S6	40.00	0.70002	40.00	0.95515
S7	60.00	521242	S7	60.00	0.7178	60.00	0.99846
S8	80.00	738217	S8	80.00	0.71099	80.00	0.98669
Recal Correl Coef Linear	0.99501		Average RE-CF		0.6831538		1.0334213
Recal Correl Coef Quad	0.99970		Average LAB-CF		0.68315		1.03342
Lab Correl Coef Quad*	0.99828		%RSD	4.606	4.606%	6.472	6.472%

Though the recalculation did not match the Lab correlation, the correlation must be greater than 0.995 to pass.

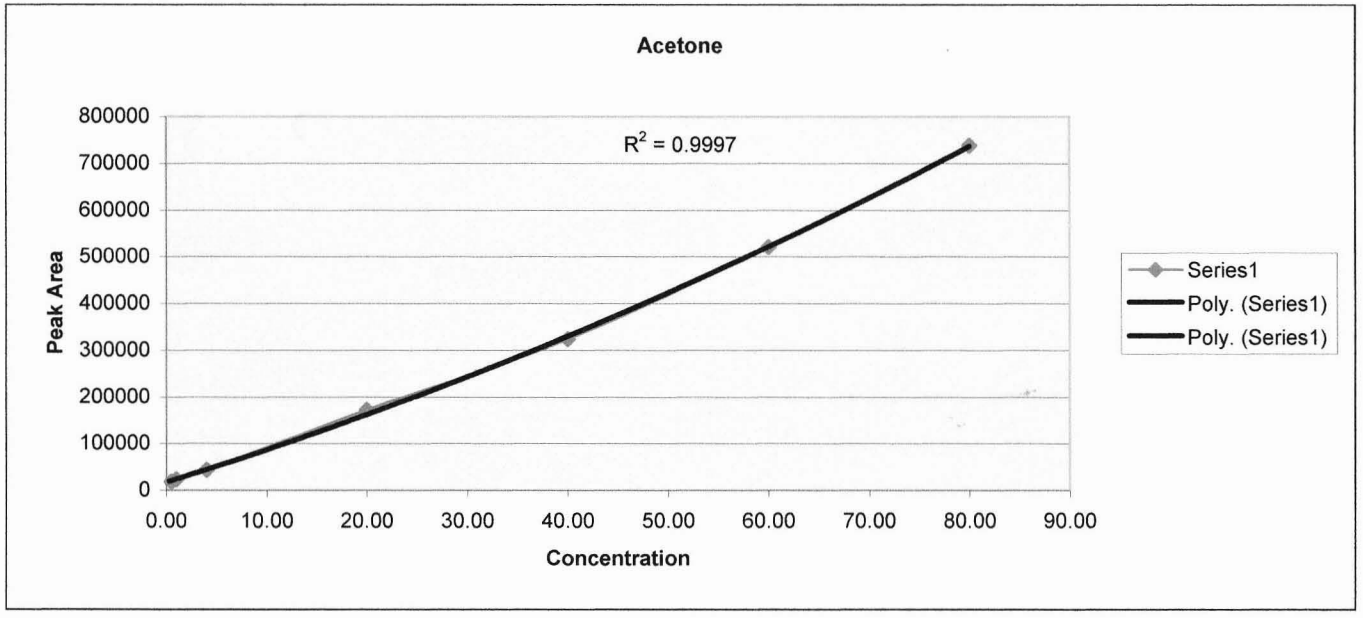


Table CALVER-8260 8260 Calibration Check Table 10% of Compounds Reported Soil

This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary. This has been proven in the past by the data validator.

June 6, 2011 cal date

VOCs Method 8260	Acetone		**VOCs Method 8260**	Carbon Disulfide		Benzene			
Standard	Known	Measured	Standard	Known	Measured	Known	Measured	Peak	Calculated
	Conc	Area		Conc	CF	Conc	CF	Area	CF
S1	1.00		S1	1.00	1.24565	1.00	1.61536	22388	1.6153634
S2	2.50	9875	S2	2.50	1.05854	2.50	1.45978	50705	1.45978
S3	5.00	13317	S3	5.00	1.13901	5.00	1.58679	106063	1.58679
S4	10.00	19503	S4	10.00	1.1902	10.00	1.57557	222626	1.57557
S5	20.00	31986	S5	20.00	1.30901	20.00	1.6331	460930	1.6331
S6	40.00	59041	S6	40.00	1.34588	40.00	1.73046	1000759	1.73046
S7	100.00	138807	S7	100.00	1.32838	100.00	1.6764	2550069	1.6764
Sb	200.00	292604		200.00	1.22563	200.00	1.69036	5762841	1.69036
S9	400.00	580415		400.00	1.22877	400.00	1.75863	12668105	1.75863
Recal Correl Coef Linear	0.99965		Average RE-CF		1.2301189		1.6362722		
Recal Correl Coef Quad	0.99970		Average LAB-CF		1.23012		1.63627		
Lab Correl Coef Quad*	0.99970		%RSD	7.543	7.543%	5.556	5.556%		

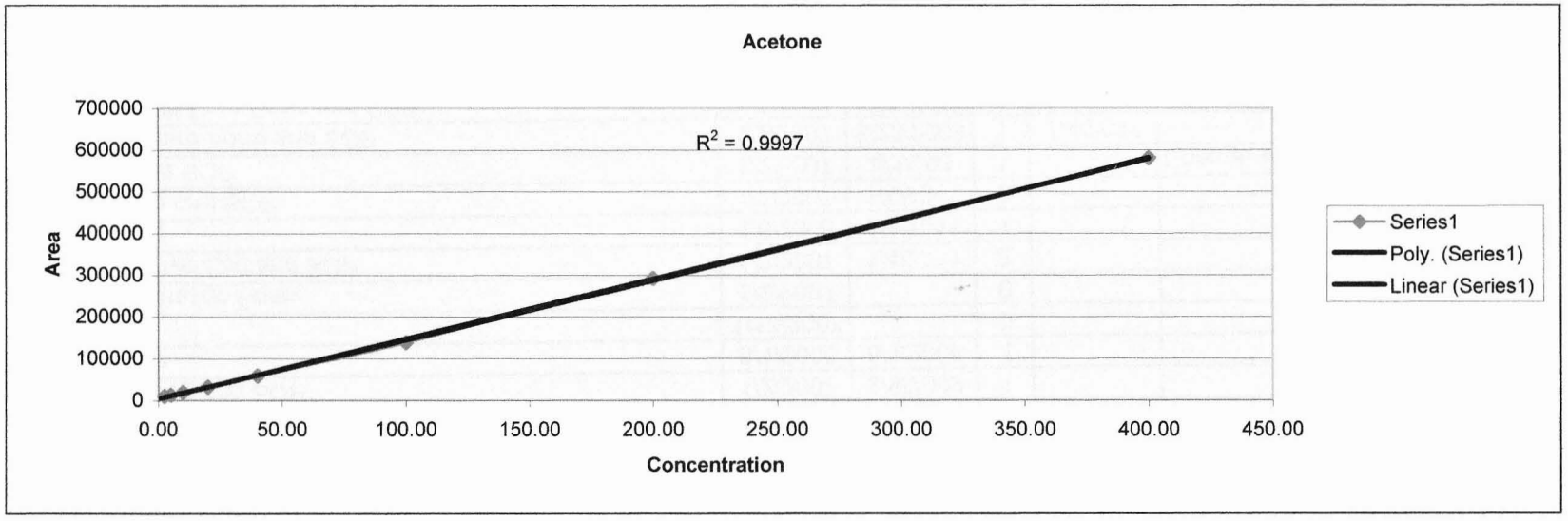


Table QC-8260 8260 Quality Control Check Table 10% of Compounds Reported Soil

This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary. This has been proven in the past by the data validator.

VOCs Method 8260	Acetone				Carbon Disulfide				Benzene			
Standard	Known	Measured	Recovery	% Diff	Known	Measured	Recovery	%Diff	Known	Measured	Recovery	%Diff
	Conc	Conc	Range	Max	RRF	RRF	Range	Max	RRF	RRF	Range	Max
ICV	40.00	38.60856	24-56	*40	1.2688	1.23012	0.76-1.776	40	1.7625	1.63627	1.06-2.47	40
CCC	40.00	38.73623	24-56	40	1.2688	1.21916	0.76-1.776	40	1.7625	1.66664	1.06-2.47	40
ICB	ND	ND	<10		ND	ND	<1/2RL		ND	ND	<1/2RL	
CCB	ND	ND	<1/2RL		ND	ND	<1/2RL		ND	ND	<1/2RL	
	Known	Measured	Recovery	RPD	Known	Measured	Recovery	RPD	Known	Measured	Recovery	RPD
	Conc	Conc	Range	<20	Conc	Conc	Range	<20	Conc	Conc	Range	<20
LCS	40.00	40.2	20-60		40	41.9	25.6-49.2		40	40.3	30-50.4	
Method Blank	ND	3.8	<10		ND	ND	<1/2RL		ND	ND	<1/2RL	
MS	40.00	35	20-60	32.00	40.00	39.6	25.6-49.2	7.70	40.00	38.2	30-50.4	9.80
MSD	40.00	80*	20-60		40.00	42.7	25.6-49.2		40.00	42.1	30-50.4	

* Biased High no affect on non-detect data or data below the Reporting Limit

Table CALVER-8270 8270 Calibration Check Table 10% of Compounds Reported Soil

This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary.
This has been proven in the past by the data validator.
June 6, 2011 cal date

SVOCs Method 8270	Acenaphthene		bis(2-Ethylhexyl) phthalate		2,4-Dimethylphenol		Hexachlorobenzene		Nitrobenzene		Phenol	
Standard	Known	Measured	Known	Measured	Known	Measured	Known	Measured	Peak	Calculated	Peak	Calculated
	Conc	CF	Conc	CF	Conc	CF	Conc	CF	Area	CF	Area	CF
S1	1.00	1.32488	1.00	1.03632	1.00	0.34193	1.00	0.80877	22388	0.40175	22388	2.28874
S2	5.00	1.26564	5.00	0.83547	2.50	0.35128	2.50	0.6716	50705	0.37137	50705	1.9726
S3	10.00	1.23613	10.00	0.83524	5.00	0.34059	5.00	0.66053	106063	0.37655	106063	2.06083
S4	20.00	1.2864	20.00	0.82335	10.00	0.36556	10.00	0.68721	222626	0.37264	222626	2.07634
S5	50.00	1.25044	50.00	0.8771	20.00	0.35574	20.00	0.69681	460930	0.37701	460930	2.0775
S6	80.00	1.24496	80.00	0.908	40.00	0.35566	40.00	0.69662	1000759	0.37099	1000759	2.08455
S7	120.00	1.25873	120.00	0.90942	100.00	0.36413	100.00	0.70336	2550069	0.38297	2550069	2.11519
Sb	160.00	1.20367	160.00	0.92409	200.00	0.35729	200.00	0.69763	5762841	0.37067	5762841	2.07903
Average RE-CF		1.2588563		0.8936238		0.3540225		0.7028163		0.3779938		2.0943475
Average LAB-CF		1.25886		0.89362		0.35402		0.70282		0.37799		2.09435
%RSD	2.847	2.847%	7.77	7.770%	2.584	2.584%	6.439	6.439%	2.77	2.770%	4.237	4.237%

Table QC-8270 8270 Quality Control Check Table 10% of Compounds Reported Soil

This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary. This has been proven in the past by the data validator.

SVOCs Method 8270	Acenaphthene				bis(2-Ethylhexyl) phthalate				2,4-Dimethylphenol			
Standard	Known	Measured	Recovery	% Diff	Known	Measured	Recovery	%Diff	Known	Measured	Recovery	%Diff
	Conc	Conc	Range	Max	RRF	RRF	Range	Max	RRF	RRF	Range	Max
ICV	1.23688	1.25886	0.64-1.91	50	0.88979	0.89362	0.46-1.37	50	0.37755	0.35402	0.18-0.54	50
CCC	1.27142	1.25886	0.64-1.91	50	0.91265	0.89362	0.46-1.37	50	0.36229	0.35402	0.18-0.54	50
ICB	ND	ND	<1/2RL		ND	ND	<1/2RL		ND	ND	<1/2RL	
CCB	ND	ND	<1/2RL		ND	ND	<1/2RL		ND	ND	<1/2RL	
	Known	Measured	Recovery	RPD	Known	Measured	Recovery	RPD	Known	Measured	Recovery	RPD
	Conc	Conc	Range	<20	Conc	Conc	Range	<20	Conc	Conc	Range	<20
Method Blank	ND	ND	<1/2RL		ND	ND	<1/2RL		ND	ND	<1/2RL	
LCS	3.33	2.79	1-4.5		3.33	2.93	1.13-4.96		3.33	2.54	1.1-3.96	
MS	3.34	2.37	1-4.5	6.60	3.34	2.48	1.13-4.96	8.10	3.34	2.14	1.1-3.96	2.40
MSD	3.37	2.53	1-4.5		3.37	2.7	1.13-4.96		3.37	2.19	1.1-3.96	

* Biased High no affect on non-detect data or data below the Reporting Limit

SVOCs Method 8270	Hexachlorobenzene				Nitrobenzene				Phenol			
Standard	Known	Measured	Recovery	% Diff	Known	Measured	Recovery	%Diff	Known	Measured	Recovery	%Diff
	Conc	Conc	Range	Max	RRF	RRF	Range	Max	RRF	RRF	Range	Max
ICV	0.26988	0.2552	0.13-0.39	50	0.38925	0.37799	0.19-0.57	50	2.04921	2.09977	1.64-2.46	20
CCC	0.26149	0.2552	0.13-0.39	50	0.38274	0.37799	0.19-0.57	50	2.04921	2.09435	1.64-2.46	20
ICB	ND	ND	<1/2RL		ND	ND	<1/2RL		ND	ND	<1/2RL	
CCB	ND	ND	<1/2RL		ND	ND	<1/2RL		ND	ND	<1/2RL	
	Known	Measured	Recovery	RPD	Known	Measured	Recovery	RPD	Known	Measured	Recovery	RPD
	Conc	Conc	Range	<20	Conc	Conc	Range	<20	Conc	Conc	Range	<20
Method Blank	ND	ND	<1/2RL		ND	ND	<1/2RL		ND	ND	<1/2RL	
LCS	3.33	2.94	1.07-4.23		3.33	2.5	1-3.83		3.33	2.3	1-4	
MS	3.34	2.45	1.07-4.23	5.30	3.34	2.02	1-3.83	5.70	3.34	2.44	1-4	5.90
MSD	3.37	2.58	1.07-4.23		3.37	2.14	1-3.83		3.37	42.1	1-4	

Table CALVER-8081A 8081A Calibration Check Table 10% of Compounds Reported Soil

This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary. This has been proven in the past by the data validator.

April 6, 2011 cal date Water

Pesticieds Method 8081A	Heptachlor		4,4'-DDT	
Standard	Known	Measured	Known	Measured
	Conc	CF	Conc	CF
S1	1.25		1.25	865565
S2	2.50	1214804	2.50	771508
S3	5.00	1196509	5.00	820535
S4	10.00	1195439	10.00	784719
S5	20.00	1084669	20.00	791838
S6	50.00	1105740	50.00	755519
S7	100.00	1139231	100.00	754613
S8	250.00	1062684	250.00	754303
Average RE-CF		1142725.1		787325
Average LAB-CF		1142725		787325
%RSD	5.302	5.302%	4.960	4.960%

Table QC-8081A 8081A Quality Control Check Table 10% of Compounds Reported Soil

This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary. This has been proven in the past by the data validator.

Pesticieds Method 8081A	Heptchlor				4,4'-DDT			
	Known	Measured	Recovery	RPD	Known	Measured	Recovery	RPD
	Conc	Conc	Range	<20	Conc	Conc	Range	<20
Method Blank	ND	ND	<1/2RL		ND	ND	<1/2RL	
LCS	8.33	8.22	6.66-10		16.7	14	13.34-20	
MS	8.39	8.54	6.66-10	5.60	16.80	13.5	13.34-20	7.10
MSD	8.48	9.03	6.66-10		17.00	14.5	13.34-20	

Table CALVER-8082 8082 Calibration Check Table 10% of Compounds Reported Soil

This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary.
This has been proven in the past by the data validator.
April 6, 2011 cal date Water

PCBs Method 8082	Arochlor 1016	Peak 1	Peak 2	Peak 3	Peak 4	Peak 5
Standard	Known	Measured	Measured	Measured	Measured	Measured
	Conc	CF	CF	CF	CF	CF
S1	50.00	1160050	560108	847634	618119	884475
S2	100.00	1141187	561399	846733	645262	861814
S3	200.00	1007040	493808	754941	566157	768861
S4	300.00	1013958	497593	763484	582891	771201
S5	500.00	958438	467781	732203	605993	737817
S6	1000.00	946501	468290	741932	581969	742805
S7	2000.00	888210	444014	707006	532752	704229
S8	20.00	1161900	564514	831558	635583	860307
Average RE-CF		1034660.5	507188.38	778186.38	596090.75	791438.63
Average LAB-CF		1034661	787325	778186	596091	791439
%RSD		10.299%	9.530%	7.142%	6.291%	8.559%
Lab %RSD		10.299	9.530	7.142	6.291	8.559

Table QC-8081A 8081A Quality Control Check Table 10% of Compounds Reported Soil

This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary.
This has been proven in the past by the data validator.

PCBs Method 8082	Arochlor 1016			
	Known	Measured	%	RPD
	Conc	Conc	Recovered	<20
Method Blank	ND	ND	<1/2RL	
LCS	66.70	65	98	
MS	68.30	63.3	93	8.40
MSD	66.60	68.9	103	

Table CALVER-8330 8330 Calibration Check Table 10% of Compounds Reported Soil

This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary.
This has been proven in the past by the data validator.
April 6, 2011 cal date Water

Explosives Method 8330	2-Nitrotoluene		Nitroglycerin	Peak 1
Standard	Known Conc	Measured CF	Known Conc	Measured CF
S1	5.00	66	5.00	
S2	10.00	57.5	10.00	
S3	20.00	50.65	20.00	86.400
S4	50.00	50.72	50.00	77.580
S5	100.00	49.81	100.00	78.760
S6	200.00	48.835	200.00	75.490
S7	500.00	46.446	500.00	72.724
S8	1000.00	42.85	1000.00	68.336
Average RE-CF		51.601375		76.548333
Average LAB-CF		51.60138		76.5483
%RSD		13.856%		7.972%
Lab %RSD		13.856		7.972

Table QC-8330 8330 Quality Control Check Table 10% of Compounds Reported Soil

This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary.
This has been proven in the past by the data validator.

Explosives Method 8330	2-Nitrotoluene				Nitroglycerin			
	Known Conc	Measured Conc	% Recovered	RPD <25	Known Conc	Measured Conc	% Recovered	RPD <25
Method Blank	ND	ND	<1/2RL		ND	ND	<1/2RL	
LCS	1.00	0.939	94		5.00	4.84	97	
MS	0.952	0.916	96	0.00	4.76	4.59	96	2.00
MSD	0.990	0.955	96		4.95	4.83	98	

Table CALVER-6860 6860 Calibration Check Table 10% of Compounds Reported Soil

This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary.
This has been proven in the past by the data validator.
April 6, 2011 cal date Water

Prechlorate Method 6860	Perchlorate		Nitroglycerin	Peak 1
Standard	Known	Measured	Known	Measured
	Conc	CF	Conc	CF
S1	5.00	66	5.00	
S2	10.00	57.5	10.00	
S3	20.00	50.65	20.00	86.400
S4	50.00	50.72	50.00	77.580
S5	100.00	49.81	100.00	78.760
S6	200.00	48.835	200.00	75.490
S7	500.00	46.446	500.00	72.724
S8	1000.00	42.85	1000.00	68.336
Average RE-CF		51.601375		76.548333
Average LAB-CF		51.60138		76.5483
%RSD		13.856%		7.972%
Lab %RSD		13.856		7.972

Table QC-6860 6860 Quality Control Check Table 10% of Compounds Reported Soil

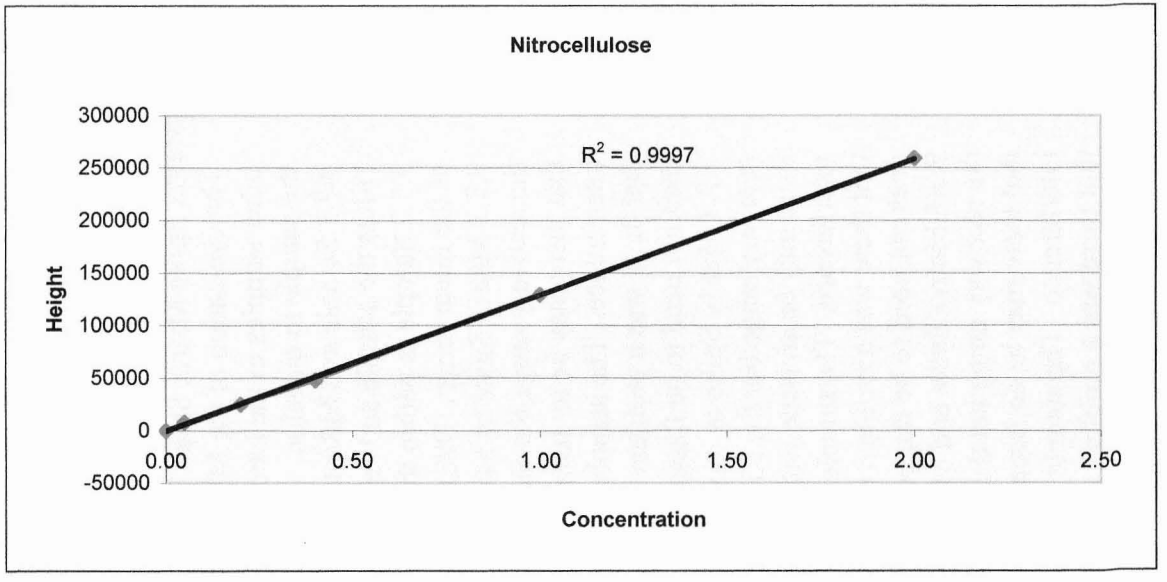
This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary.
This has been proven in the past by the data validator.

Prechlorate Method 6860	Perchlorate				
	Known	Measured	%	Recovery	RPD
	Conc	Conc	Recovered	Range	<25
Method Blank	ND	ND	<1/2RL	70-130	
LCS	0.481	0.536	111		
Interference Check	0.498	0.59	119		
MS	0.486	0.598	123	80-120	5.00
MSD	0.499	0.63	126		

Table Gen Chem-1 Nitrocellulose Calibration Check

Soil

Nitrocellulose Method 353.2	Concentration	
Standard	Known	Measured
S1	0.00	-41
S2	0.05	7909
S3	0.20	25128
S4	0.40	47878
S5	1.00	129162
S6	2.00	259069



Mercury Sample Calculation Check

Laboratory Sample ID: G1F030473-4
Sample Counts 1839
1839
0.64 Recalculated sample Concentration
0.64 Reported value

Table QC-353.2 353.2 Quality Control Check Table 10% of Compounds Reported

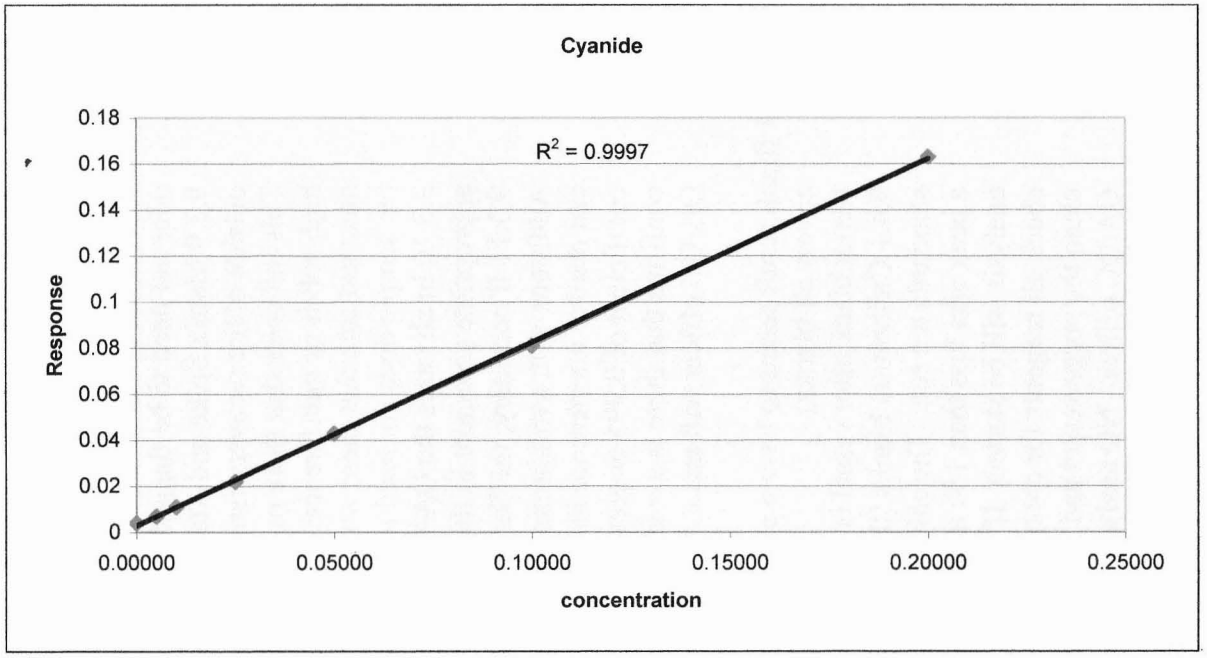
This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary. This has been proven in the past by the data validator.

Nitrocellulose Method 353.2					
	Known	Measured	%	Recovery	RPD
	Conc	Conc	Recovered	Range	<25
Method Blank	ND	ND	<1/2RL	50-150	
ICV	1.000	0.952	95.2		
CCV	1.00	1.028	102.80		
LCS	50.700	22.9	45.20%		
MS	50.700	17.9	35.3	50-150	29.59
MSD	50.000	13.1	26.2		

Table Gen Chem-2 Cyanide 9012A Calibration Check

Soil

Cyanide Method 9012A	Concentration	
Standard	Known	Measured
S1	0.00000	0.004
S2	0.005	0.007
S3	0.010	0.011
S4	0.025	0.022
S5	0.050	0.043
S6	0.100	0.081
S7	0.200	0.163



Mercury Sample Calculation Check

Laboratory Sample ID: G1F030473-4
Sample Counts 1839
1839
0.64 Recalculated sample Concentration
0.64 Reported value

Table QC-1 Cyanide 9012A Quality Control Check Table 10% of Compounds Reported

This table recalculates 10% of the reported compounds. 100% recalculation is not necessary as the computer generated data and these calculation do not vary. This has been proven in the past by the data validator.

Cyanide Method 9012A					
	Known	Measured	%	Recovery	RPD
	Conc	Conc	Recovered	Range	<25
Method Blank	ND	ND	<1/2RL	50-150	
ICV	0.100	0.952	95.2		
CCV	1.00	0.09038	90.38		
LCS	19.600	22	112.00%		
MS	2.110	2.26	98*	50-150	13.00
MSD	2.110	1.98	84*		

*The result is minus the sample concentration

Table 6010B Metals-1 6010B Metals Check Table 10% of Elements Reported

This table recalculates 10% of the reported elements. 100% recalculation is not necessary as the computer generated data and these calculation do not vary. This has been proven in the past by the data validator.

Metals Method 6010B	Calcium Concentration		Cobalt Concentration		Lead Concentration	
Standard	Known	Measured	Known	Measured	Known	Measured
S0	0	0.0020953	0	0	0	0
S1	4	3.96	3.622	3.622	0.12454	0.12454
S2	20	19.191				
Recal Correl Coef		0.9999	1.00000		1.00000	
Lab Correl Coef		1.000	1		1	

Calcium Method 6010B					
	Known	Measured	%	Recovery	RPD
	Conc	Conc	Recovered	Range	<25
Method Blank	ND	ND	<1/2RL	90-110%	
ICB	0	0			
ICV	10000	10354	104%	90-110%	
CCB	0	0			
CCV	25000	25991	104%	90-110%	
ICSA&B				80-120%	
LCS	1000	940	94.00%	80-120%	
MS	5120	6396	125%	75-125%	
MSD	5070	4426	87%	75-125%	>25

Cobalt Method 6010B					
	Known	Measured	%	Recovery	RPD
	Conc	Conc	Recovered	Range	<25
Method Bla	ND	ND	<1/2RL	90-110%	
ICB	0	0			
ICV	1000	1046.7	104.70%	90-110%	
CCB	0	0			
CCV	2500	2499.8	100%	90-110%	
ICSA&B	500	485.18	97%	80-120%	
LCS	50	46.6	93%	80-120%	
MS	51.2	45.5	89%	75-125%	2%
MSD	50.7	43.9	87%	75-125%	

Lead Method 6010B					
	Known	Measured	%	Recovery	RPD
	Conc	Conc	Recovered	Range	<25
Method Blank	ND	ND	<1/2RL	90-110%	
ICB	0	0			
ICV	250	262.92	105%	90-110%	
CCB	0	0			
CCV	500	495.13	99%	90-110%	
ICSA&B	50	55.51	111%	80-120%	
LCS	50	50.4	101%	80-120%	
MS	51.2	34.7	68%	75-125%	
MSD	50.7	50.5	100%	75-125%	>25

Appendix H

Anomaly Cluster Photo Log

Picture showing propellant can and top in cluster area 1 (MI Sample Area 3).

Picture showing propellant can and tops present in cluster area 2.

Picture showing propellant cans and tops present in cluster area 3 (MI Sample Area 2).

Visible propellant can and tops in cluster area 4.

Picture showing propellant can tops present in cluster area 5 (MI Sample Area 1).

Individual propellant can located outside the cluster areas along rail bed near the center of the site.

Individual propellant can debris items visible on surface within the southeastern portion of the site.

END OF REPORT