Revised Final

Remedial Design for the RVAAP-01 Ramsdell Quarry Landfill

Ravenna Army Ammunition Plant
Ravenna, Ohio

GSA Contract No. GS-10F-0076J
Delivery Order No. W912QR-05-F-0033

Prepared for:

United States Army Corps of Engineers
Louisville District

Prepared by:

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June 17, 2010

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14. ABSTRACT

This remedial design presents the plan and procedures for the removal of contaminated soil within the former quarry at RVAAP-01 Ramsdell Quarry Landfill. This is part of the CERCLA requirements to achieve remedy for soil and dry sediment at the AOC.

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Remedial Design for the RVAAP-01 Ramsdell Quarry Landfill

Volume One - Main Report and Attachments
Version 1.0

Ravenna Army Ammunition Plant
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CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Science Applications International Corporation (SAIC) has completed the Final Remedial Design for the RVAAP-01 Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of data quality objectives; technical assumptions; methods, procedures, and materials to be used; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing USACE policy.

Tia L Rutledge — 21 Jan 10

Tia Rutledge
Study/Design Team Leader — Date

Jed Thomas, P.E. — 1/21/2010

Jed Thomas, P.E.
Independent Technical Review Team Leader — Date

Significant concerns and the explanation of the resolution are as follows:

Internal SAIC Independent Technical Review comments are recorded on a Document Review Record per SAIC quality assurance procedure QAAP 3.1. This Document Review Record is maintained in the project file. Changes to the report addressing the comments have been verified by the Study/Design Team Leader.

As noted above, all concerns resulting from independent technical review of the project have been considered.

Jan. 21, 2010

Scott Armstrong
Principal w/ A-E firm — Date

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NEDO = Northeast Ohio District Office
NGB = National Guard Bureau
Ohio EPA = Ohio Environmental Protection Agency
REIMS = Ravenna Environmental Information Management System
RVAAP = Ravenna Army Ammunition Plant
SAIC = Science Applications International Corporation
USACE = United States Army Corps of Engineers
USAEC = United States Army Environmental Center

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ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
A-E	Architect-Engineer
AOC	Area of Concern
APE	Area of Potential Effect
ARAR	Applicable and Relevant or Appropriate Requirements
ASTM	American Society for Testing Materials
BGS	Below Ground Surface
BMP	Best Management Practice
Camp Ravenna	Camp Ravenna Joint Military Training Center
CFR	Code of Federal Regulations
COC	Constituent of Concern
COR	Contracting Officer's Representative
CQAP	Construction Quality Assurance Plan
CRM	Cultural Resources Manager
CUG	Cleanup Goal
DFFO	Director's Final Findings and Orders
DoD	Department of Defense
DOT	Department of Transportation
Dup	Duplicate Sample
EPC	Exposure Point Concentration
ESS	Explosive Safety Submission
FD	Field Duplicate
FS	Feasibility Study
FSA	Field Staging Area
FWSAP	Facility-Wide Sampling and Analysis Plan
FWSHP	Facility-Wide Safety and Health Plan
GPS	Global Positioning System
GSA	General Services Administration
Herb	Herbicides
ICRMP	Integrated Cultural Resources Management Plan
IDW	Investigation-Derived Waste
IRP	Installation Restoration Program
LUC	Land Use Controls
MCL	Maximum Contaminant Level
MEC	Munitions and Explosives of Concern
MI	Multi-Increment
mph	Miles Per Hour
MRS	Munitions Response Site
NCR	Non-Conformance Report
NELAC	National Environmental Laboratory Accreditation Conference

ACRONYMS AND ABBREVIATIONS (CONTINUED)

NGB	National Guard Bureau
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OE	Ordnance and Explosives
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
OHPO	Ohio Historic Preservation Office
ORAM	Ohio Rapid Assessment Method
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbon
PBC	Performance Based Contract
PCB	Polychlorinated Biphenyl
Pest	Pesticides
PPE	Personal Protective Equipment
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RAO	Remedial Action Objective
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
RQL	Ramsdell Quarry Landfill
RVAAP	Ravenna Army Ammunition Plant
RVAAP-01	Ramsdell Quarry Landfill
SAIC	Science Applications International Corporation
SAP	Sampling and Analysis Plan
SO	Soil Sample
SS	Surface Soil
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SVOC	Semi-Volatile Organic Compound
SWP3	Storm Water Pollution Prevention Plan
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TCSA	Toxic Substance Control Action
TSD	Treatment, Storage, or Disposal
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound

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1.0 INTRODUCTION

Science Applications International Corporation (SAIC) has been contracted by the U.S. Army Corps of Engineers (USACE), Louisville District, to provide environmental services in support of six high priority areas of concern (AOCs) at the Ravenna Army Ammunition Plant (RVAAP) in Ravenna, Ohio. This Remedial Design (RD) describes the implementation process for the selected remedy at Ramsdell Quarry Landfill (RQL) as stated in the *Record of Decision for Soil and Dry Sediment at Ramsdell Quarry Landfill (RVAAP-01) at the Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2009).

This work is being performed under a Performance Based Contract (PBC) in accordance with U.S. General Services Administration (GSA) Environmental Advisory Services Contract GS-10-F-0076J. In addition, planning and performance of all work elements is being conducted in accordance with the requirements of the Ohio Environmental Protection Agency (Ohio EPA) Director's Final Findings and Orders (DFFO) dated June 10, 2004 (Ohio EPA 2004).

1.1 PURPOSE

The purpose of this RD is to detail implementation of the selected remedial action alternative specified in the *Record of Decision for Soil and Dry Sediment at the Ramsdell Quarry Landfill (RVAAP-01) at the Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2009). This Record of Decision (ROD) specifies remediation (removal) of soil containing chemical contamination at the quarry bottom of RQL exceeding cleanup goals (CUGs) for the most reasonable anticipated land use (Security Guard/Maintenance Worker).

Specific elements of the remedial action described in this RD are as follows:

- Excavate contaminated soil at RQL;
- Transport and dispose of contaminated soil at a permitted facility;
- Confirm risk-based cleanup goals for soil have been attained; and
- Restore excavated areas to neighboring or original contours and conditions.

1.2 SCOPE

The overall program goal of the Installation Restoration Program (IRP) is to clean up previously-contaminated land at RVAAP to an acceptable level of risk as resources and mission requirements allow. RQL is an AOC at RVAAP. This RD addresses chemical contamination in soil at this AOC. Once the remedial action objectives and CUGs are met during the implementation of this RD, soil and dry sediment will be considered protective for the Security Guard/Maintenance Worker. This RD does not address other potentially-contaminated media (e.g., surface water, groundwater, wet sediment).

The scope of this RD is to present a plan to excavate and dispose soil containing contaminant concentrations exceeding CUGs specified in the ROD for RQL. The estimated removal quantity presented in the ROD was 423 cubic yards. Since the time the ROD was developed, characterization and confirmation sampling was performed (as described in Section 4.0 of this RD). Based on the confirmation sampling, the estimated area with average constituent of concern (COC) concentrations greater than CUGs is 43,394 square feet. Given the average depth to bedrock of 7 inches, the removal volume would be 1,608 cubic yards; however, the removal area will be refined through additional sampling prior to remedial actions. Table 1-1 summarizes the most recent estimated quantities of soil that will be removed at RQL.

Table 1-1. Estimated Removal Quantity for Soil

Area of Concern	Volume[a]		Mass[b]
	(cubic feet)	(cubic yards)	(tons)
Ramsdell Quarry Landfill	43,394	1,608	2,573

[a]Volume was calculated assuming an average depth to bedrock of 7 inches.

[b]Mass was calculated assuming a soil density of 1.6 tons per cubic yard.

Remedial activities will be overseen by USACE and implemented by SAIC and the chosen SAIC remedial construction subcontractor (herein referred to as Subcontractor). SAIC (under contract with the USACE) is responsible for the excavation, characterization, and disposal of contaminated soil. Implementation of these activities will meet the requirements of the Facility-Wide Sampling and Analysis Plan (FWSAP) (USACE 2001a), the Facility-Wide Safety and Health Plan (FWSHP) (USACE 2001b), and this RD.

1.3 FACILITY DESCRIPTION

When the RVAAP IRP began in 1989, RVAAP was identified as a 21,419-acre installation. The property boundary was resurveyed by Ohio Army National Guard (OHARNG) over a 2-year period (2002 and 2003) and the total acreage of the property 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 has been transferred to the National Guard Bureau (NGB) and subsequently licensed to OHARNG for use as a military training site.

The current RVAAP consists of 1,280 acres scattered throughout the OHARNG Camp Ravenna Joint Military Training Center, herein referred to as Camp Ravenna. Camp Ravenna is in northeastern Ohio within Portage and Trumbull Counties, approximately 3 miles (4.8 km) east-northeast of the City of Ravenna and approximately 1 mile (1.6 km) northwest of the City of Newton Falls. The RVAAP portions of the property are solely located within Portage County. RVAAP/Camp Ravenna is a parcel of property approximately 11 miles (17.7 km) long and 3.5 miles (5.6 km) 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 (Figures 1-1 and 1-2). Camp Ravenna is surrounded by several communities: Windham on the north; Garrettsville 6 miles (9.6 km) to the northwest; Newton Falls 1

mile (1.6 km) to the southeast; Charlestown to the southwest; and Wayland 3 miles (4.8 km) 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 industrial facility. The RVAAP IRP encompasses investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP. References to RVAAP in this document are considered to be inclusive of the historical extent of RVAAP, which is inclusive of the combined acreages of the current Camp Ravenna and RVAAP, unless otherwise specifically stated.

1.4 RAMSDELL QUARRY LANDFILL DESCRIPTION AND HISTORY

RQL encompasses approximately 14 acres in the northeastern portion of RVAAP. RQL includes old-field communities with patches of forests and grasslands. The land surface in a large portion of the AOC slopes into a former quarry, which occupies most of the AOC (see Figure 1-3). The quarry bottom is about 40 ft below the surrounding area. Former quarry operations resulted in the removal of much of the original soil. Surface water runoff collects in an isolated wetland in the bottom of the former quarry. There is no surface water drainage outlet from the quarry. The extent of the wetland varies widely depending on the season and rainfall and it is sometimes completely dry. When water is present in the wetland, the depth is usually less than 4 ft. The drainage ways and ditch lines outside of the quarry, located along access roads and the rail line in the southern part of the AOC, only contain water during rain events.

RQL was initially a stone quarry that operated until 1941. During operations, the quarry was excavated 30 to 40 ft below existing grade. The excavated sandstone and quartzite pebble conglomerate was used for road and construction ballast. From 1946 to the 1950s, the bottom of the quarry was used to burn waste explosives from Load Line 1. Reportedly, 18,000 500-lb (225-kg) incendiary or napalm bombs were burned and liquid residues from annealing operations were disposed of in the quarry.

Between 1941 and 1989, the western and southern sections of the abandoned quarry were used for landfill operations. No information is available regarding landfill disposal activities from 1941 to 1976, and no information is available on other activities at the quarry from the 1950s to 1976. Only nonhazardous solid waste was deposited in RQL from 1976 until it was closed in 1989. In 1978, a portion of the abandoned quarry was permitted as a sanitary landfill by the State of Ohio. The sanitary landfill was closed in 1990 under State of Ohio solid waste regulations. A clay cap was placed on the former permitted landfill area covering approximately 4 acres of the AOC. The installation and semi-annual monitoring of five groundwater monitoring wells were required as part of Ohio post-closure requirements for the landfill.

1.4.1 Soil and Wet Sediment Delineation

As the ROD addresses only soil and dry sediment, there is importance in defining areas within RQL that are considered wet sediment, soil, and dry sediment.

Dry sediment is considered unconsolidated inorganic and organic material on the surface of the ground that may occasionally be covered with water, usually following a precipitation event. Although it may serve as a natural medium for the growth of terrestrial organisms, dry sediment does not function as permanent habitat for aquatic organisms. Dry sediment is essentially soil that, due to its location, may occasionally be covered with water. Wet sediment is similar in makeup as dry sediment; however, it is covered with water and functions as permanent habitat for aquatic organisms.

The water levels and horizontal extent of water in the quarry bottom of RQL fluctuates during any given year. In February 2008, SAIC conducted an RD "storyboard meeting" with the RVAAP IRP Team, including the Facility Manager, Ohio EPA, USACE, and OHARNG. The IRP Team agreed to use the September 2007 survey results to delineate wet sediment and soil. The areas of the quarry bottom that were underwater during the September 2007 survey were considered wet sediment and are not addressed in the ROD or this RD. The September 2007 waterline is presented in Figure 1-3. The remaining areas were considered dry sediment and soil and will be referred to as "soil" for consistency within this RD.

1.4.2 Soil Depth in Quarry Bottom

To assist in volume estimations during the implementation of the remedial actions, SAIC did a walkover survey of the quarry bottom in May 2009. During this walkover survey, the soil depth to bedrock was measured at multiple, random locations. The soil thickness varied throughout the quarry bottom from locations where bedrock was exposed, to locations that had a soil depth exceeding two feet. The average depth of soil overlying bedrock at the quarry bottom was seven inches. This average depth was used to estimate soil removal quantities within this RD.

1.5 ANTICIPATED FUTURE LAND USE

RQL is currently managed as "restricted access" due to post-closure care and monitoring requirements for the closed sanitary landfill until the year 2040. RQL is closed to all normal training and administrative activities. Surveying, sampling, and essential security, safety, natural resources management, and other directed activities may be conducted at RQL only after personnel have been properly briefed on potential hazards/sensitive areas. The U.S. Army intends to transfer RQL to the NGB once remedial actions are complete. The NGB will subsequently license the land to OHARNG for military use. The OHARNG has established the future land use for RQL as restricted access, no digging.

1.6 PREVIOUS ACTIVITIES

1.6.1 Groundwater Investigations

A groundwater investigation (USACE 1999) was conducted in July 1998, involving: (1) the installation and sampling of six new monitoring wells; (2) sampling of the existing RQL post-closure monitoring well system; (3) sampling of sediment and surface water within the quarry; and (4) construction of a staff gauge within the main quarry pond. The follow-on phase of the investigation, which extended until July 15, 1999, included: (1) quarterly, dry season and wet season (storm event) sampling of the new monitoring well network and quarry pond surface water; (2) collection of long-term water levels from the new monitoring well network and quarry pond; (3) monthly manual water level measurements from all wells and the pond staff gauge; and (4) collection of precipitation data.

Groundwater samples from these two phases contained low but detectable concentrations of nine explosive compounds, associated degradation products, and nitroglycerine. Multiple trace metals were present above facility-wide background criteria, as well as Ohio drinking water standards [maximum contaminant levels (MCLs)] in both filtered and unfiltered samples. The most prevalent metals were aluminum, arsenic, cobalt, manganese, mercury, nickel, and zinc. Sporadic detections of bis(2ethyl-hexyl)phthalate and volatile organic compounds (VOCs) (most commonly toluene and methylene chloride) were noted. VOC concentrations did not exceed MCLs. The upgradient well (RQLmw-006) and two other wells (RQLmw-007 and -008) located at the toe of the landfill typically had the highest percentages of detected contaminants. Water level data collected during the investigations showed that horizontal potentiometric gradients are consistently to the northeast across the site.

1.6.2 Phase I Remedial Investigation

The Phase I Remedial Investigation (RI) (USACE 2005) was performed to determine the nature and extent of contamination in affected media (e.g., surface soils [0 to 1 ft below ground surface (BGS)] and groundwater). Two metals (arsenic and lead) and eight semivolatile organic compounds (SVOCs) [benz(*a*)anthracene; benzo(*a*)pyrene; benzo(*b*)fluoranthene; benzo(*k*)fluoranthene; carbazole; chrysene; dibenz(*a,h*)anthracene; and indeno(*1,2,3-cd*)pyrene] were identified as COCs in shallow surface soil (0 to 1 ft BGS) for the Security Guard/Maintenance Worker at RQL. The highest concentrations for all eight SVOCs were detected in the northwest corner of the quarry bottom.

Total carcinogenic risk to a Security Guard/Maintenance Worker was calculated as 2.1E-03, which exceeds Ohio EPA target risk levels of 1E-05. Exposure point concentrations (EPCs) for five COCs did not exceed their respective CUGs [arsenic, lead, benzo(*k*)fluoranthene, carbazole, and chrysene] and they were not considered further for evaluation. The EPCs for the remaining five COCs [benz(*a*)anthracene; benzo(*a*)pyrene; benzo(*b*)fluoranthene; dibenz(*a,h*)anthracene; and indeno(1,2,3-*cd*)pyrene] did exceed CUGs and were considered for remediation.

1.6.3 Feasibility Study

Preliminary CUGs for soil for the Security Guard/Maintenance Worker and Resident Subsistence Farmer land use were developed in the *Feasibility Study for Ramsdell Quarry Landfill (RVAAP-01) at the Ravenna Army Ammunition Plant* (USACE 2006) to support the remedial alternative selection process for soil remediation at RQL. A summary of the preliminary CUGs for the COCs identified for evaluation of remedial alternatives for the Security Guard/Maintenance Worker is provided below in Table 1-2.

Table 1-2. Feasibility Study Preliminary Cleanup Goals for Ramsdell Quarry Landfill Soil (Security Guard/Maintenance Worker)

Constituent of Concern	Preliminary Cleanup Goal (mg/kg)
Representative Land Use (Restricted Access – Security Guard/Maintenance Worker)	
Benz(a)anthracene	13
Benzo(a)pyrene	1.3
Benzo(b)fluoranthene	13
Dibenz(a,h)anthracene	1.3
Indeno(1,2,3-cd)pyrene	13

mg/kg = Milligrams per Kilogram

Remedial alternatives were evaluated for contaminated soil at RQL. The remedial alternatives were selected by combining general response actions, technology types, and process options retained from the screening processes described in the previous section. Remedial alternatives assured adequate protection of human health and the environment, achieved Remedial Action Objectives (RAOs), met Applicable and Relevant or Appropriate Requirements (ARARs), and permanently and significantly reduced the volume, toxicity, and/or mobility of COCs.

The recommended remedial alternative for RQL, as presented in the Feasibility Study (FS), was Excavation of Soil with Offsite Disposal ~ Security Guard/Maintenance Worker. This alternative removes soil in the quarry bottom at RQL that exceeds CUGs for the anticipated future land use (Security Guard/Maintenance Worker).

1.6.4 Community Involvement and Regulatory Approval

The *Proposed Plan for Soil and Dry Sediment at the Ramsdell Quarry Landfill (RVAAP-01)* (USACE 2007) was presented to the public on April 4, 2007. A 30-day public comment period was conducted until May 3, 2007. A public meeting was held presenting the recommended alternative on April 10, 2007 in Newton Falls, Ohio. Comments were collected and incorporated into a ROD.

The *Record of Decision for Soil and Dry Sediment for the Ramsdell Quarry Landfill (RVAAP-01)* (USACE 2009) documented the selected remedial action alternative to excavate and dispose soil and dry sediment from the quarry bottom until the remedial action CUG (presented in Section 3.0 of this

RD) was achieved. The ROD includes a Responsiveness Summary addressing public comments received during the public comment period and public meeting. Ohio EPA concurred with the Final RQL ROD on May 08, 2009 and was signed by the Director of the Ohio EPA on October 13, 2009.

1.7 REMEDIAL DESIGN ORGANIZATION

This RD is comprised of a work plan, design drawings, and specifications. The work plan is organized as follows:

Section 2: Presents the project organization and coordination;
Section 3: Outlines the remedial action objectives;
Section 4: Describes the soil waste characterization and confirmation sampling;
Section 5: Provides the permitting notification requirements;
Section 6: Discusses construction mobilization and site preparation;
Section 7: Describes soil remedial activities;
Section 8: Presents the procedures to confirm completion of remedial activities;
Section 9: Summarizes site restoration activities;
Section 10: Discusses waste characterization and disposal activities;
Section 11: Presents the Construction Quality Assurance Plan (CQAP); and
Section 12: Lists the references used in the document.

Attachments:

A. Site Safety and Health Plan (SSHP)
B. Storm Water Pollution Prevention Plan (SWP3)
C. Design Drawings
D. Construction Forms and Checklists
E. Land Use Controls for Soil and Dry Sediment at the RVAAP-01 Ramsdell Quarry Landfill

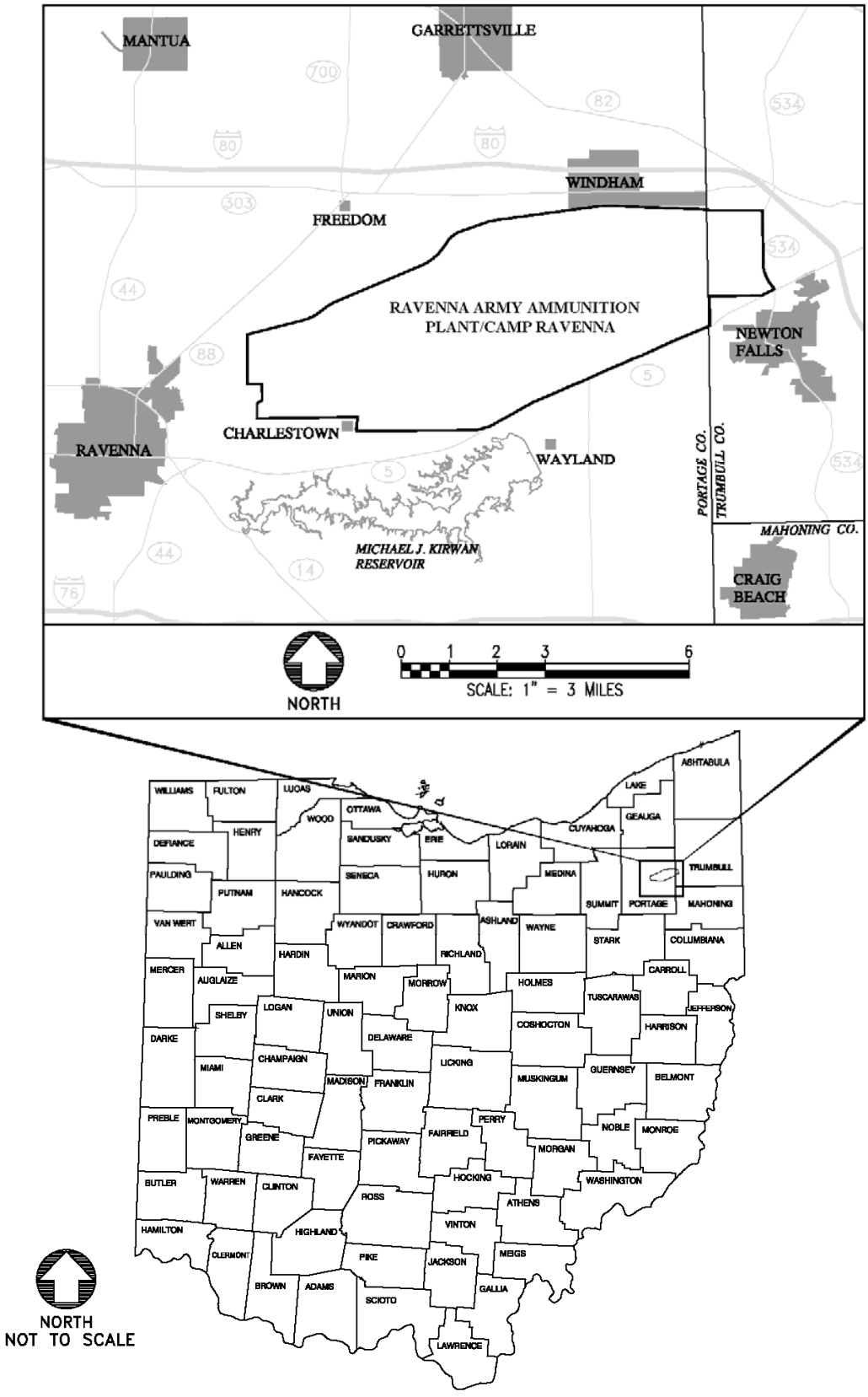

Figure 1-1. General Location and Orientation of RVAAP/Camp Ravenna

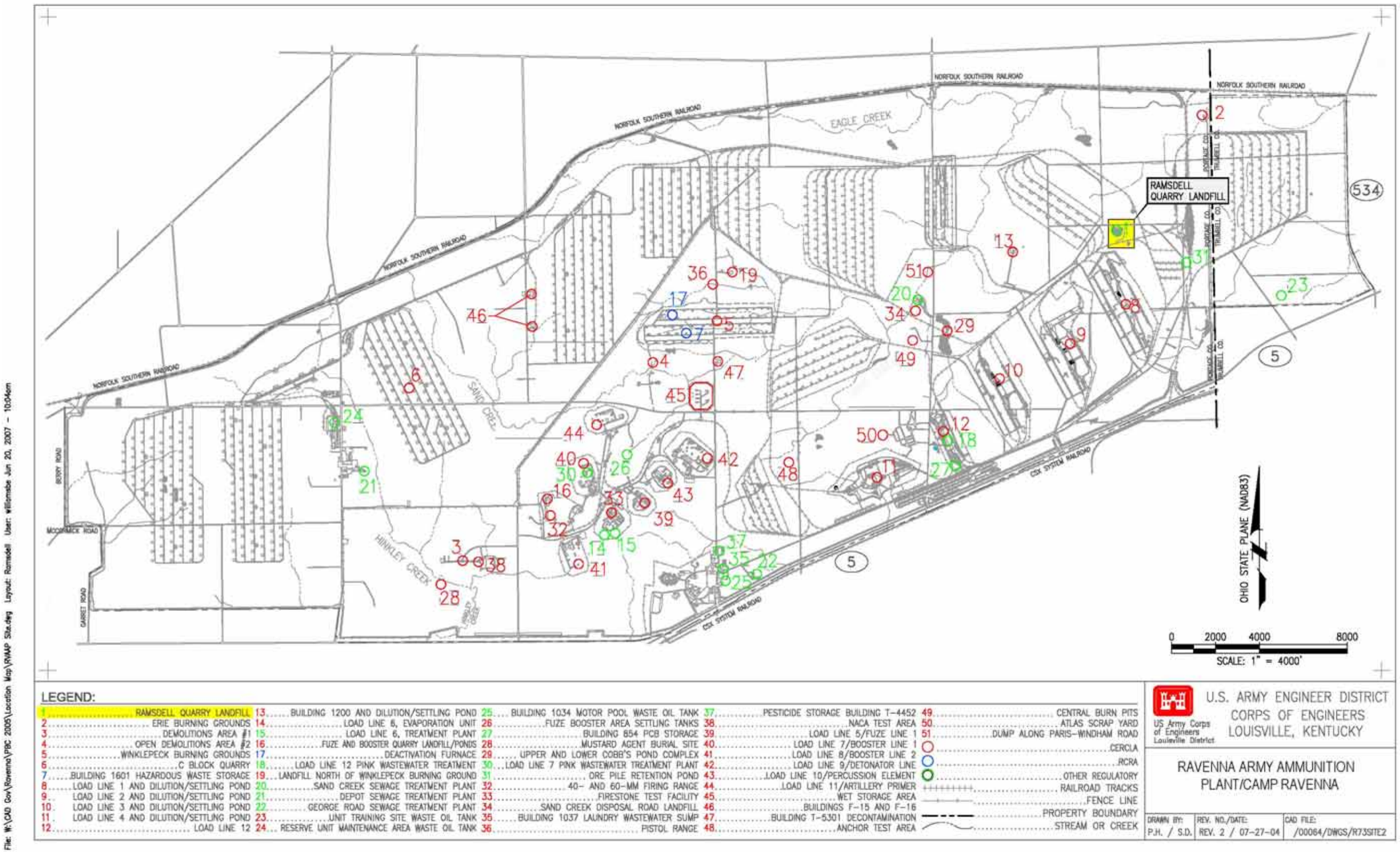

Figure 1-2. RVAAP/Camp Ravenna Installation Map

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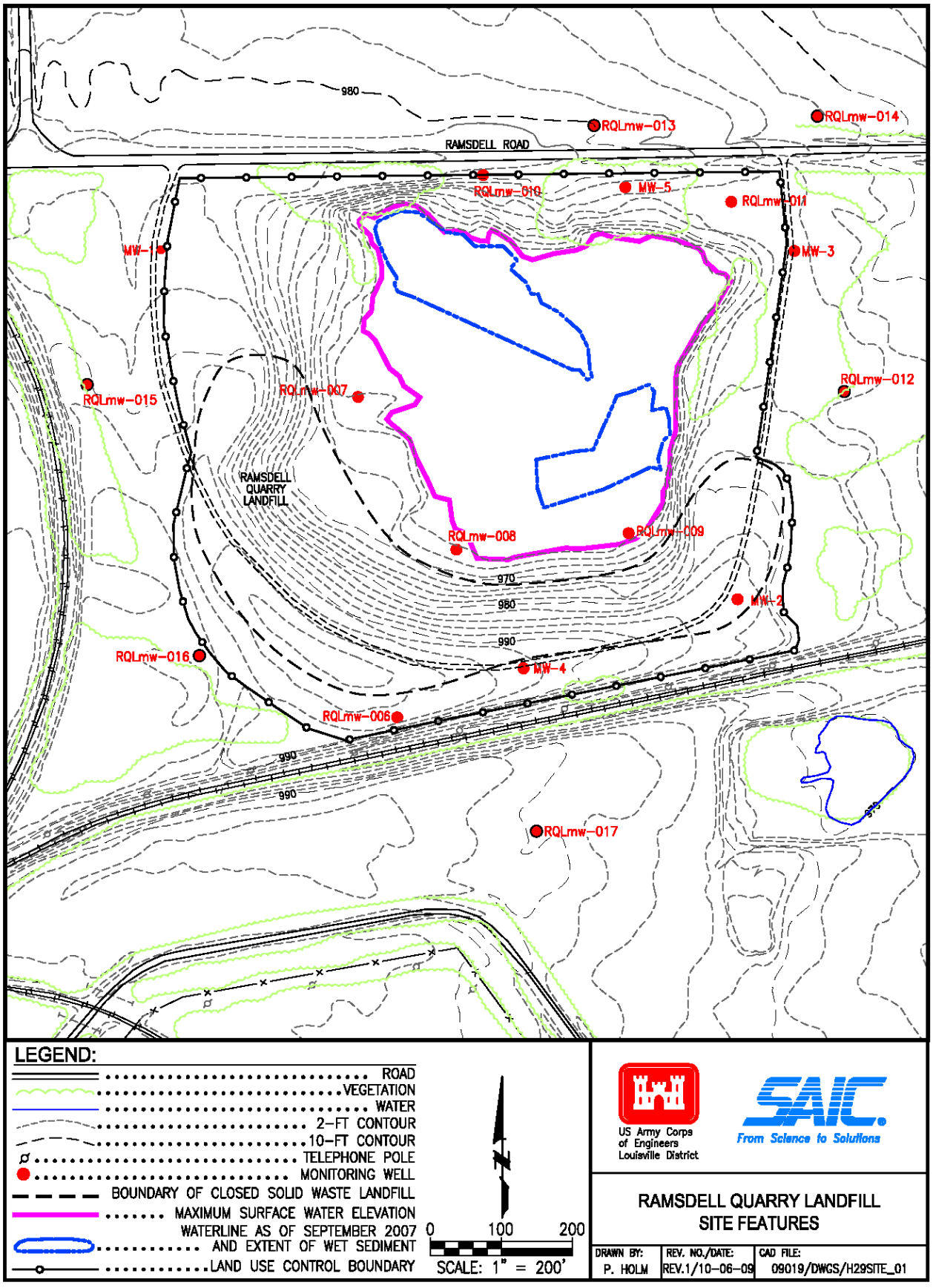

Figure 1-3. Features of Ramsdell Quarry Landfill

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2.0 PROJECT ORGANIZATION AND COORDINATION

This section presents the project organization and describes the project team coordination. This section also describes monthly reporting and participation in weekly contractor meetings at the RVAAP by SAIC.

2.1 PROJECT ORGANIZATION

The U.S. Army is the lead agency for this remedial action and is responsible for implementation. The USACE Louisville District has implementation and technical oversight responsibility on behalf of the U.S. Army. Ohio EPA is the regulatory authority governing work on this remedial action. SAIC is the primary contractor responsible for implementing this RD. SAIC will select and procure a qualified Subcontractor to excavate, transport, and dispose of contaminated soil. An organizational chart for implementation of the RD is presented in Figure 2-1. Key personnel responsibilities are summarized below.

2.1.1 USACE Contracting Officer's Representative

The USACE Contracting Officer's Representative (COR) duties include overseeing SAIC to ensure work is completed in accordance with this RD. The USACE COR also coordinates responses for any unexpected materials encountered.

2.1.2 RVAAP Facility Manager

The RVAAP Facility Manager is responsible to sign waste profiles, manifests, and necessary permits. The RVAAP Facility Manager will also assist in the coordination between SAIC and the RVAAP Operations and Maintenance Contractor (Vista Sciences Corporation).

2.1.3 Ohio EPA Project Coordinator

The Ohio EPA Project Coordinator will oversee the implementation of this RD and will verify all work completed by SAIC and the Subcontractor meets regulatory requirements. The Ohio EPA Project Coordinator will be informed of project schedule and implementation deviations.

2.1.4 SAIC Project Manager

The SAIC Project Manager administers the management, implementation, and quality of this RD and remedial action. The Project Manager provides oversight to ensure all contractual requirements are properly satisfied. This individual ensures all project goals and objectives are met in a high-quality and timely manner. The Project Manager is responsible for tracking project schedule and informing the USACE COR and Ohio EPA Project Coordinator of any deviations to the project schedule. The Project Manager provides the Ohio EPA Project Coordinator with notification of project

implementation and information regarding any quality assurance and non-conformance issues for this remedial action.

2.1.5 SAIC Technical Manager

The SAIC Technical Manager manages the technical performance and quality of the remedial action. The Technical Manager oversees the SAIC Construction Manager in meeting project goals and objectives in a high quality and timely manner and reports to the SAIC Project Manager. In coordination with the SAIC Construction Manager and the SAIC Quality Assurance/Quality Control (QA/QC) Officer, the SAIC Technical Manager addresses issues including identification of non-conformances and confirmation of achieving CUGs. Dependant upon the project complexity and effort required, the SAIC Technical Manager and SAIC Construction Manager may be the same person.

2.1.6 SAIC Quality Assurance/Quality Control Officer

The SAIC QA/QC Officer coordinates with the SAIC Construction Manager to ensure the requirements of the RD CQAP and Facility-Wide Quality Assurance Project Plan (QAPP) are achieved and ensures inspections are performed in accordance with both plans.

The SAIC QA/QC Officer also provides quality control of sampling and sample handling (including sample custody, field testing, and coordinating QA/QC of the laboratory) and ensures the required submittals are on time and of high quality. The SAIC QA/QC Officer is responsible for reviewing and approving variances during field activities before work continues; approving, evaluating, and documenting the disposition of Non-Conformance Reports (NCRs); and designing and supervising the implementation of audit/surveillance plans. The SAIC QA/QC Officer reports directly to the SAIC Project Manager and informs the SAIC Program Manager and SAIC Construction Manager of all information and decisions reported.

2.1.7 SAIC Health and Safety Manager

The SAIC Health and Safety Manager establishes health and safety policies and procedures supporting project and office activities, and verifies safe work practices and conditions. The SAIC Health and Safety Manager ensures these policies are, at a minimum, in accordance with the FWSHP (USACE 2001b), as well as AOC-specific addenda and explosive safety submissions (ESSs) if applicable. The SAIC Health and Safety Manager reports directly to the SAIC Project Manager and will inform the SAIC Technical Manager and SAIC Construction Manager of all information and decisions reported.

2.1.8 SAIC Construction Manager

The SAIC Construction Manager, also serving the role as appropriate to the Field Operations Manager as defined in Section 3.4 of the FWSAP (USACE 2001a), is responsible for project control

and implementation of remedial activities in accordance with this RD. The SAIC Construction Manager is responsible for subcontractor oversight, adherence to QA/QC field procedures and the SSHP (and ESS, if applicable), coordination with RVAAP personnel and the USACE COR, management of any investigation-derived wastes (IDW), field documentation, and preparation of field change orders, if required. Should separate construction and technical management positions be necessary, the SAIC Construction Manager will report directly to the SAIC Technical Manager.

2.1.9 Subcontractor Construction Supervisor

The Subcontractor Construction Supervisor implements specific contracted components of this RD. The Subcontractor Construction Supervisor is responsible for the proper performance of specified remedial activities in accordance with this RD, adherence to QA/QC field procedures and the CQAP, implementation of the SSHP (and ESS, if applicable), coordination of field personnel activities, and field documentation. The Subcontractor Construction Supervisor reports directly to the SAIC Construction Manager.

2.1.10 Subcontractor Site Safety and Health Officer

The Subcontractor Site Safety and Health Officer (SSHO) is responsible for implementation and adherence of the Site Safety and Health Plan (SSHP) [Attachment A] and applicable components of the ESS, if required. The SSHO will verify and approve that specified health and safety procedures outlined in the SSHP adequately protect on-site personnel during field activities. The SSHO will ensure that health and safety procedures are modified to meet changing needs, if required. The SSHO will also ensure all on-site personnel (including visitors) strictly adhere to the SSHP throughout the field activities conducted for the duration of the project. The SSHO reports to the Subcontractor Construction Supervisor and the SAIC Construction Manager.

2.1.11 MEC Avoidance Subcontractor

The Munitions and Explosives of Concern (MEC) Avoidance Subcontractor is responsible for ensuring that MEC is either avoided during remedial activities or that appropriate measures are taken if MEC is encountered. An ESS was developed in the event that MEC is encountered in the removal area. If MEC is encountered, the ESS outlines the correct precautions and field personnel to provide the MEC clearance and avoidance.

2.2 MONTHLY REPORTS

A summary of field activities for this remedial action will be included in monthly reports issued per the *Project Management Plan for the Six High Priority Areas of Concern* (SAIC 2005). The monthly reports will include a status and summary of project activities.

2.3 WEEKLY CONTRACTOR MEETING

SAIC will participate in the RVAAP weekly coordination meetings beginning one week prior to remedial activities and extending for the duration of field construction. The Subcontractor may participate in these meetings on an as-needed basis. These weekly coordination meetings are typically held on Mondays in RVAAP Building 1037.

2.4 BI-WEEKLY SCHEDULE CALLS

SAIC will participate in bi-weekly teleconferences with the Ohio EPA and the U.S. Army per the *Project Management Plan for the Six High Priority Areas of Concern* (SAIC 2005). SAIC will communicate the progress of remedial action at this meeting.

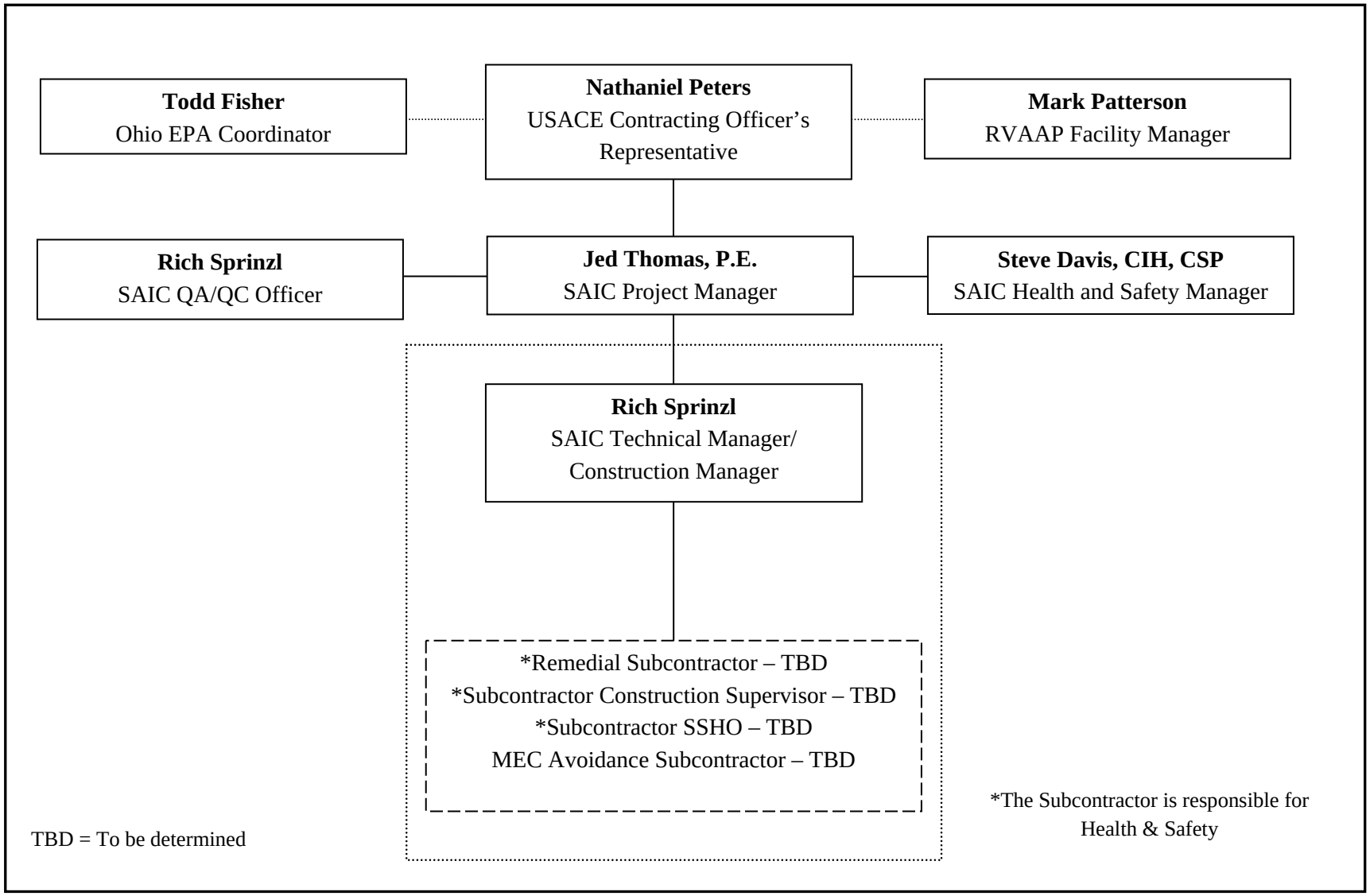

Figure 2-1. Organizational Chart for Implementation of the Remedial Design

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3.0 REMEDIAL ACTION OBJECTIVES AND CLEANUP GOALS

This section describes the RAOs and CUGs for the selected remedy. RAOs specify the requirements the remedial action must fulfill to protect human health and the environment under current and reasonably anticipated future land use scenarios. The CUGs are the contaminant concentrations required to achieve the RAOs.

3.1 REMEDIAL ACTION OBJECTIVE

The RAO for RQL is to prevent the Security Guard/Maintenance Worker from being exposed to contaminants in soil that exceed CUGs. The selected remedy will address soil to a depth of 1 ft BGS given the current and future land uses and should not disturb soil below that depth.

3.2 REMEDIAL ACTION CLEANUP GOAL

Table 3-1 presents the chemicals that have an exposure point concentration (EPC) exceeding the CUGs for the Security Guard/Maintenance Worker. Based on the risk evaluation, soil within the quarry bottom requires remediation. Soils exceeding the CUGs presented in Table 3-1 will be removed in accordance with the RD.

Table 3-1. COCs and Cleanup Goals for a Security Guard/Maintenance Worker for Soil at RQL[a]

COC[b]	EPC (mg/kg)	Cleanup Goal (mg/kg)
Benz(*a*)anthracene	260	13
Benzo(*a*)pyrene	180	1.3
Benzo(*b*)fluoranthene	220	13
Dibenz(*a*,*h*)anthracene	33	1.3
Indeno(1,2,3-*cd*)pyrene	116	13

[a]Surface soil (0-1 ft BGS) is used for Security Guard/Maintenance Worker.
[b]Total carcinogenic risk to a Security Guard/Maintenance Worker from contaminants in the quarry bottom was calculated as 1E-05.
COC = Constituent of concern
EPC = Exposure Point Concentration
RQL = Ramsdell Quarry Landfill
mg/kg = Milligrams per Kilogram

LUCs with respect to chemical contamination in soil will be required because remedial action CUGs for the Resident Subsistence Farmer will not be achieved. These LUCs are presented in Attachment E.

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4.0 WASTE CHARACTERIZATION AND CONFIRMATION SAMPLING

On May 15, 2009, SAIC conducted waste characterization and confirmation sampling of the soil within the quarry bottom at RQL. The objectives of the sampling event included the following:

1. Determine if excavated soil will be considered nonhazardous or hazardous waste;
2. Perform confirmation sampling to meet the sampling requirements of the ROD; and
3. Assist in estimating quantities of soil requiring disposal to achieve CUGs.

The results of the waste characterization sampling indicate the soil is nonhazardous. This section presents interpretation of this data. However, the determination of nonhazardous will ultimately be made by the subcontracted off-site disposal facility.

The confirmation sampling objective for soil at RQL was to re-assess multi-increment (MI) sample areas sampled in 2003. As stated in Section L.2 of the ROD:

> *"These additional confirmation samples will be collected to re-assess the multi-increment (MI) sampling performed during the 2003 Phase I RI field investigation. The samples collected during the 2003 Phase I RI were intended to evaluate the feasibility of sampling method instead of quantitative evaluation of contaminant nature and extent. Results from four of the 2003 MI samples indicated benzo(a)pyrene above the clean-up goal of 1.3 mg/kg. The SVOC laboratory reporting limits for the 2003 MI samples were set about 4 mg/kg because of the intended use of the data at the time, which is substantially higher than the clean-up goals for these chemicals. All of the 2003 results greater than clean-up goals were estimated values less than the reporting limit. Laboratory analyses for the planned confirmation samples will have lower reporting limits more suitable for comparison to the clean-up goals."*

The confirmation sampling and re-assessment was completed during the June 2009 soil sampling effort. To meet the requirements of the ROD, the quarry bottom was re-surveyed to establish the five MI sample areas as originally presented in Figure 3-1 of the *Phase I Remedial Investigation Report for the Ramsdell Quarry Landfill* (USACE 2005). Additionally, two MI sample areas were surveyed to encompass the modeled contaminated areas as presented in Figure 3 of the *Record of Decision for Soil and Dry Sediment for the RVAAP-01 Ramsdell Quarry Landfill* (USACE 2009). These seven MI sample areas are presented in Figure 4-1 of this RD. MI samples were collected from the soil in these areas and were analyzed for the COCs presented in Section 3.0 of this RD. The MI sample areas having chemical concentrations exceeding CUGs for the Security Guard/Maintenance Worker will require soil removal; however, further sampling will be conducted in MI areas RQL-034M and RQL-037M (as described in Section 4.5) to further refine the extent of the contaminated area requiring removal.

4.1 CHARACTERIZATION SAMPLE PROCEDURES AND COLLECTION

SAIC field personnel collected both MI and discrete characterization samples from the seven MI sample areas (RQL-034M thru RQL-040M) at the bottom of RQL. Procedures for sampling were presented in the *Technical Memorandum to Conduct Remedial Design Soil Sampling at RVAAP-01 Ramsdell Quarry Landfill, RVAAP-12 Load Line 12, and RVAAP-16 Fuze and Booster Quarry Landfill/Ponds* (issued to USACE, Ohio EPA, and OHARNG on April 1, 2009) and are further described in the following subsections.

4.1.1 Multi-Increment Soil Sampling Procedures

An MI sample is a combined sample of multiple aliquots collected from random points in a sample area. Aliquots of soil were collected from random sample points within each of the seven sample areas at RQL. Prior to sample collection, the random points were flagged within each sample area to designate where aliquots would be collected. A minimum of 30 random points were chosen, which provided a 95% statistical confidence level that the sample result represented the average concentration for the sample area.

At each of these random sample points, a decontaminated 1-inch diameter soil probe was used to collect soil aliquots to 1 ft BGS or until bedrock was encountered. The aliquots were collected in a decontaminated stainless-steel bowl. Once all the aliquots were collected, the soil was placed into a container for transport to a National Environmental Laboratory Accreditation Conference (NELAC) approved off-site laboratory. As part of the MI sample process, the laboratory dried, sieved, and finely ground the sample prior to analysis.

Photograph 4-1. Multi-Increment Sample Collection

4.1.2 Discrete Soil Sampling Procedures

MI sampling and processing was not performed for soil analyzed for VOCs. The sample collection and preparation process volatizes the compounds; therefore, the resulting VOC concentration reported by the laboratory will not be representative of the VOC concentration in soil. Consequently, discrete soil samples were collected for VOC analysis.

For discrete soil sampling, one soil sampling location was chosen to be representative of the quarry bottom with respect to VOC concentrations. This sample was extracted using a decontaminated soil probe. The soil sample was placed directly into a sample jar and sealed to minimize volatilization. This sample was transported to a NELAC-approved off-site laboratory, but did not undergo drying, sieving, and grounding prior to analysis.

4.2 WASTE CHARACTERIZATION SAMPLING

To determine the waste characteristics (i.e., nonhazardous or hazardous) of the soil at the bottom of RQL, MI and discrete soil samples were collected from RQL-039M (shown in Figure 4-1). RQL-039M is the FS modeled extent of contamination determined from the discrete soil sample RQL-026 (shown in Figure 4-1) collected during the Phase I Remedial Investigation (USACE 2005). This area was conservatively chosen to be representative of all soils at the bottom of RQL because RQL-026 had the highest concentrations for the COCs during the Phase I RI.

One MI sample was collected from RQL-039M and analyzed for toxicity characteristic leaching procedure (TCLP) metals, TCLP SVOCs, TCLP pesticides, TCLP herbicides, reactive cyanide, reactive sulfide, and polychlorinated biphenyls (PCBs). One discrete sample was collected from the middle of RQL-039M and was analyzed for TCLP VOCs.

4.3 CHARACTERIZATION SAMPLE IDENTIFICATION

Table 4-1 presents the specific sample identification information used during the sampling effort.

Table 4-1. Sample Identification for Waste Characterization Sampling

Location[a]	Sample ID	SVOCs (Total)	TCLP[b] (VOCs)	TCLP (SVOCs, Metals, Pest, Herb)	Reactive Cyanide, Sulfide, and PCBs
RQL-034M	RQLss-034M-1076-SO	1	0	0	0
RQL-035M	RQLss-035M-1077-SO	1	0	0	0
RQL-036M	RQLss-036M-1078-SO	1	0	0	0
RQL-037M	RQLss-037M-1079-SO	1	0	0	0
RQL-038M	RQLss-038M-1080-SO	1	0	0	0
RQL-039M	RQLss-039M-1081-SO	1	0	1	1
RQL-039M	RQLss-039M-1081-FD	1	0	0	0
RQL-039M	RQLss-039-1083-SO	0	1	0	0
RQL-040M	RQLss-040M-1082-SO	1	0	0	0

Additional parameters (e.g., paint filter test) may be required by the waste disposal facility. The waste disposal facility has not been selected at the time of this design.

[a]Locations are depicted on Figure 4-1.

[b]Samples analyzed for VOCs were collected as discrete samples and did not undergo laboratory multi-increment (MI) processing (particle size reduction).

FD = Field Duplicate
Herb = Herbicides
PCB = Polychlorinated Biphenyl
Pest = Pesticides
RQL = Ramsdell Quarry Landfill
SS = Surface Soil
SO = Soil Sample
SVOC = Semi-Volatile Organic Compound
TCLP = Toxicity Characteristic Leaching Procedure
VOC = Volatile Organic Compound

4.4 RESULTS AND CONCLUSIONS

This section presents the results and discusses the conclusions of the waste characterization and confirmation sampling.

4.4.1 Waste Characterization Results and Conclusions

Results from the samples collected at RQL-039M to determine the waste characterization data include:

1. All TCLP metals, VOCs, SVOCs, herbicides, cyanide, and sulfides were either nondetectable or below the reporting limits.

2. PCB concentrations were nondetectable with the exception of Aroclor-1254. Aroclor-1254 had a concentration of 0.061 mg/kg, which is below the Toxic Substance Control Action (TSCA) level of 25-50 mg/kg that would require re-classification of the waste.

3. The pH of the sample was 7.2 standard units.

Based on these data, the excavated soil from the bottom of RQL would be classified as nonhazardous waste and this RD will assume off-site disposal as such. As noted in a previous section, the final classification of the soil for disposal will be verified by the licensed disposal facility and documented on the appropriate waste profile during the remedial action procurement process.

4.4.2 Confirmation Sampling Results and Conclusions

The concentrations of the COCs from the seven MI areas are presented in Table 4-2. Below is the summary of the sampling data.

1. Concentrations of COCs within MI areas RQL-035M, RQL-036M, and RQL-038M were below the CUGs. No remedial actions or further investigations in these areas are necessary.

2. MI sample areas RQL-034M, RQL-037M, RQL-039M, and RQL-040M had at least one chemical with a concentration above the CUG and therefore would require removal or additional sampling to further refine contamination within the MI sample areas.

This remedial design will provide a plan to remove MI areas RQL-034M, RQL-037M, RQL-039M, and RQL-040M. However, additional sampling is planned to further refine the excavation extents at the bottom of RQL. Adjustments to the removal extent of soil will be proposed and reviewed during implementation of this RD. If the adjustments are approved, the changes will be documented and included in the construction report.

Table 4-2. Concentrations of COCs in RQL Confirmation Samples, June 2009

Chemical	CUG (mg/kg)	MI Sampling Area Results (mg/kg)							
		RQL-034M	RQL-035M	RQL-036M	RQL-037M	RQL-038M	RQL-039M		RQL-040M
		RQLss-034M-1076-SO	RQLss-035M-1077-SO	RQLss-036M-1078-SO	RQLss-037M-1079-SO	RQLss-038M-1080-SO	RQLss-039M-1081-SO	RQLss-039M-1081-FD (dup)[1]	RQLss-040M-1082-SO
benzo(a)anthracene	13	13	0.17	1.5	5.7	0.11	3.7	4.8	100
benzo(b)fluoranthene	13	16	0.23	1.9	6.2	0.15	4.3	5.6	110
benzo(a)pyrene	1.3	11	0.13	1.3	4.5	0.095	3	3.8	83
dibenz(a,h)anthracene	1.3	1.6	0.027	0.27	0.71	0.016	0.5	0.61	13
indeno(1,2,3-cd)pyrene	13	5.2	0.074	0.76	2.2	0.055	1.5	1.8	37

[1] A field duplicate (or replicate sample) was collected in the field and submitted to the laboratory as separate sample. Field duplicates are a quality control method to assess precision for the entire measurement system including sampling, handling, shipping, storage, preparation and analysis. Laboratory data precision analysis is evaluated through the use of matrix spike/matrix spike duplicate sample results.

Gray box indicates concentration exceeds cleanup goal.

COC = Constituent of Concern
CUG = Cleanup Goal
Dup = Duplicate Sample
FD = Field Duplicate
mg/kg = Milligrams per Kilogram
M = Multi-Increment
RQL = Ramsdell Quarry Landfill
SO = Soil Sample
SS = Surface Soil

4.5 ADDITIONAL CONFIRMATION SAMPLING

Additional confirmation sampling will be conducted for surface soil within MI areas RQL-034M and RQL-037M. RQL-034M and RQL-037M were divided into approximately 1/5-acre MI sample sub-areas to further refine COC concentrations and extent of soil to be excavated. The MI sample sub-areas are depicted in Attachment C, Drawing C-5. Additional samples will not be collected from within the MI sample areas RQL-039M and RQL-040M, as these two MI sample areas are sufficiently delineated and were previously identified as requiring soil removal.

The MI samples will be collected as described in Section 4.1.1. These samples will be analyzed for the COCs presented in Section 3.0. If the sample results have concentrations exceeding the CUG for any of the five COCs, the respective MI sample sub-area will undergo soil remediation as described in this RD. If the MI sample results are below the CUG for each of the five COCs, the MI sample sub-area will not require soil remediation.

4.5.1 Sample Identification

Specific sample-identifying information that will be used during the project is presented in Figure 4-2. The samples collected will be considered soil samples. Samples will be identified sequentially using the identification number system consistent with the remedial investigations. If a sample is not collected or is reassigned to a different location, a specific reason and notation will be recorded in the project field books.

Table 4-3 presents the baseline sample identification listing.

Table 4-3. Sample Identification for Additional Refinement Sampling

MI Sample Area	Sample ID	SVOCs[a]
RQL-041M	RQLss-041M-####-SO	1
RQL-042M	RQLss-042M-####-SO	1
RQL-043M	RQLss-043M-####-SO	1
RQL-044M	RQLss-044M-####-SO	1
RQL-045M	RQLss-045M-####-SO	1
RQL-046M	RQLss-046M-####-SO	1
RQL-047M	RQLss-047M-####-SO	1
RQL-048M	RQLss-048M-####-SO	1

[a]The SVOCs that will be analyzed will be those with cleanup goals as presented in Section 3.0 of this RD. These SVOCs are benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene.
= The sequential sample identification number will be determined prior to the sampling event.
M = Multi-Increment
RQL = Ramsdell Quarry Landfill
SO = Soil Sample
SS = Surface Soil
SVOC = Semi-Volatile Organic Compound

4.5.2 Sampling and Analysis Requirements

The sampling and analysis requirements are summarized in Table 4-4. This table presents the anticipated sample numbers, QA sample frequencies, and field QC frequencies.

Table 4-4. Sampling and Analytical Requirements for RQL Additional Confirmation Samples

Parameter	Methods	Field Samples	Field Duplicate Samples	Site Source Water	Sampler Rinsates	Trip Blanks	Total A-E Samples	USACE QA Split Samples	USACE Trip Blanks
SVOCs	SW-846 8270C	9	1	0	0	0	10	0	0

A-E = Architect-Engineer
QA = Quality Assurance
RQL = Ramsdell Quarry Landfill
SVOC = Semi-Volatile Organic Compound
USACE = U.S. Army Corps of Engineers

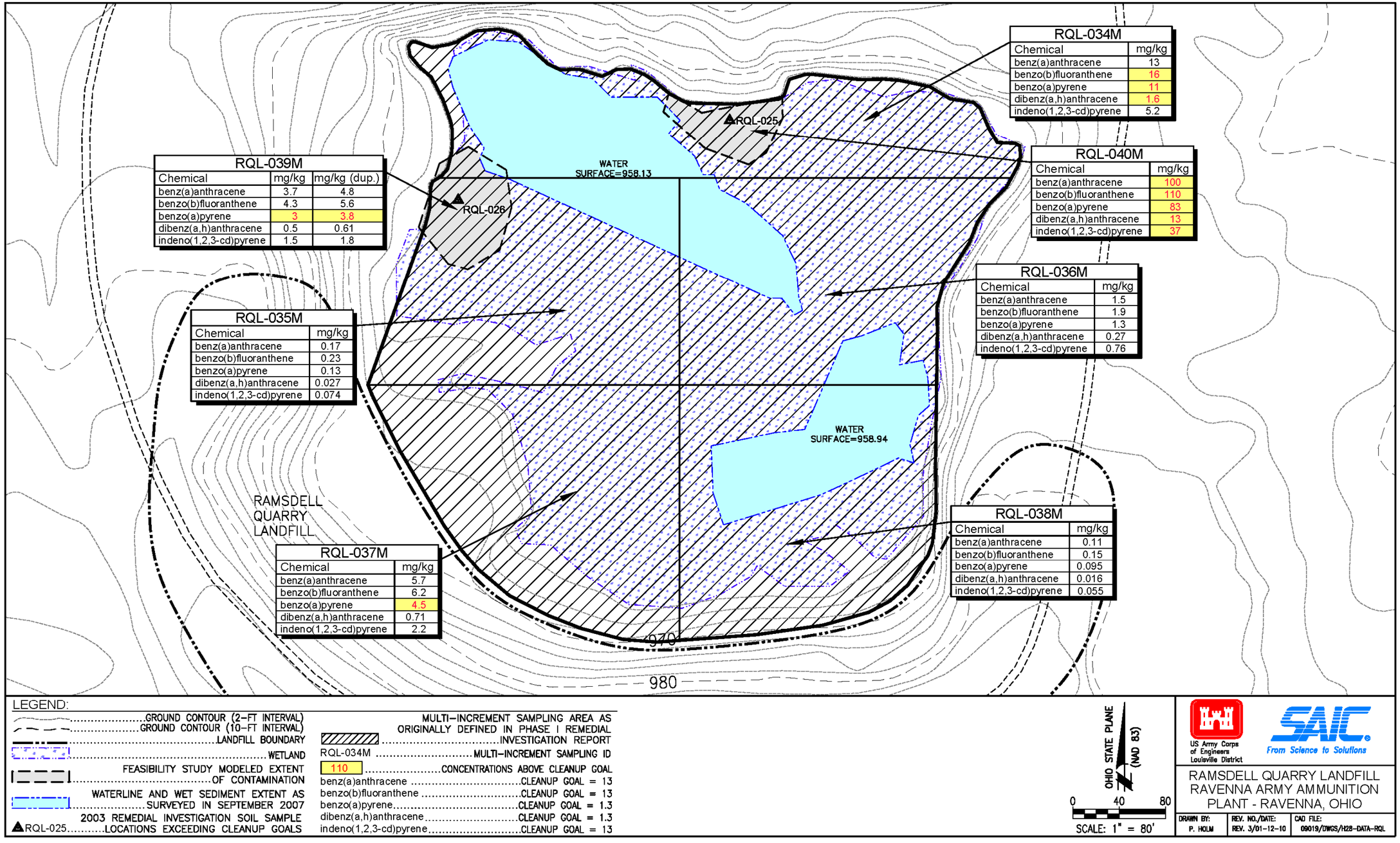

Figure 4-1. RQL Quarry Bottom Characterization Sampling for Volume Estimation

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Sample Station Location Identification: XXXmm-NNN(n)-####-tt

XXX = Area Designator
RQL = Ramsdell Quarry Landfill

mm = Sample Location Type
ss = Surface Soil Sample Location

NNN = Sequential Sample Location Number
Unique, sequential number for each sample location beginning with Phase I RI stations and extending into any subsequent investigative phases (i.e., 001 – 999)

(n) = Special Identifier
Optional use (as needed) to identify special sample matrices or sample location characteristics
M = Multi-Increment Sample

= Sequential Sample Identification Number
Unique, sequential number for each sample beginning with Phase I RI locations and extending into any subsequent investigative phases (i.e., 0001 – 9999)

tt = Sample Type
SO = Soil Sample

Figure 4-2. Sample Identification System

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5.0 PERMIT NOTIFICATION REQUIREMENTS

Based on review of applicable requirements, the following permits and notifications are required for the remedial action:

- Letter of Determination to the U.S. Fish and Wildlife Service;
- Submittal of State of Ohio Historic Preservation Office Project Summary Form;
- Ohio EPA requirements for Isolated Wetlands; and
- Submittal and approval of the SWP3 (Attachment B) to the Portage County Soil and Water Conservation District.

SAIC and the Subcontractor are responsible for meeting all permitting requirements per the State of Ohio and the federal government. SAIC and the Subcontractor will prepare all signatory documentation (e.g., permits and notifications) and submit to RVAAP or USACE representatives for review. Waste profiles and manifests will be signed by the RVAAP Facility Manager.

5.1 ENDANGERED SPECIES PROTECTION

Section (h) *Endangered Species Protection* of 40 *Code of Federal Regulations (CFR)* 6.302 prohibits federal agencies from jeopardizing threatened or endangered species or adversely modifying habitats essential to their survival. The U.S. Fish and Wildlife Service office in Reynoldsburg, Ohio will be informed of the remedial activities prior to mobilization. The notification will state the implementation of this RD will have no impact on federally-endangered or threatened species. The U.S. Fish and Wildlife Service must approve the remedial activities prior to any implementation.

A site-wide Indiana bat survey was conducted at Camp Ravenna in January 2005 and was documented in the *Training Site-Wide Survey for the Indiana Bat (Myotis sodalis) at the Ravenna Training and Logistics Site, Portage and Trumbull Counties, Ohio, Final Report* (ESI 2005). The survey identified six species of bats at Camp Ravenna but did not identify any Indiana bats.

The OHARNG has also completed extensive flora and fauna surveys which have included surveying the Mitchell satyr butterfly (federally endangered), northern monkshood (federally threatened), and eastern massasauga (federal candidate). No federally listed species have been identified at Camp Ravenna.

5.2 PROTECTION OF HISTORIC PROPERTIES

RQL is considered highly disturbed by past construction activity. However, the Ohio Historic Preservation Office (OHPO) will be informed of the remedial activities prior to mobilization. The notification will state the implementation of this RD will have no effect on historic properties. The OHPO must concur with this determination prior to any implementation.

With any ground disturbing activity there is always the potential of an inadvertent discovery of human remains or funerary objects. If such items are encountered during the remedial action, excavation will immediately stop and the OHARNG Cultural Resources Manager (CRM)/Environmental Office, USACE COR, SAIC Project Manager, and RVAAP Facility Manager will be notified. If the CRM is not available, the discovery will be reported to OHARNG Range Control.

The CRM or Range Control will collect or secure any artifacts or remains identified for analysis or curation, as appropriate. Human remains are not to be disturbed or removed. Excavation activities will not resume until the OHARNG Standard Operation Procedures for inadvertent discovery of cultural material is completed and the site has been released by the OHARNG CRM.

5.3 OHIO EPA REQUIREMENTS FOR THE ISOLATED WETLAND

A wetlands and other waters delineation was conducted by EnviroScience, Inc. in November 2008. Results of the this delineation are documented in *The Wetlands and Other Waters Delineation Report for the Remedial Action at Ramsdell Quarry Landfill, Load Line 12 and Fuze and Booster Quarry Landfill/Ponds* (EnviroScience 2008). The report identified the areas in which soil remediation is planned as an isolated palustrine emergent wetland, which is classified as a Modified Category 2 wetland using the Ohio Rapid Assessment Method (ORAM). Delineated wetlands within RQL are depicted on Attachment C, Drawing C-3. This report was submitted to the USACE-Pittsburgh District for Jurisdictional Determination. USACE-Pittsburgh District concurred that the wetland areas that will be disturbed during remedial activities are isolated and fall under the jurisdiction of the Ohio EPA.

The following subsections present the Ohio EPA General Conditions, pre-construction herbicide application, mitigation requirements, mitigation timing, and performance criteria for the isolated wetland.

5.3.1 General Condition Requirements

SAIC, the Subcontractor, and the U.S. Army will ensure the Ohio EPA's General Conditions for implementing this remedial design within the isolated wetland are adhered to. The General Conditions are presented below:

1. All water resources and their buffers which are to be avoided shall be clearly indicated on Attachment C, Drawings C-4 and C-5 and demarcated in the field with suitable materials, prior to site disturbance. These materials shall remain in place and be maintained throughout the construction process.
2. All water resources and their buffers which are to be avoided shall be adequately protected with suitable materials, including silt fencing if appropriate, prior to site disturbance. Details of the protection of water sources are presented in the SWPPP in Attachment B. These materials shall remain in place and be maintained throughout the construction process.

3. Best Management Practices (BMPs) shall be utilized throughout the course of this project to avoid the creation of unnecessary turbidity which may degrade water quality or adversely affect aquatic life outside of the project area.
4. Temporary fill shall consist of suitable non-erodible material, or shall be stabilized to prevent erosion.
5. Materials used in this project for fill shall consist of suitable material free from toxic contaminants in other-than-trace quantities.
6. Procedures shall be developed and implemented to eliminate the possibility of spills and to control dust that may enter the waterway by runoff or point discharge.
7. Unpermitted impacts to surface water resources and/or their buffers occurring as a result of this project will be reported within 24 hours of occurrence to Ohio EPA for further evaluation.
8. Storm water basins on-site which have water quality features (Forebay, Aquatic Benches and Wetlands, Optimum Flow Length, Reverse Flow Pipe, Optimum Pool Depth, Shading and Buffer Plants, and Runoff Reuse) shall meet the design specifications contained in the Ohio Department of Natural Resources Rainwater and Land Development document, second edition, 1996, or successor document.
9. Storm water management measures shall be inspected immediately after any storm event greater than one-half inch of rain per 24 hour period. Specifications for any necessary repairs and removal of sediment deposition are specified in the SWP3 (Attachment B).
10. Representatives from the Ohio EPA, Division of Surface Water will be allowed to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of this water quality certification. It is anticipated that the Ohio EPA will perform a site visit in the third and fifth years (at a minimum) after excavation.
11. In order to protect the Indiana bat from impacts from this development, SAIC and the Subcontractor shall perform all activities in accordance with the Indiana bat management strategy set forth in the Integrated Natural Resource Management Plan.
12. All dredged material must meet CERCLA disposal requirements, as outlined in Section 10.0 of this RD.
13. If herbicide application(s) are proposed for the control of invasive plant species, SAIC and the Subcontractor will contact Ohio EPA at 614-644-2001 and speak with the Toxicology Specialist to provide any and all necessary notifications and applications.
14. This proposal may require other permits from Ohio EPA. For information concerning application procedures, contact the Ohio EPA District Office at the following address: Northeast District Office, 2110 East Aurora Road, Twinsburg, Ohio 44087.

5.3.2 Pre-Construction Herbicide Application

At least two weeks prior to removal of the impacted soils, equipment movement areas and soil removal areas within the wetland will be treated with an invasive weed control (e.g., Rodeo, HABITAT®) herbicide by a licensed applicator.

5.3.3 Wetland Mitigation Requirements

To mitigate the wetland at the completion of remedial activities, the Subcontractor will replace soil removal areas with Ohio EPA-approved, clean fill that will support re-vegetation. The removal areas will be backfilled at a 1:1 ratio to the existing grade. The construction impacted areas will be restored to original grade. The Subcontractor will seed all disturbed areas above the existing water level at the time of the removal action with native emergent marsh seed mixture (Table 9-3 of this RD). Natural remedies may be applied to prevent invasive species from dominating the disturbed area. The entire 4.07 acre wetland complex shall be preserved in perpetuity. The Subcontractor shall post 4 X 6 inch permanent wetland preservation signs along the wetland perimeters. The signs will be placed within visible distance of each other portraying the wetland boundary.

5.3.4 Wetland Mitigation Timing

The mitigation monitoring period shall commence immediately following completion of mitigation construction and shall continue through a five-year monitoring period, except as provided for in Section 5.3.2.5. The wetland mitigation must be complete no later than 18 months from the start of excavation. Once the wetland is mitigated, SAIC and the Subcontractor will perform weekly inspections and monitoring of the mitigated wetland as part of the SWP3 until the area is 70% established.

Once the area is 70% established with no more than 25% invasive species, the U.S. Army will be responsible for quarterly monitoring of the mitigated wetland. The U.S. Army will submit an annual report to Ohio EPA Division of Surface Water Central office (attn: Jeff Boyles) and Ohio EPA Project RVAAP Project Manager. This annual report will document results from the quarterly monitoring events.

The entire 4.07 acres known as the Ramsdell Quarry Landfill Wetland shall be protected in perpetuity by the NGB through the OHARNG Integrated Natural Resources Management Program. The preserved wetland area along with GIS data shall be inserted into an Integrated Natural Resources Management Plan and monitored by the OHARNG environmental staff. The preserved wetlands shall also be entered into the Property Management Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio. The preserved wetland area shall not be subject to construction, commercial activities, hindering vegetation, dumping, or altering the hydrology.

If the preserved mitigation area is to be transferred to another property owner (including local, state or other federal agencies), NGB shall, prior to transfer of title, submit to Ohio EPA for review and approval, an acceptable legal mechanism to legally restrict the mitigated area in perpetuity consistent with the restrictions in this paragraph. The mechanism may include restrictions on the deed that transfers title, a conservation easement as defined by 5301.67, or an environmental covenant as defined by section 5301.82 of the Ohio Revised Code. The preserved area cannot be partitioned into separate properties. Upon Ohio EPA's approval of the legal mechanism, NGB shall ensure that the legal restriction is legally recorded.

5.3.5 Performance Criteria

Within five (5) years after completion of construction, the applicant shall have developed a maximum of 1.71 acres of Category 2 and/or 3 non forested wetlands. The maximum acreage will be based on the total area impacted during soil removal operations to maintain a 1:1 impact to restoration ratio. The mitigation wetland shall contain no more than 25% invasive species.

5.3.6 Contingency Plans

If the mitigation areas are not performing as proposed by the end of the fifth year of post construction monitoring, the monitoring period may be extended and/or the applicant may be required to revise the existing mitigation, or seek out new or additional mitigation areas.

5.4 PORTAGE COUNTY REQUIREMENTS

As required in the Portage County Construction Site Sediment, Erosion, and Storm Water Management Rules, SAIC will submit the site-specific SWP3 to the Portage County Soil and Water Conservation District for review. If required upon review by the Portage County Soil and Water Conservation District, five copies of the SWP3 and the Portage County Soil and Water Conservation Districts letter/report will be submitted to the Portage County Board of Commissioners for approval (in the event the project does not qualify for a waiver).

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6.0 CONSTRUCTION MOBILIZATION

This section describes construction mobilization and site preparation activities required to implement this RD. Design drawings (Attachment C) detailing remedial action requirements are referenced as appropriate throughout this section.

6.1 SUBCONTRACTOR SITE SAFETY AND HEALTH PLAN

The remedial Subcontractor responsible for implementing construction activities will prepare an addendum to the SSHP (Attachment A) in accordance with USACE and Occupational Safety and Health Administration (OSHA) guidelines. SAIC will review and approve the SSHP Addendum prior to the start of remedial activities.

6.2 SITE PREPARATION

This section describes the site preparation activities that must be performed by the Subcontractor prior to beginning construction activities at the site. Site preparation activities consist of several elements designed to maximize access to the site and prevent migration of soil during construction, including:

- Pre-mobilization activities;
- Utility clearance;
- MEC investigation and clearance;
- Establishing site controls and access;
- Setting up construction support facilities;
- Vegetation clearing;
- Constructing dewatering and diversion berms; and
- Installing erosion and sediment controls.

6.2.1 Pre-mobilization Activities

Prior to mobilization of construction equipment, a registered surveyor will delineate the boundaries of the removal areas, equipment movement areas, and MI sample subareas within the former quarry, as depicted in Attachment C, Drawings C-4 and C-5. MI soil samples will be collected and analyzed as described in Section 4.4.2 of this RD. Upon receipt and evaluation of the soil sample results, the identified soil removal areas and equipment movement areas within the quarry will be treated with a wetland invasive weed control by an Ohio EPA licensed applicator. Clearing and grubbing activities will not commence for a minimum of two weeks after the date of application.

6.2.2 Utility Clearance

SAIC and the Subcontractor will contact the RVAAP Facility Manager and the Operations and

Maintenance Contractor (Vista Sciences Corporation) to perform a utility clearance. No utilities are known to exist within the quarry bottom; however, any identified utilities (underground and aboveground) will be maintained as determined by RVAAP Facility Manager.

In the event an unmarked utility is discovered during remedial activities, all work will stop immediately and the RVAAP Facility Manager, USACE COR, and SAIC Project Manager will be notified immediately. RVAAP personnel will determine the disposition of the discovered utility. RVAAP personnel and SAIC will collaborate on any necessary actions in order to continue remedial activities. If the discovery of an unmarked utility results in a change to the scope, objectives, or schedule of this RD, SAIC will notify the USACE COR and Ohio EPA Project Coordinator for concurrence on proposed revisions and/or corrective actions.

6.2.3 MEC Investigation and Clearance

The MEC Avoidance Subcontractor will employ U.S. Army and/or Department of Defense (DoD) certified unexploded ordnance (UXO) technicians specifically trained in MEC identification, explosive items, and/or ordnance. Prior to construction activities, MEC personnel will perform a visual and magnetometer survey of the excavation area and equipment movement areas within the quarry. Access routes within the munitions response site (MRS) boundary will be at least twice as wide as the widest vehicle that will be used during excavation activities. The cleared approach paths will be the only ingress/egress routes. Construction personnel will be escorted by the UXO Technicians at all times until the removal area has been completely surveyed and cleared areas are marked. In the event an anomaly is detected, the on-site MEC Avoidance Subcontractor will be responsible for identifying suspect MEC items, and contacting the Subcontractor SSHO and SAIC Construction Manager of its discovery. The SAIC Construction Manager will contact the SAIC Project Manager, the USACE COR, and the RVAAP Facility Manager. In the event that MEC is identified in the removal area, activities will cease until measures for removing or destruction of the MEC are completed.

6.2.4 Site Control and Access

The project site will be controlled at ingress and egress points. Site controls will include:

- Controlling and monitoring access to the project work sites by usage of signage, visitors logs, and putting construction fencing and/or caution tape as required around the excavation areas;

- Erecting signs at locations indicated on Attachment C, Drawing C-6 to expedite deliveries, maintain traffic flow, promote safety, and prevent interference with other RVAAP/Camp Ravenna operations; and

- Adhering to RVAAP traffic rules.

The use of two-way radios and cell phones is permitted at the RVAAP. Workers at RQL must be able to contact Post 1 at all times.

6.2.5 Construction Support Facilities

Construction support facilities for this RD may include:

- Access roads and rock construction entrance;
- Stockpiling and equipment staging area; and
- Fueling area.

Anticipated locations for these facilities are documented on Attachment C, Drawing C-4.

6.2.5.1 Access Roads and Rock Construction Entrance

RQL will be accessed from an improved road, Ramsdell Road (Attachment C, Drawing C-6). The Subcontractor will maintain the access road to allow haul trucks to traverse safely and efficiently. If visible dust is being generated by equipment, then dust suppression measures (e.g., wetting) will be employed. Rock construction entrances and truck loading area will be completed at RQL in accordance with specifications on Attachment C, Drawings C-4 and C-8 and the SWP3 (Attachment B). A layer of geotextile fabric will be placed under the rock construction entrance and truck loading area. Number 2 (No. 2) crushed stone meeting the gradation specifications established in the American Association of State Highway and Transportation Officials (AASHTO) M 43 or American Society of Testing Materials (ASTM) D 448 will be placed to facilitate the ingress/loading/egress of on-road haul trucks onto roadways at RVAAP. The Subcontractor will maintain the rock construction entrance and truck loading area throughout the project and ensure it is free of mud. If the rock construction entrances or truck loading area become muddy, additional stone will be placed at the ingress/egress. The Subcontractor will be responsible for repairing any damage to RVAAP access roads (e.g., pavement surfaces, shoulders) resulting from his or his subcontractor's actions during the remedial action.

6.2.5.2 Stockpiling and Equipment Staging Area

The Subcontractor will install an equipment staging area in accordance with specifications on Attachment C, Drawings C-4 and C-8 to provide construction support, store a portable water tank (with secondary containment), and stage excavated soil to be loaded in on-road haul trucks. If the area is muddy or if the ground surface is significantly uneven, a layer of the earth will be cut away using heavy equipment. Once the surface is leveled, geotextile fabric will be placed over the ground surface and two 6-in courses of crushed stone (No. 2). Each course will be graded and compacted. The Subcontractor will maintain (e.g., ensure it is free of mud) and repair (e.g., add additional stone) these areas for the duration of the project.

To eliminate the need for on-road trucks to drive to the quarry bottom, excavated soil will be stockpiled adjacent to the equipment staging area, just south of Ramsdell Road. The staging area shall be bound by an earthen berm to collect any water that contacts contaminated soil. Contact water will be handled per Section 6.4.3 of this RD. At the end of the workday or during inclement weather, any stockpiled soil shall be covered with 10-mil thick plastic and weighed down with sandbags to prevent soil migration in the event of rain or high winds.

6.2.6 Fueling Areas

Fueling activities will be required to take place at the equipment staging area (Attachment C, Drawing C-4). All necessary control measures and spill equipment will be established and maintained, as specified in Section 11.5.1.

6.3 VEGETATION CLEARING

Clearing and grubbing will primarily involve felling and removing trees located on and around the excavation areas and haul truck routes. Very few trees exist within the construction area, but some large trees exist near RQL-039M and RQL-040M. Trees greater than 4 inches in diameter will be cut and neatly stacked at RQL, away from remedial activities. Trees less than 4 inches in diameter will be cut into manageable pieces and chipped. Tree stumps and associated roots within the limits of excavation shall be removed and disposed with the respective contaminated soil.

6.4 STORM WATER POLLUTION PREVENTION

6.4.1 Storm Water Control Best Management Practices

The Subcontractor will install storm water controls prior to initiating remedial activities in accordance with this section of the RD, the SWP3 (Attachment B), and as detailed on Attachment C, Drawings C-4 and C-8. BMPs will be employed to protect the excavation area from storm water run-on and run-off. Erosion and sedimentation controls will include both non-structural BMPs and structural BMPs. Non-structural BMPs to be employed at the project site include:

- Minimizing disturbance;
- Phasing of construction operations; and
- Maintaining good housekeeping practices.

Structural BMPs to be employed at the site include:

- Construction entrance/exit;
- Dewatering/diversion berms; and
- Silt fencing.

To further minimize the potential for erosion and sediment run-off, no work will be performed during

periods of inclement weather, as determined by the SAIC Construction Manager. The excavation areas will be opened and covered as quickly as possible during construction activities.

The Subcontractor will install silt fencing as specified in Attachment C, Drawings C-4 and C-8. In general, silt fencing will be installed downgradient of the equipment staging area and stockpiling area. The silt fence will undergo inspections in accordance with Section 11.5.2.

Silt fencing will not be installed around excavation areas at the bottom of the quarry since the average soil thickness above bedrock is 7 inches and installation of fencing is not practical. The quarry bottom is flat and there is no surface drainage outlet from the quarry. Therefore, silt movement is not expected to be significant.

6.4.2 Quarry Water Management

Non-contact water management (e.g., water that does not come into contact with exposed contaminated material) during remedial actions may include the following:

1. Removal of water in the quarry bottom before remedial activities take place; or
2. Removal of water that accumulates in the quarry bottom during remedial activities but does not contact exposed contaminated areas.

The amount of quarry water varies throughout the year. Dependant upon the water level, there may be water near or within the anticipated excavation areas.

Prior to soil remedial activities, the Subcontractor will pump the quarry water from the quarry bottom to the wooded areas on the outside of the landfill. The Subcontractor will use a sediment bag to minimize sedimentation build up at the receiving areas. The pumping will be conducted so that no significant ponding or flooding occurs in the receiving areas. As needed, the pump hoses will be moved if a receiving area gets too saturated.

The pumping activities will continue to occur on an “as needed” basis during the soil remedial activities. As shown in Attachment C, Drawing C-4, diversion berms (sandbags, temporary cofferdams, or an equivalent watertight barrier) will be placed outside of the excavation areas adjacent to the wetland area. As water accumulates against the dewatering berm during excavation, water will be pumped as described above, as long as there is not contact with the exposed contaminated areas.

6.4.3 Excavation Water Management

Excavation water (or contact water) is considered any water that accumulates in the excavation or the excavation soil stockpile that comes into contact with exposed/disturbed soil containing contaminants above the remedial CUG during remedial activities. The Subcontractor will be responsible for pumping excavation water to a portable water storage tank located near the excavation area. The

portable water tank will be staged and stored as to avoid streams and water bodies and equipped with secondary containment. The Subcontractor will also be responsible for sampling and disposing the excavation water in accordance with Section 10.2 of this RD.

6.4.4 Erosion Control Schedule

Erosion/sedimentation control features will remain in place until completion of site restoration activities as determined by the SAIC Construction Manager. Inspection of storm water controls will be performed by the Subcontractor on a daily basis while site remedial activities are being conducted.

6.4.5 Preventive Maintenance

Preventive maintenance shall be performed on equipment to ensure proper operation and to detect potential leaks before they occur. Good housekeeping practices shall be maintained at all times during construction activities. All employees shall practice due diligence to prevent any damage to the storm water control measures. Containers shall be provided at all necessary locations for the collection of trash and general construction debris. Fueling activities shall be conducted at the staging area away from storm water conveyances. If a mobile fuel truck is used to re-fuel construction equipment, the truck shall be staged within the secondary containment with on-hand spill response supplies. The secondary containment area will be inspected daily.

6.5 DUST AND WIND CONTROLS

All excavations, access roads, and all other work areas within the project boundaries will be maintained free from soil that could cause a hazard or nuisance. Dust generation activities may occur during material excavation, handling, and transportation. Dust control will be maintained by keeping traffic on improved roads, maintaining the posted speed limit, and applying water as required. The Subcontractor will employ water spraying/misting for dust control if airborne dust is observed. Water used for dust control will be clean (e.g., obtained from RVAAP sources with approval of the RVAAP Facility Manager or potable water obtained from an off-site source). The use of additives will not be permitted.

During instances of high winds resulting in excessive dust, additional dust control measures or work stoppage may be required. The Subcontractor SSHO will be responsible for visual dust monitoring. At a minimum, visually monitoring of fugitive dust emissions will be conducted daily during representatively normal operating conditions.

6.6 GOOD HOUSEKEEPING

Good housekeeping practices are designed to maintain a clean and orderly work environment. Good housekeeping measures will include at a minimum:

- Regular pickup and disposal of garbage and waste material;

- Daily equipment and material inspections for leaks and/or conditions that could potentially lead to a discharge of a petroleum product, chemical or waste;
- Perform preventative maintenance on equipment to ensure it is in proper operation and to detect potential leaks before they occur; and
- Ensure that spill cleanup procedures outlined in Section 12.1.2 of the FWSHP (USACE 2001b) are understood by employees, contractors, and/or subcontractors, and established storage areas are away from streams and water bodies. The storage area will also be away from direct traffic routes to prevent accidental spills.

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7.0 SOIL REMEDIAL ACTIVITIES

This section describes the remedial activities to be performed in support of this RD:

- Land survey and MEC avoidance;
- MEC anomaly investigation and removal (if needed);
- Excavation of contaminated surface soil; and
- Equipment decontamination.

Design Drawings (Attachment C) detailing remedial action requirements for the performance of soil remediation and associated activities are referenced as appropriate throughout this section.

If any unsafe or unexpected site condition or material (e.g., MEC) is encountered during any phase of the remedial activities, work will stop immediately and the SAIC Project Manager, USACE COR, and the RVAAP Facility Manager will be notified immediately. The condition will be assessed and a joint determination will be made regarding continuation of remedial activities. Work will not resume until approval has been granted by the USACE COR. If the discovery results in a change to the scope, objectives, or schedule of this RD, SAIC will notify the USACE COR and the Ohio EPA Project Coordinator for concurrence on proposed revisions and/or corrective actions.

7.1 LAND SURVEY

Prior to the start of excavation activities, a surveyor will establish the initial horizontal limits of excavation by land survey for each removal area. The excavation limits will be demarcated in accordance with Attachment C, Drawing C-5.

7.2 MEC IDENTIFICATION AND REMOVAL

The MEC Avoidance Subcontractor will employ U.S. Army and/or DoD certified UXO technicians. The MEC Avoidance Subcontractor will provide personnel specifically trained in MEC identification, explosive items, and/or ordnance. If any suspect or known MEC is encountered during the excavation, activities will cease, the area will be clearly marked, its position annotated on the site map, and the MEC Technician will notify the SAIC Construction Manager. The MEC Technician will be responsible to evaluate the item. No MEC will be removed without positive identification of the item, an evaluation of its condition, and approval from the USACE Ordnance and Explosives (OE) Safety Specialist, unless the item has been determined to be free of explosives. MEC items will be removed or blown in place by the MEC Avoidance Subcontractor as specified in the ESS.

7.3 EXCAVATION

This section describes the excavation activities for the removal of soil within the limits of excavation. The limits of excavation for RQL are presented on Attachment C, Drawing C-5. The lateral limits of excavation are based on the confirmation sampling results described in Section 4.0. The vertical extent of the excavation will either be 1 ft BGS (exposure depth of the Security Guard/Maintenance Worker) or until bedrock is encountered. Excavation will occur in MI areas that exceeded the CUGs presented in Section 3.0. The current estimated in situ volume of soil exceeding CUGs, based on 2009 MI confirmation samples, is 1,608 cubic yards. This area will be refined through additional sampling prior to remedial actions.

7.3.1 General Sequence of Excavation

The general sequence of excavation is as follows:

1. Land survey will be performed to establish the MI sample areas requiring soil remediation (Attachment C, Drawing C-5);

2. Sampling of MI sample sub-areas will be performed;

3. Soil excavation will be performed within the surveyed MI areas with COC concentrations greater than CUGs to a depth of 1 ft BGS or until bedrock is encountered;

4. The excavated soil will be transferred from the quarry bottom to a staging area using an off-road haul truck;

5. The soil at the staging area will be loaded into on-road haul trucks and transported to a licensed disposal facility;

6. Confirmation of contaminated soil remediation will be completed in accordance with Section 8.0;

7. Grading and backfill will occur upon approval from the SAIC Construction Site Manager; and

8. The site will be restored in accordance with Section 9.0 and Attachment C, Drawing C-7.

7.3.2 Excavation Activities

Excavation activities will be performed to minimize the handling of materials. Excavation activities will include:

- Dewater excavation area (if necessary);

- Excavation of contaminated soil within the defined extent;
- Loading of soil into off-road haul trucks for transport to the staging area; and
- Loading of soil into on-road haul trucks at the staging area for transfer to disposal facility.

In the event excavated soils are saturated and a potential exists for water to leak or drip during the removal and transportation of soil, the Subcontractor shall apply and mix an absorbent material (such as, saw dust, woodchips) with the soil within the limits of the excavation. The Subcontractor will ensure that an adequate amount of absorbent material is mixed so that free water is not present in the haul truck and there are no liquids escaping the truck bed. The Subcontractor will not use any absorbent material that could potentially change the chemical profile of the contaminated soil.

Any excavation equipment that enters contaminated areas will require decontamination. The Subcontractor will try to limit the number of pieces of heavy equipment that enter into the excavation area. An excavator with an extended boom will be used and the excavation equipment will enter through areas where confirmation sampling indicates CUGs are obtained. It is anticipated only the excavator bucket and off-road haul truck bed will require decontamination. Any equipment contacting the contaminated soil will be decontaminated in accordance with Section 7.4 of this RD.

The excavation areas will be covered at the end of each work day. Impermeable covers will be used by the Subcontractor to cover exposed soil at the end of each work day and during periods of inclement weather. The impermeable covers will be secured with sand bags (or equivalent).

No suspect or unexpected material, such as drums or cylinders, is anticipated during excavation activities. If an unexpected site condition or material is encountered during any phase of the remedial activities, construction activities will stop immediately and be re-assessed in accordance with procedures outlined in the SSHP (Attachment A).

7.3.3 Staging Area

To eliminate the need for on-road trucks to drive to the quarry bottom, the Subcontractor will construct an earthen berm to stockpile excavated soil. The berm will be constructed adjacent to the equipment staging area, just south of Ramsdell Road (Attachment C, Drawing C-5).

Prior to installing the earthen berm, the contractor will remove and stockpile the existing topsoil from the surface. The stockpiled topsoil, as well as any stockpiled borrow material (other than the removed material) remaining on-site for more than 24-hours, shall be covered at the end of the work day and during inclement weather. The cover will be at least 10-mil plastic. Additionally, the perimeter of the pile shall be bound by silt fence or straw bales.

The Subcontractor shall construct the earthen berm with clean fill obtained from an off-site source. The fill material must meet the borrow source analytical requirements specified in Table 9-1.

At the end of the workday and during inclement weather, the stockpiled excavation soil shall be covered with 10-mil thick plastic and weighed down with sandbags to prevent soil migration in the event of rain or high winds, and contact water. Any water collected within the bermed area will be considered excavation water, and will be handled per Section 6.4.3 of this RD.

Once remedial activities are complete and all soil is disposed of from the bermed area, the Subcontractor will perform confirmation sampling as described in Section 8.2, and restore the area as described in Section 9.1.

7.4 DECONTAMINATION

Contact with contaminated soil will be actively minimized. The Subcontractor will implement measures to prevent the tracking of material from the excavation. Equipment used to excavate and haul contaminated soil will be decontaminated prior to contact with other materials and prior to demobilization off-site. Equipment that comes into contact with contaminated soil will be decontaminated as follows:

- The excavator bucket and other equipment will be placed over the haul truck or portable decontamination pad and washed with a pressure washer. Limited amounts of liquids (i.e., less than 30 gallons) will be used for decontamination activities performed over haul trucks. The Subcontractor will ensure free water is not present in the haul truck and there are no liquids escaping the truck bed. The Subcontractor will not use any liquid for decontamination that could potentially change the chemical profile of the contaminated soil (such as, addition of solvents or pH).

- All loose soil will be removed using a stiff-bristle brush or other device to dislodge visible soil.

- Steam clean equipment using potable water.

- Allow equipment to air dry as long as possible.

- Use clean plastic to provide storage or wrap equipment while not being used.

- Loose soil and wash water will be mixed with excavated soil and placed into a haul truck for disposal (decontamination liquids will consist of less than 30 gallons per truck and will not change the chemical profile of the excavated material).

At the end of each day and during periods of non-operation (e.g., weekends) the excavator bucket will be wrapped with 6-mil (minimum thickness) low density polyethylene sheeting and bound using duct tape and/or wire in sufficient manner to prevent exposure to weather elements.

Prior to release of construction equipment from the site, the SSHO, or designee, will visually inspect (and document) construction equipment with specific attention to:

- Tires and wheels or tracks (as applicable);
- Undercarriage (e.g., frame, axles);
- Exterior surfaces (including steps, running boards);
- Engine compartment; and
- Operator compartment.

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8.0 CONFIRMATION OF REMEDIAL ACTIVITIES

8.1 QUARRY BOTTOM CONFIRMATION

Prior to the excavation activities, the quarry bottom of RQL will have undergone confirmation sampling. At the time this design is submitted, three MI sample areas (RQL-035M, RQL-036M, and RQL-038M) have been verified as being below CUGs. Additional sampling that will take place to further refine contamination in the quarry bottom may result in additional MI sample areas being below CUGs, as described in Section 4.0. The areas below the CUGs will not require additional sampling or soil remediation. Soil removal from neighboring areas will not expand into the MI sample areas that are confirmed to be below the CUGs.

As the exposure for the Security Guard/Maintenance Worker is only 1 ft BGS, soil removal activities will not exceed this depth. Once contaminated soil is removed and the area is backfilled and restored to the neighboring ground surface, the remedial action will be sufficiently protective for this land use. The average thickness of soil at the bottom of RQL was determined to be 7 inches. Therefore, bedrock may be encountered before achieving a depth of 1 ft BGS.

The following presents the requirements to confirm the removal of contaminated soil at the bottom of RQL:

1. Laterally, all soil within a contaminated area above CUGs is removed until encountering the boundary of an adjacent MI sample area confirmed to have concentrations below the CUGs;

2. The vertical extent of the soil within a contaminated area above CUGs is a minimum of 1 ft BGS; and

3. If bedrock is encountered during the removal activities (i.e., the soil thickness is less than 1 ft BGS), as much soil on bedrock will be removed as practical. The Ohio EPA Project Coordinator will make the ultimate decision if the amount of soil removed is adequate.

Site restoration activities will occur when the designated areas of remediation have met the prescribed CUGs. Initiation of restoration activities will commence upon the approval from the SAIC Construction Manager in conjunction with the USACE COR and Ohio EPA.

8.2 STOCKPILE AREA CONFIRMATION SAMPLING

At the completion of the remedial activities and once all the soil is removed from the staging area, the ground surface in the staging area will be scraped using an excavator. One MI confirmation sample will be collected from the footprint of the stockpile area and analyzed for the COCs. The concentration of COCs in the surface soil will be evaluated against the remedial CUG. If the

concentration is above the remedial CUG, the staging area will require further excavation until the concentration is at or below the CUGs.

9.0 SITE RESTORATION

Site restoration will begin after the area confirmation is performed in accordance with Section 8.0 of this RD. The Subcontractor will restore the site to the required conditions set forth in Attachment C, Drawing C-7. At a minimum, this will include:

- Backfilling and grading to neighboring contours;
- Re-vegetation (excavation and construction support areas); and
- Removal of erosion controls.

9.1 RE-GRADING AND BACKFILL

The excavation areas and staging and stockpile areas will be backfilled and re-graded to neighboring contours. The backfill will be packed adequately so surface water flow does not erode backfill material. Within the former quarry (wetland area), only portions of the excavation areas above the natural water line will be backfilled. The backfill shall support vegetative growth. Attachment C, Drawing C-7 presents the contour specifications for site restoration.

The Subcontractor will use approved backfill material for site restoration activities. If the backfill material will not support re-vegetation (e.g., clayey soil), a minimum of 4 inches of vegetative cover (e.g., topsoil) will be placed on the backfill material to support vegetative growth in all areas requiring re-vegetation. Where necessary, ruts and depressions along off-road haul routes and construction support areas will be re-graded, seeded, and mulched.

The Subcontractor will identify an off-site source of backfill. Per Ohio EPA guidance, one MI sample will be collected by SAIC for every 4,000 cubic yards of backfill or vegetative cover used. This quantity of backfill or vegetative cover must come from the same source or an additional sample must be collected. The samples will be analyzed for the parameters identified in Table 9-1. The backfill and vegetative cover must be approved by Ohio EPA and, at a minimum, be at or below the facility-wide background values shown in Table 9-2. Project Quantitation Levels will be in accordance with the FWSAP (USACE 2001a).

Table 9-1. Borrow Source Sampling Analytical Requirements

Parameter	Methods
VOCs, TCL	SW-846 5030/8260B
SVOCs, TCL	SW-846 3540/8270C
Pesticides, TCL	SW-846 3540/8081A
PCBs	SW-846 3540/8082
Explosives	SW-846 3540/8330
Nitro-glycerine	SW-846 3540/8330
Nitro-guanadine	SW-846 3540/8330 Modified
Nitrocellulose	MCAWW353.2 Modified
Metals, TAL	SW-846 6010B/6010A/7471
pH	SW-846 9040/9045

PCB = Polychlorinated Biphenyl
SAP = Sampling and Analysis Plan
SVOC = Semi-Volatile Organic Compound
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound

Table 9-2. RVAAP Facility-Wide Background Criteria for Surface Soils

Parameter	Background Criteria (mg/kg)	Parameter	Background Criteria (mg/kg)	Parameter	Background Criteria (mg/kg)
Aluminum	17,700	Cobalt	10.4	Nickel	21.1
Antimony	0.96	Copper	17.7	Potassium	927
Arsenic	15.4	Cyanide	0	Selenium	104
Barium	88.4	Iron	23,100	Silver	0
Beryllium	0.88	Lead	26.1	Sodium	123
Cadmium	0	Magnesium	3,030	Thallium	0
Calcium	15,800	Manganese	1,450	Vanadium	31.1
Chromium	17.4	Mercury	0.036	Zinc	61.8

mg/kg = Milligrams per Kilogram

9.2 REMOVAL OF PLACED STONE

The equipment staging area and rock construction entrances at RQL will remain in place, as they will be used in the future by the Army (Attachment C, Drawing C-7). The Subcontractor will apply and grade one four inch lift of No. 57 stone over the existing No. 2 stone during restoration activities.

9.3 FINAL GRADING

Final grading will be performed to match surrounding elevations and prevent erosion (Attachment C, Drawings C-7). The final grade of the excavation areas, as well as, all areas disturbed during remedial activities will be approved by the SAIC Construction Manager.

9.4 RE-VEGETATION

All disturbed areas must be seeded within seven days following excavation, backfilling, and final grading activities. The former quarry bottom shall be seeded with the Emergent Marsh seed mixture presented in Table 9-3. Additionally, the former quarry will be seeded with an annual rye grass at a broadcast application rate of no less than 10 lbs per acre. The vigorous seedlings of the rye grass will provide rapid ground cover within the wetland areas and prevent invasive species from overtaking the newly seeded wetland.

Table 9-3. "Emergent Marsh" Seed Mixture for RVAAP/Camp Ravenna

Seed Type	Mixture %
Shallow/Lurid Sedge (*Carex lurida)*	10.0
Blunt broom sedge (*Carex scoparia)*	10.0
Fox sedge (*Carex vulpinoidea)*	20.0
Boneset (*Eupatorium perfoliatum)*	2.0
Soft rush (*Juncus effuses)*	10.0
Rice cutgrass (*Leersia oryzoides)*	4.0
Great/Soft-stemmed Bulrush (*Schoenoplectus tabernaemontani)*	5.0
Dark green bulrush (*Scirpus atrovirens)*	15.0
Woolgrass (*Scirpus cyperinus)*	7.0
Giant Bur Reed (*Sparganium eurycarpum)*	15.0
Swamp milkweed (*Asclepias incarnate)*	0.5
Blue Vervain (*Verbena hastate)*	1.0
Nodding bur marigold (*Bidens cernua)*	0.5
Specifications: Broadcast at 15 lbs/acre. Mulch with a minimum of 3 bales of straw per 1,000 square feet.	

As part of the wetland mitigation plan presented in the Level Two Ohio EPA General Isolated Wetland Permit, the newly planted wetland will be monitored weekly. Wetland invasive species will be removed either physically or through spot treating with an herbicide (by a licensed applicator) until 80 percent vegetation cover is established in the newly seeded areas. Areas will be reseeded as necessary until the vegetation is established or Ohio EPA concurs that mitigation is complete.

The Subcontractor will use a Camp Ravenna-approved "open area" seed mixture for permanent cover for construction areas disturbed during field activities (e.g., the staging area). Table 9-4 presents the seed mixture and application specifications. Fertilizer and lime are not needed for seeding with native seed mixes.

Table 9-4. Open Area Seed Mixture for RVAAP/Camp Ravenna

Seed Type	Mixture %
Nodding Wild Rye (*Elymus Canadensis*)	23.5%
Virginia wild rye (*Elymus virginicus*)	25%
Little Bluestem (*Schizachyrium scoparium*)	22%
Partridge Pea (*Chamaecrista fasciculate*)	18.75%
Thin-leaved Coneflower (*Rudbeckia triloba*)	7.75%
Brown fox sedge (*Carex vulpinoidea*)	1.5%
Black-eyed Susan (*Rudbeckia hirta*)	1.5%
Specifications: Broadcast at 18 lbs/acre, drilled at 12 lbs/acre. Mulch with a minimum of 3 bales of straw per 1,000 square feet.	

Other effective materials may be used, including specialized seeding products/technologies such as seed impregnated fiber matting. Any product or technology used for seeding the construction areas will meet the seeding requirements presented in Tables 9-3 and 9-4 and applicable Ohio EPA storm water pollution prevention controls.

9.5 REMOVAL OF EROSION CONTROLS

Erosion control measures shall remain in place until the grass is established with a density of at least 70 percent coverage in all disturbed construction areas, in accordance with Ohio Rainwater and Land Development guidance (ODNR 2006). The site will be inspected weekly until the construction areas achieve at least 70 percent vegetation coverage. This is not necessary for the wetland restoration at the bottom of RQL, as the Ohio EPA Wetland Coordinator indicated inspections and maintenance would not be necessary after seeding. This will be specified in the Level Two Ohio EPA General Isolated Wetland Permit. Once the construction areas achieve the 70 percent coverage, the erosion control measures will be removed and disposed.

10.0 WASTE CHARACTERIZATION AND DISPOSAL

This section describes waste characterization, transportation, and waste disposal activities that will be performed in support of implementing this RD. Waste includes remedial waste (e.g., excavated soil, excavation water) and any IDW generated during sampling activities. All waste will be properly handled, labeled, characterized, and managed in accordance with Section 7.0 of the FWSAP, Federal and State of Ohio Large-Quantity Hazardous Waste Generator Requirements, and RVAAP's Installation Hazardous Waste Management Plan. All waste will be appropriately accounted for as soon as possible and prior to conclusion of the project.

10.1 WASTE STREAM IDENTIFICATION

Waste generated during remedial activities will be managed to prevent the potential release of contamination. The following types of waste may be generated:

- Vegetation;
- Excavated soil;
- Decontamination fluids from sampling activities;
- Sanitary waste;
- Personal protection equipment (PPE) and contact waste (e.g., plastic tarps, ground cloths);
- Excavation water in direct contact with contaminated soil; and
- Decontamination fluids generated during the decontamination of excavation equipment.

No soil IDW is anticipated during the collection of soil confirmation samples. The entire volume of soil collected for these samples will be shipped to the laboratory. The laboratory will be responsible for the ultimate disposition of remaining soil.

In general, proper waste minimization procedures will be employed to limit the volume of waste generated. These procedures will include:

- Re-use of materials that do not require decontamination;
- Minimization of the volume of decontamination fluids;
- Minimization of contact with potentially contaminated materials;
- Minimization of foot and vehicle traffic through potentially contaminated areas; and
- Utilization of good housekeeping practices.

10.2 WASTE STREAM MANAGEMENT

Table 10-1 presents and discusses each potential waste stream for this RD. Characteristics for each waste stream include: the point of generation, on-site staging and processing, characterization requirements, and method of final disposition.

Table 10-1. Waste Characterization & Disposal

Waste Stream Identification	Point of Generation	On-Site Staging and Processing	Characterization Requirements	Final Disposition
Surface Vegetation (trees and shrubs)	In area of excavation vegetation will be cut to a height of not greater than three inches above the ground surface.	Trees greater than four inches in diameter will be cut and stacked neatly at the AOC away from remedial activities. Trees less than four inches in diameter shall be cut into manageable pieces and chipped. Wood chips not used for absorbent material will be spread over the AOC by the Subcontractor.	No characterization required.	Roots and root balls within the excavation foot print and wood chips used on-site for absorbent material will be considered potentially contaminated material and disposed with excavated soil.
Excavated Soil	Soil will be generated during the excavation and remedial activities at RQL.	Excavated soil will be directly loaded into on-road haul trucks. Truck beds will be lined as required by state, Federal Department of Transportation (DOT), or disposal facility requirements.	Characterization sampling of soil will be performed prior to mobilization and excavation activities. Samples will be analyzed for TCLP to determine classification of wastes (hazardous, nonhazardous).	Excavated soil will be removed from the AOC under a RVAAP signed manifest by a licensed waste disposal contractor and disposed at an approved disposal facility permitted by the State of Ohio to accept the waste.
Decontamination Fluids (sampling activities)	In the event that disposable plastic scoops cannot be used during sampling, stainless-steel spoons and bowls will be used to collect samples. These tools require decontamination between samples resulting in the generation of fluids.	Due to the anticipated small quantity generated, all IDW liquid will be combined and contained in a labeled DOT approved 55-gallon closed-top drum.	One representative sample will be collected and characterized in accordance with Section 7.4 of the FWSAP.	Removed from the AOC by a licensed waste disposal contractor and disposed at an approved disposal facility permitted to accept the waste.
Sanitary Waste Non-contaminated (e.g., garbage, paper waste, silt fence, and non-indigenous solids)	Primarily generated by personnel working at the site during remedial activities.	Collected daily in plastic-lined trash cans and moved to a designated area as specified in Section 7.3 of the FWSAP.	No characterization required.	Disposed in a licensed solid waste disposal facility in accordance with local, state and federal regulations.

Table 10-1. Waste Characterization & Disposal (continued)

Waste Stream Identification	Point of Generation	On-Site Staging and Processing	Characterization Requirements	Final Disposition
PPE (gloves, boot covers) and Contact Waste (plastic sheeting)	Generated by the site workers on a daily basis.	PPE that comes into contact with hazardous material requires temporary disposal in 55-gallon drums and ultimate disposal at a permitted hazardous waste facility. PPE that does not come into contact with hazardous material will be collected in trash bags and disposed of daily in an RVAAP or project specific dumpster.	Characterized in accordance with Section 7.4 of the FWSAP. Generally, PPE will be characterized for disposal based upon the soil it was in contact with.	PPE will be disposed of in accordance with Section 7.5 of the FWSAP (USACE 2001a). It will be disposed of as either sanitary waste or as a permitted hazardous waste in a permitted hazardous waste facility.
Excavation Water	Potentially generated in excavation and staging areas during rain events.	Accumulated excavation water will be pumped into a temporary water storage tank. Minimal quantities are anticipated given; the nominal footprint and depth of the excavation area, and the excavation footprint will be covered during inactivity.	If characterization sampling results of soil indicate low concentrations of analytes, Ohio EPA may waive characterization sampling of excavation water. Should characterization sampling of excavation water be required; excavation water will be analyzed for parameters presented in Table 1-1 of FWSAP QAPP (USACE 2001a) [c].	The Ohio EPA Project Coordinator will determine method of disposal from the following three choices: (1) land application (according to land application guidelines) [a]; or (2) off-site disposal by a commercial management firm at a licensed waste disposal facility. Sediment collected in the bottom of the tank will be disposed of as excavated soil.

Table 10-1. Waste Characterization & Disposal (continued)

Waste Stream Identification	Point of Generation	On-Site Staging and Processing	Characterization Requirements	Final Disposition
Decontamination Fluids (excavation equipment)	Generated as a result of decontamination of excavation equipment during and after all excavation remedial activities.	Decontamination of excavation equipment will be conducted over the truck bed of the final haul truck upon completion of the final haul excavation activities. The amount of water to be used will be minimized such that water accumulation in the haul truck will not exceed the requirements of the disposal facility or leak during transport. Should there be a requirement for an equipment decontamination pad, water generated from this activity will be collected and stored with excavation water.	No characterization required.	Decontamination water will be disposed of in the haul truck along with excavated soil.

a. The guidelines for land application of excavation water are as follows:
- Discharge will only occur in a grassy, well-vegetated area of the AOC (RQL) from which it was generated;
- Discharge rates will be kept at a minimum to reduce any ponding or puddling (a spreader bar may be utilized);
- Discharge will not be released directly into surface water (e.g., creeks, ditches, streams); and
- Any accidental release to a surface water body shall be reported immediately to Ohio EPA.

b. The parameters include VOCs, SVOCs, pesticides, PCBs, explosives, nitroquandine, nitrocellulose, PAHs, metals (TAL), and cyanide.

AOC = Area of Concern
DOT = Department of Transportation
FWSAP = Facility-Wide Sampling and Analysis Plan
IDW = Investigation-Derived Waste
Ohio EPA = Ohio Environmental Protection Agency
PAH = Polycyclic Aromatic Hydrocarbons
PCB = Polychlorinated Biphenyls
PPE = Personal Protective Equipment
QAPP = Quality Assurance Project Plan
RQL = Ramsdell Quarry Landfill
RVAAP = Ravenna Army Ammunition Plant
SVOC = Semi-Volatile Organic Compound
TAL = Target Analyte List
TCLP = Toxicity Characteristic Leaching Procedure
VOC = Volatile Organic Compound

10.3 INVESTIGATION-DERIVED WASTE FIELD STAGING

A Field Staging Area (FSA) will be designated at the beginning of field activities and approved by the RVAAP Facility Manager. A centralized FSA will be established for the staging of all drums of IDW. The FSA will be managed according to the requirements of Section 7.3 of the FWSAP (USACE 2001a). Any excavation water will be containerized in a storage tank staged proximate to the removal areas in the event water accumulates in the excavated area.

Final inventories of IDW will be taken and provided to the RVAAP Facility Manager by the designated SAIC Construction Manager. All nonhazardous liquid waste not transported off of the facility within 30 days following project completion will require secondary containment. Any soil/sediment or liquid waste identified as hazardous through process knowledge or characterization must be staged in the designated RVAAP 90-day hazardous waste storage area and managed in accordance with facility requirements, as described in Section 7.3 of the FWSAP (USACE 2001a).

10.4 WASTE CONTAINERIZATION AND LABELING

All waste storage containers (e.g., drums, tanks,) will be of suitable size, leak proof, and constructed of materials compatible with the materials to be contained. Waste storage containers will be properly labeled prior to placement of material.

The Subcontractor will be responsible for providing new State and Federal DOT-approved containers for the liquid IDW. The Subcontractor will be responsible for the waste characterization, container labeling, transportation and final disposal at a State of Ohio or Federal-approved treatment, storage, or disposal (TSD) facility of all decontamination liquids. The RVAAP Facility Manager will approve all waste profiles and waste manifests for the disposal of project IDW to approved disposal facility.

All IDW containers will be labeled prior to placing IDW in them. All IDW containers (drums) will be labeled in accordance with Section 7.2 of the FWSAP (USACE 2001a). Each IDW container will be labeled to ensure easy identification and proper management. Prior to placing IDW into a container, a “Pending Analysis” label containing the following information will be affixed to the outside of the container:

- Project name;
- Contents;
- Date waste was first placed into the container;
- Source location(s); and
- Emergency contact name and telephone number.

All IDW containers will be closed and stored in the equipment storage area. Liquid IDW containers will be filled to a maximum of 66% of the container volume and will be placed on spill containment pallets. All IDW containers and pallets will be covered with a weather-proof tarp. All IDW

containers will be inspected to ensure no leaks or releases occur during use. An orange construction fence will be installed around the IDW storage area.

10.5 TRANSPORTATION, STORAGE, AND DISPOSAL

The management, transportation, and disposal of all waste streams will be coordinated with RVAAP. All transportation paperwork (manifests or shipping papers) and on-road haul truck placards will be prepared by the Subcontractor Construction Supervisor in accordance with federal, state, and local regulatory requirements, and disposal facility requirements. A draft of the transportation paperwork containing "base" information will be submitted to RVAAP for review and approval a minimum of one week prior to shipment of any material. The approved transportation paperwork will then be completed as appropriate by the SAIC Construction Manager in the field during excavation activities. The RVAAP Facility Manager will be responsible for custody of manifest copies and submittal to Ohio EPA and United States Environmental Protection Agency (USEPA) as part of the annual reporting for RVAAP hazardous waste generation and management.

Contaminated soil loaded into on-road haul trucks will be transported by licensed waste haulers to RVAAP and SAIC-approved licensed off-site disposal facilities. All transportation requirements, including proper labeling, placarding, and weight limits will be followed. All manifests, shipping documents, and disposal facility approval letters will be provided to SAIC and incorporated into the Construction Report.

All other waste types (such as, IDW, other materials, and excavation water) will be managed by the Subcontractor in compliance with all federal, state and local laws. The RVAAP Facility Manager will sign all waste profiles and waste manifests for the disposal of project wastes at an approved facility. All manifests, shipping documents, and disposal facility approval letters will be provided to SAIC.

11.0 CONSTRUCTION QUALITY ASSURANCE PLAN

This section presents the CQAP. The CQAP describes the inspection procedures and documentation required to ensure excavation, disposal, and restoration activities occur according to the requirements of this RD.

Protocols for reporting test results, certifying compliance with construction requirements, correcting construction deficiencies, and documenting such corrections are provided. This section also addresses the review and documentation requirements necessary to comply with the site restoration details contained herein.

11.1 RESPONSIBILITY AND AUTHORITY

11.1.1 Responsibility

The organizational chart presented in Figure 2-1 outlines the management structure that will be used to implement the excavation and disposal activities in accordance with this RD. Functional responsibilities of key personnel were described in Section 2.1. The assignment of personnel to each position was based on the following:

- Qualifications;
- Experience; and
- Training.

The SAIC QA/QC Officer and SAIC Construction Manager, in coordination with the USACE COR, will ensure the completed remedial activities conform to the RD, design drawings, specifications, and any necessary permit conditions. The SAIC Project Manager will verify completion of these activities.

The SAIC Construction Manager will monitor excavation, disposal, and site restoration activities. The SAIC Construction Manager or designee will be on-site during work activities to ensure that all components of this RD are fulfilled.

11.1.2 Administration and Operation

The QA/QC organization is administered by the SAIC QA/QC Officer in concert with the SAIC Construction Manager. The SAIC Construction Manager will be supported by the Subcontractor Construction Supervisor and technical staff (engineers, scientists, and technicians) as necessary.

All vendors supplying materials used for site restoration and storm water control will supply materials from manufacturing facilities with established QC programs. Results of the manufacturer QC

procedures will be submitted to the QA/QC Officer for review, evaluation, and documentation prior to beginning field activities.

11.2 PERSONNEL QUALIFICATIONS

All QA/QC personnel will be properly trained for their job function. The SAIC Construction Manager is key to the inspection and certification program. The SAIC Construction Manager will have demonstrated knowledge of specific construction practices relating to earthwork, regulations and specifications, observation and testing procedures, and documentation procedures. The SAIC Construction Manager will also be experienced in performing similar duties on previous jobs in which comparable construction activities took place.

11.3 ACCESS PROTOCOL

11.3.1 Facility Access Protocol

The RVAAP Facility Manager will grant site access and the Subcontractor will control the site during remedial activities. All personnel and vehicles must enter RVAAP through the Post 1 (8451 State Route 5, Ravenna, OH 44266) and are subject to search and inspection. Weapons, lighters (or similar fire starters), and alcoholic beverages are prohibited within RVAAP; prohibited items may be placed with security personnel while onsite. Security personnel will confiscate prohibited items discovered during inspections.

SAIC will submit a roster of all personnel and subcontractors who will be working at RVAAP to the RVAAP Operations and Maintenance Contractor in advance of field work. This roster will be maintained and submitted to the RVAAP Operations and Maintenance Contractor. All personnel approved to enter RVAAP must provide a government issued identification (e.g., driver's license, passport) at the entrance. Upon entry and exit to RVAAP, each person is required to sign a roster annotating the time of day and the area they are working at or visiting.

11.3.2 Construction Area Access Protocol

All supervisors, workers, and site visitors entering the construction area must provide training records specified in Table 5-1 of the SSHP (Attachment A) prior to entry of the construction area and/or exclusion zones. Site visitors arriving throughout the day must: 1) undergo a briefing by the SAIC Construction Manager and Subcontractor SSHO; and 2) provide necessary training records and documentation prior to approaching or entering the exclusion zone. All site visitors must be approved by the SAIC Construction Manager and Subcontractor SSHO to enter the construction area and/or exclusion zones.

11.3.3 Traffic Rules and Protocol

The Subcontractor will comply with all Ohio and RVAAP traffic rules. The Subcontractor will not exceed the posted speed limits of 35 miles per hour (mph) during daylight hours and 25 mph at night while on RVAAP main roads. A speed limit of 10 mph around the project area will be maintained. At no time will the RVAAP main roads be blocked by the Subcontractor during remediation activities. Traffic flow must be maintained on at least half of the roadway width at all times. Approval, prior to starting any activity that will obstruct traffic flow, will be obtained from Camp Ravenna, the RVAAP Facility Manager, and SAIC Construction Manager.

11.4 DAILY PLANNING BRIEFINGS

At the start of the project, the Subcontractor will participate in a pre-work briefing on objectives, health and safety, proposed deviations, and project schedule with the SAIC Construction Manager.

In addition to daily tailgate briefings conducted in accordance with the SSHP, the Subcontractor and SAIC will participate in daily planning briefings to determine the plan of action for the work day. This briefing will include at a minimum the following:

- A discussion of the planned activities for the work day;
- Planned area of excavation;
- MEC awareness;
- Weather considerations;
- Deliveries;
- Transportation schedule;
- Scheduled forecast; and
- Issues which would result in an impact to the project.

The USACE COR and RVAAP Facility Manager (or authorized designees) will be invited to attend the pre-work briefing and any daily safety or planning briefings.

11.5 INSPECTION ACTIVITIES

Inspections will be completed to verify acceptability of materials, prevent spills, and assess effectiveness of storm water and dust generation controls. The scope and frequency of each type of inspection is described below.

11.5.1 Spill Control

The SAIC Construction Manager will conduct daily inspections to verify spill equipment is maintained and no spills have occurred. During excavation, if any visually or olfactory indicators suggest the presence of potentially contaminated soil, the employee will report to the SAIC Construction Manager. The Subcontractor will provide all necessary on-site spill equipment (e.g.,

granulated clay, absorbent blankets, PPE, shovels, containers). All on-site workers will maintain good housekeeping practices (as discussed in Section 6.6).

11.5.2 Storm Water Controls

Prior to construction activities, the Subcontractor will install and inspect all storm water controls (including the collection system for any excavation water encountered) and document proper placement in accordance with the requirements of this RD, SWP3 (Attachment B), and associated drawings (Attachment C) and specifications. Any water (e.g., groundwater, storm water) in contact with an open excavation will be collected, containerized, sampled, characterized, and managed by the Subcontractor.

All employees will practice due diligence to prevent any damage to the storm water control measures. The Subcontractor will conduct routine walkovers during normal operations to evaluate the integrity of the storm water controls. Any deficiencies will be immediately corrected and documented in the daily report. Inspection of storm water controls will be performed by the Subcontractor on a daily basis. After remedial activities are completed, storm water controls will be inspected weekly, within 24 hours of a storm event (0.5 inches or greater), and at least every 24 hours during extended rain events.

11.5.3 Dust Control

Dust generation activities may occur during excavation, material handling, and equipment movement on paved and unpaved roads. The Subcontractor will minimize dust generation by keeping vehicles on improved roads, limiting speeds to a 10 mph maximum on the access roads, and application of water for dust suppression purposes as required. Water used for dust control will be clean (e.g., obtained from sources with approval of the SAIC Construction Manager or potable water obtained from an off-site source). The use of additives will not be permitted. Engineering controls will be implemented to minimize the potential for dust generation. The Subcontractor SSHO will conduct daily inspections during representatively normal operating conditions.

11.5.4 Survey

Upon completion of excavation and disposal activities, the floor and walls of the excavation areas at RQL will be surveyed to document the lateral extents of removal activities using a global positioning system (GPS) and the vertical extents (e.g., to verify soil was removed to 1 ft BGS) using a tape measure and documented in a field logbook.

11.6 SPILL RESPONSE

Spills will be responded to as presented in Section 12.1.2 of the FWSHP and Camp Ravenna Spill Plan. In the event of a spill or leak, the employee making the discovery will immediately notify the

SSHO and the SAIC Construction Manager. These spills can include, but are not limited to, releases of fuels, lubricants, and hydraulic fluids.

The SAIC Construction Manager will ensure the spill is reported to RVAAP Army Staff and report any spill over a "reportable quantity" (listed on Table 1 of Appendix A to 49 CFR 172.101) to the Ohio EPA Spill Hotline (1-800-282-9378).

In event the incident occurs on OHARNG property, the SAIC Construction Manager will ensure the spill is reported to Camp Ravenna Operations and documented on a Camp Ravenna Spill Incident Reporting Form. OHARNG will be responsible to contact the Ohio EPA if the spill is over a "reportable quantity."

11.7 CONFIRMATION REQUIREMENTS

11.7.1 Confirmation Sampling

Confirmation of contaminated soil removal will be performed in accordance with Section 4.0 and Section 8.0 of this RD to demonstrate achievement of the remedial CUGs.

11.7.2 Verification of Achievement of Performance Criteria

The SAIC Construction Manager will confirm that remedial actions are complete and that results meet the CUGs. The USACE COR and Ohio EPA Project Coordinator will be notified of the evaluations of results or removal performance (i.e., soil removed to 1 ft BGS or to bedrock). Staging Area samples that do not meet the CUGs will include a description of the additional excavation based on the approach described in Section 8.1. Confirmation sampling results will be included in the Construction Report.

11.8 DOCUMENTATION

11.8.1 Field Documentation

This project will include daily inspection and quality summary reports, which will be signed and dated by the SAIC Construction Manager. These reports will be submitted to the SAIC Project Manager.

The daily reports may include:

- Summary of activities performed at the project site;
- Weather information;
- Inspection activities (e.g., storm water controls, spill-control barriers, equipment staging/fueling areas);
- Departures from the approved RD;
- Problems encountered during field activities;

- Subcontractor submittals; and/or
- Subcontractor certifications (e.g., health and safety records).

Copies of the construction activity forms, checklists and daily reports are included in Attachment D.

11.8.2 Remedial Action Report

Upon completion of remedial activities, a Construction Report will be prepared by SAIC. The Construction Report will document:

- The project was performed in accordance with this RD (i.e., complied with requirements, technical specifications, construction drawings, and other relevant contract documents) and all applicable regulations, including surface water and air regulations;

- Documentation of any approved field variances from this RD (e.g., unforeseen site condition, change in material); and

- Corrective actions and achievement of remedial goals.

12.0 REFERENCES

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Attachment A

Site Safety and Health Plan
for the Remedial Design
for RVAAP-01 Ramsdell Quarry Landfill

Ravenna Army Ammunition Plant
Ravenna, Ohio

GSA Contract No. GS-10F-0076J
Delivery Order No. W912QR-05-F-0033

Prepared for:
U.S. Army Corps of Engineers
600 Martin Luther King, Jr. Place
Louisville, Kentucky 40202

Prepared by:
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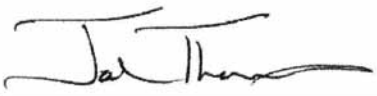
June 17, 2010

APPROVALS

Final

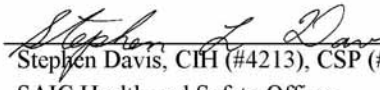
Site Safety and Health Plan
for the Remedial Design
for RVAAP-01 Ramsdell Quarry Landfill
at the
Ravenna Army Ammunition Plant,
Ravenna, Ohio

January 2010



1-21-10

Jed Thomas, P.E. Phone 330-405-5802 — Date
SAIC Project Manager



January 21, 2010

Stephen Davis, CIH (#4213), CSP (#10044), Phone 865-481-4755 — Date
SAIC Health and Safety Officer

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ACRONYMS AND ABBREVIATIONS

A2	Suspected Human Carcinogen
A3	Not Classifiable as Human Carcinogen
ACGIH	American Conference of Governmental Industrial Hygienists
AOC	Area of Concern
BGS	Below Ground Surface
Ca	Potential Occupational Carcinogen
Camp Ravenna	Camp Ravenna Joint Military Training Center
CIH	Certified Industrial Hygienist
COPC	Constituent of Potential Concern
CPR	Cardiopulmonary Resuscitation
CSP	Certified Safety Professional
dBA	Decibels, A-Weighted
E2I	Environment, Energy and Infrastructure
EH&S	Environmental Health and Safety
EM	Engineer Manual
ER	Engineering Regulation
ERA	Ecological Risk Assessment
eV	Electron Volts
FM	Field Manager
FP	Flash Point
FS	Feasibility Study
FWSHP	Facility-Wide Safety and Health Plan
GFCI	Ground Fault Circuit Interrupter
HAZWOPER	Hazardous Waste Operations
HHRA	Human Health Risk Assessment
H&S	Heath and Safety
HTRW	Health Requirements for Radioactive Waste
IDLH	Immediately Dangerous to Life and Health
IDW	Investigation-Derived Waste
IP	Ionization Potential
LEL	Lower Explosive Level
IRP	Installation Restoration Program
MEC	Munitions and Explosives of Concern
mg/kg	Milligrams per Kilogram
MI	Multi-Increment
MSDS	Material Safety Data Sheet
NA	Not Applicable
NGB	National Guard Bureau
NIOSH	National Institute for Occupational Safety and Health
NRR	Noise Reduction Rating
OE	Ordnance and Explosives
OEW	Ordnance and Explosive Waste

ACRONYMS AND ABBREVIATIONS (CONTINUED)

OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
OJT	On-the-Job Training
O&M	Operations and Maintenance
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbon
PE	Professional Engineer
PEL	Permissible Exposure Limit
PID	Photoionization Detector
PPE	Personal Protective Equipment
ppm	Parts per Million
PVC	Polyvinyl Chloride
RA	Remedial Action
RD	Remedial Design
RI	Remedial Investigation
RQL	Ramsdell Quarry Landfill
RVAAP	Ravenna Army Ammunition Plant
RVAAP-01	Ramsdell Quarry Landfill
SAIC	Science Applications International Corporation
SRC	Site Related Compound
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
STEL	Short-Term Exposure Limit
SVOC	Semi-Volatile Organic Compound
TBD	To Be Determined
TLV	Threshold Limit Value
TWA	Time Weighted Average
UEL	Upper Explosive Limit
USACE	U. S. Army Corps of Engineers
VP	Vapor Pressure

1.0 INTRODUCTION

Science Applications International Corporation's (SAIC) formal policy, stated in the Environmental Health and Safety (EH&S) Program manual, is to take every reasonable precaution to protect the health and safety of our employees, the public, and the environment. To this end, the Ravenna Army Ammunition Plant (RVAAP) *Facility-Wide Safety and Health Plan* (FWSHP) (USACE 2001) and this Site Safety and Health Plan (SSHP) collectively set forth the specific procedures required to protect SAIC and SAIC subcontractor personnel involved in the field activities. These plans are driven by requirements contained in the most current revisions of the U.S. Army Corps of Engineers (USACE) *Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities, Engineering Regulation (ER)-385-1-92, Safety and Health Requirements for Munitions and Explosives of Concern, ER-385-1-95,* and the USACE *Safety and Health Manual, Engineer Manual (EM)-385-1-1,* which are available online via the USACE web site. SAIC activities are also subject to the requirements of the SAIC Corporate EH&S Program and associated procedures. All field personnel are required to comply with the requirements of these programs and plans. In addition, subcontractors are responsible for providing their employees with a safe work place and nothing in these plans relieves such subcontractors of this responsibility. Subcontractors must have and use their own safety programs and plans in compliance with applicable regulations.

The FWSHP addresses program issues and hazards and hazard controls common to the entire installation. This SSHP Addendum to the FWSHP serves as the lower tier document addressing the hazards and controls specific to the Remedial Action (RA) at the Ramsdell Quarry Landfill (RQL) (RVAAP-01) area of concern (AOC). Copies of the FWSHP and SSHP Addendum will be present at the work site during all fieldwork.

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2.0 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

2.1 FACILITY DESCRIPTION

When the RVAAP Installation Restoration Program (IRP) began in 1989, RVAAP was identified as a 21,419-acre installation. The property boundary was resurveyed by Ohio Army National Guard (OHARNG) over a 2-year period (2002 and 2003) and the total acreage of the property 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 has been transferred to the National Guard Bureau (NGB) and subsequently licensed to OHARNG for use as a military training site.

The current RVAAP consists of 1,280 acres scattered throughout the OHARNG Camp Ravenna Joint Military Training Center, herein referred to as Camp Ravenna. Camp Ravenna is in northeastern Ohio within Portage and Trumbull Counties, approximately 3 miles (4.8 km) east-northeast of the City of Ravenna and approximately 1 mile (1.6 km) 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 11 miles (17.7 km) long and 3.5 miles (5.6 km) 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 (Figures 16-1 and 16-2). Camp Ravenna is surrounded by several communities: Windham on the north; Garrettsville 6 miles (9.6 km) to the northwest; Newton Falls 1 mile (1.6 km) to the southeast; Charlestown to the southwest; and Wayland 3 miles (4.8 km) 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 industrial facility. The RVAAP IRP encompasses investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP. References to RVAAP in this document are considered to be inclusive of the historical extent of RVAAP, which is inclusive of the combined acreages of the current Camp Ravenna and RVAAP, unless otherwise specifically stated.

2.2 RAMSDELL QUARRY LANDFILL DESCRIPTION

RQL encompasses approximately 14 acres in the northeastern portion of RVAAP. RQL was initially a stone quarry that operated until 1941. During operations, the quarry was excavated 30 to 40 ft (9 to 12 m) below existing grade. The excavated sandstone and quartzite pebble conglomerate was used for road and construction ballast. From 1946 to the 1950s, the bottom of the quarry was used to burn waste explosives from Load Line 1. Reportedly, 18,000 500-lb (225-kg) incendiary or napalm bombs were burned and liquid residues from annealing operations were disposed of in the quarry.

Between 1941 and 1989, the western and southern sections of the abandoned quarry were used for landfill operations. No information is available regarding landfill disposal activities from 1941 to 1976, and no information is available on other activities at the quarry from the 1950s to 1976. Only

nonhazardous soil waste was deposited in RQL from 1976 until it was closed in 1989. In 1978, a portion of the abandoned quarry was permitted as a sanitary landfill by the State of Ohio. The sanitary landfill was closed in 1990 under State of Ohio solid waste regulations. A clay cap was placed on the former permitted landfill area covering approximately four acres of the AOC. The installation and semi-annual monitoring of five groundwater monitoring wells were required for closure of the landfill.

RQL is managed as "Restricted Access" as it includes environmentally sensitive areas (i.e., wetlands), a closed landfill, and may contain munitions and explosives of concern (MEC) and, as a result, will remain Restricted Access in the future. RQL is closed to all normal training and administrative activities. Surveying, sampling, and other essential security, safety, natural resources management, and other directed activities may be conducted at RQL only after authorized personnel have been properly briefed on potential hazards/sensitive areas. Authorized personnel must escort individuals that are unfamiliar with the hazards/restrictions at all times while in the restricted area (USACE 2005b). In addition to MEC, the requirement to protect the landfill cap precludes changes in future land use.

2.3 PREVIOUS ACTIVITIES

A groundwater investigation (USACE 1999) was conducted in July 1998, involving: (1) the installation and sampling of six new monitoring wells; (2) sampling of the existing RQL landfill post-closure monitoring well system; (3) sampling of sediment and surface water within the quarry; and (4) construction of a staff gauge within the main quarry pond. The follow-on phase of the investigation, which extended until July 15, 1999, included: (1) quarterly, dry season and wet season (storm event) sampling of the new monitoring well network and quarry pond surface water; (2) collection of long-term water levels from the new monitoring well network and quarry pond; (3) monthly manual water level measurements from all wells and the pond staff gauge; and (4) collection of precipitation data.

A Phase I Remedial Investigation (RI) (USACE 2005b) was performed in 2003-2004 to determine the nature and extent of contamination in affected media (e.g., surface soils [0 to 1 ft below ground surface (BGS)] and groundwater). Data collected from the RI was used to conduct a quantitative baseline human health risk assessment (HHRA), and ecological risk assessment (ERA), and define the nature and extent of contamination at RQL. The RQL Feasibility Study (FS) (USACE 2006) incorporated these results into the assessment at RQL.

2.4 PROJECT SCOPE

The scope of the RA at RQL is to remove soil from the quarry bottom to bedrock refusal or to a maximum depth of one foot BGS until the concentration of semi-volatile organic compounds (SVOCs) are at or below the following respective remedial cleanup goals: benzo(a)anthracene 13 mg/kg; benzo(b)fluoranthene 13 mg/kg; benzo(a)pyrene 1.3 mg/kg; dibenz(a,h)anthracen 1.3 mg/kg, and indeno(1,2,3-cd)pyrene 13 mg/kg.

Removal quantities estimated from pre-construction multi-increment sampling conducted in May 2009 are presented below in Table 2-1.

Table 2-1. Estimated Removal Quantities for Soil at Ramsdell Quarry Landfill

MI Area – square feet	Volume[a]		Mass[b]
	(cubic feet)	(cubic yards)	(tons)
RQL-034M – 21,066	12,288	455.1	728.2
RQL-037M – 43,819	25,561	946.7	1,514.7
RQL-039M – 5,901	3,442	127.5	204
RQL-040M – 3, 631	2,118	78.5	125.5

[a]Volume was calculated based on a 7-inch average soil depth.
[b]Mass was calculated assuming 1.6 tons per cubic yard soil density.
MI = Multi-Increment RQL = Ramsdell Quarry Landfill

To perform the scope outlined in the Remedial Design (RD), SAIC and subcontractors will perform the following tasks:

- Pre-mobilization activities (e.g., land survey, soil sampling, utility clearance);
- Mobilization (e.g., clearing and grubbing, installing rock construction entrance, equipment movement area, sand bag and soil berms, and storm water controls);
- Perform MEC clearance activities within the construction area;
- Environmental multi-increment (MI) sampling of soil within the quarry;
- Excavation of soil from quarry bottom;
- Transportation and disposal of contaminated soil;
- Confirmation MI sampling of soil;
- Survey of removal areas;
- Site Restoration (e.g., grading, backfilling, seeding, and installing storm water controls); and
- Demobilization.

Potential hazards posed by the planned tasks include injury from ordnance and explosives; lifting, and strain hazards associated with operating soil sampling equipment; heavy equipment; noise; excavation; fuel or decontamination solvent fires; chemical exposure; temperature extremes; stinging/biting insects; poisonous plants; drowning, and snakes.

The potential for chemical overexposure appears to be very low, based on the nature of planned tasks and review of available data. There is some potential for chemical exposures via the inhalation pathway during sampling and excavation activities and dermal contact with contaminated soil. Potential airborne exposures will be visually monitored during ground disturbing activities. Sampling crews will use protective gloves to handle potentially contaminated materials, and, if necessary, the Site Safety and Health Officer (SSHO) will upgrade the required personal protective equipment (PPE) to prevent inhalation and/or dermal contact with potentially contaminated materials. The SSHO will

observe all site tasks during daily safety inspections and will use professional judgment and appropriate monitoring results to determine if upgrading PPE is required. A detailed analysis of these hazards and specific appropriate controls is presented in Table 3-2.

This RA will be performed in Level D PPE and using chemical-resistant gloves when handling potentially-contaminated materials. If one of several action levels is exceeded or the potential for increased risk becomes apparent during the investigation, protective procedures, including protective clothing, will be upgraded as necessary by the SSHO.

2.5 CONTAMINANTS

Table 2-2 lists constituents of potential concern (COPCs) and their respective maximum concentrations detected in soil and dry sediment samples (discrete and MI) during the RI. Inclusion in this table indicates the potential to encounter a contaminant during the remedial activities, but it does not necessarily indicate that the contaminant is present in sufficient quantity to pose a health risk to workers.

Table 2-2. RQL Maximum Concentrations of Constituents of Potential Concern

Analyte	Units	RQL Maximum Detect
Metals		
Arsenic	mg/kg	30
Lead	mg/kg	3710
Semi-Volatile Organics		
Benz(a)anthracene	mg/kg	1400
Benzo(a)pyrene	mg/kg	960
Benzo(b)fluoranthene	mg/kg	1200
Benzo(k)fluoranthene	mg/kg	580
Carbazole	mg/kg	460
Chrysene	mg/kg	1000
Dibenz(a,h)anthracene	mg/kg	180
Indeno(1,2,3-cd)pyrene	mg/kg	630

RQL = Ramsdell Quarry Landfill

Data is from *Phase I Remedial Investigation Report for the Ramsdell Quarry Landfill (RVAAP-01).* Ravenna Army Ammunition Plant. September 2005, and *Final Feasibility Study for Ramsdell Quarry Landfill at Ravenna Army Ammunition Plant in Ravenna, Ohio.* March 2006.

Airborne contaminate calculations were conducted using the maximum detected concentrations. Results, with the exception of lead, were too low to represent an airborne exposure health risk. Lead concentrations in dust are approximately equivalent to the nuisance dust permissible exposure limit (PEL) of 10 mg/kg indicating if visible dust is generated in RQL-039M during remedial activities there is a potential exposure to lead at the Occupational Safety and Health Administration (OSHA) PEL.

3.0 HAZARD/RISK ANALYSIS

The purpose of the task hazard/risk analysis is to identify and assess potential hazards that may be encountered by personnel and to prescribe required controls. Table 3-1, a general checklist of hazards that may be posed by this project, indicates whether a particular major type of hazard is present. If additional tasks or significant hazards are identified during the work, this document will be modified by addendum or field change order to include the additional information.

Table 3-1. Hazards Inventory

Yes	No	Hazard
	X	Confined space entry
X		Excavation entry (excavation will be entered)[1]
X		Heavy equipment (drill rigs, backhoe)
X		Fire and explosion (fuels)
X		Electrical shock (utilities and tools)
X		Exposure to chemicals (contaminants and chemical tools)
X		Temperature extremes
X		Biological hazards (poison ivy, Lyme disease, West Nile disease)
	X	Radiation or radioactive contamination
X		Noise (excavation equipment, powered auger, drill rig)
X		Drowning
X		MEC (potential to encounter unexploded ordnance)

[1]The limits of the excavation are within the boundaries of the former quarry and are relatively level. Soil thicknesses above bedrock are on average seven inches thick indicating there is no risk for slope failure during excavation activities.

MEC = Munitions and Explosives of Concern

Specific tasks are as follows:

- Excavation using heavy equipment performed by the Subcontractor;
- Soil sampling with scoops performed in the excavation areas by SAIC;
- Vegetation clearing with chainsaws, machetes, and sling blades, as required, performed by the Subcontractor;
- Surveying performed by the Subcontractor;
- Investigation-derived waste (IDW) handling and disposition performed by the Subcontractor; and
- Sampling and excavation equipment decontamination performed by both SAIC and the Subcontractor.

3.1 POTENTIAL EXPOSURES

Prior sampling results indicate that the primary contaminants of concern at RQL are SVOCs and lead. Table 3-2 contains information on the potential contaminants, as well as the reagents and chemicals that will be used for the project. It is important to note that the contaminants listed in Table 3-2 have been

detected in a number of locations at RVAAP and might be expected to occur at any former operations area. Exposure to chemical tools, such as corrosive sample preservatives, field laboratory reagents, or flammable fuels, is a possibility and will be controlled through standard safe handling practices.

3.2 TASK-SPECIFIC HAZARD ANALYSIS

Table 3-3 presents task-specific hazards, relevant hazard controls, and required monitoring, if appropriate, for all of the planned tasks.

Table 3-2. Potential Exposures

Chemical[a]	TLV/PEL/STEL/IDLH[b]	Health Effects/ Potential Hazards[c]	Chemical and Physical Properties[c]	Exposure Route(s)[c]
Benzo(a)pyrene (and other similar PAHs)	TLV/TWA: 0.1 mg/m^3, A2 PEL/TWA: 0.02 mg/m^3 IDLH: 80 mg/m^3	Potential carcinogen per NIOSH, dermatitis, bronchitis	Black or dark-brown amorphous residue FP: NA; IP: NA	Inhalation Contact
Lead	TLV/TWA: 0.1 mg/m^3, A2 PEL/TWA: 0.05 mg/m^3 IDLH: 100 mg/m^3	Irritation of eyes, anemia, weight loss, hypotension, kidney disease, abdominal pain and constipation	A heavy, ductile, soft gray solid FP: NA; IP: NA UEL:NA; LEL: NA	Inhalation Ingestion Contact
Gasoline (used for fuel)	TLV/TWA: 300 ppm, A2 IDLH: Ca	Potential carcinogen per NIOSH, dizziness, eye irritation, dermatitis	Liquid with aromatic odor FP: -45°F; VP: 38-300 mm	Inhalation Ingestion Absorption Contact
Hydrochloric acid (potentially used to preserve water samples or for equipment decontamination)	TLV: 5 ppm ceiling IDLH: 50 ppm	Irritation of eyes, skin, respiratory system	Liquid; VP: fuming; IP: 12.74 eV; FP: none	Inhalation Ingestion Contact
Liquinox (used for decontamination)	TLV/TWA: None	Inhalation may cause local irritation to mucus membranes	Yellow odorless liquid (biodegradable cleaner); FP: NA	Inhalation Ingestion
Methanol (potentially used for equipment decontamination)	TLV/TWA: 200 ppm Skin notation IDLH: 6000 ppm	Irritation of eyes, skin, respiratory system, headache, optic nerve damage	Liquid; VP: 96 mm; IP: 10.84 eV; FP: 52°F UEL: 36% LEL: 6.0 %	Inhalation Absorption Ingestion Contact

[a]The potential chemicals were obtained from the *Phase I Remedial Investigation Report*s for RQL (USACE 1998, 2005a and 2005b).

[b]From 2008 Threshold Limit Values, *American Conference of Governmental Industrial Hygienists*.

[c]From *NIOSH Guide to Chemical Hazards* web site.

A2 = suspected human carcinogen
A3 = not classifiable as a human carcinogen
Ca = potential occupational carcinogen
eV = Electron Volts
FP = Flash Point
IDLH = Immediately Dangerous to Life and Health
IP = Ionization Potential
LEL = Lower Explosive Limit
mm = Millimeters
NA = Not Applicable
NIOSH = National Institute for Occupational Safety and Health
PAH = Polycyclic Aromatic Hydrocarbons
PEL = Permissible Exposure Limit
ppm = Parts Per Million
RQL = Ramsdell Quarry Landfill
STEL = Short-Term Exposure Limit
TLV = Threshold Limit Value
TWA = Time-Weighted Average
UEL = Upper Explosive Limit
USACE = U.S. Army Corp of Engineers
VP = Vapor Pressure

Table 3-3. Hazards Analysis

Safety and Health Hazards	Controls	Monitoring Requirements
Civil Surveys and Visual Surveys in Potentially Contaminated Areas		
General safety hazards (moving equipment, slips, falls)	Level D PPE: long pants, shirts with sleeves, safety glasses, safety shoes or boots, and hard hats if overhead hazards are present (see Section 5.0 of the FWSHP). Site-specific training, buddy system, proper housekeeping.	Daily safety inspections
Contact with ordnance and explosives (OE)	On-site training in ordnance recognition for all field personnel. Clearance of site by MEC personnel for intrusive work. Continuous escort by MEC Avoidance Subcontractor personnel when in areas with potential to encounter OE. Withdrawal of all non-MEC personnel if ordnance or suspected ordnance is discovered. Sampling of stations having known or suspected (i.e., red soil or raw product) explosives >10% (100,000 mg/kg) to be performed by MEC Avoidance Subcontractor personnel following applicable MEC safety requirements.	Visual and instrument surveys by MEC technician following requirements of *Ordnance and Explosive Waste (OEW) Activities, Engineer Regulations (ER)-385-1-92.*
Exposure to chemicals	Nitrile or similar gloves for contact with potentially contaminated material. Gloves will be disposed after single use. Wash face and hands and any other exposed areas prior to taking anything by mouth. Hazardous waste site operations training and medical clearance. Site training must include hazards and controls for exposure to site contaminants and chemicals used on-site. Material safety data sheets (MSDSs) on-site. All chemical containers labeled to indicate contents and hazard.	Inspections by field manager (FM) to verify compliance with requirements. FM to verify documentation of hazardous waste training and medical surveillance.
Biological hazards (bees, ticks, Lyme disease, histoplasmosis, wasps, snakes, West Nile Virus)	PPE (boots, work clothes). Insect repellant on boots, pants, and elsewhere, as necessary, to repel ticks and mosquitoes. Pant legs tucked into boots or otherwise closed to minimize tick entry. Inspect for ticks during the day and at the end of each workday (see Section 9.0 of FWSHP). Avoidance of accumulations of bird or bat droppings (see Section 9.0 of FWSHP).	Visual survey
Vehicle accidents	Compliance with E2I EH&S Procedure 110 “Vehicle Operation” to include verification of current drivers licenses, use of seat belts when vehicle is in motion, daily (undocumented) vehicle safety inspection, compliance with applicable laws and regulations, and defensive driving.	Verification of valid drivers licenses by FM.
Temperature extremes	Administrative controls (see Section 8.0 of FWSHP). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (see Section 8.0 of FWSHP). Chilled drinks if temperature exceeds 70°F and warm drinks if temperature is below 50°F.	Temperature measurements at least twice daily. Pulse rates at the start of each break if wearing impermeable clothing

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Severe weather	Locate nearest severe weather shelter/strong structure before beginning fieldwork. Suspend fieldwork if lighting within 10 miles of site or tornado warning issued. Do not work in areas subject to flash flooding (arroyo, ditch, etc.) if rain is forecast in immediate area or upstream of site.	Visual observation for lightning, strong winds, or heavy rain. Check forecast prior to starting work daily.
Drowning	When possible, the water in the former quarry will be released or pumped to a portable water tank when accumulation poses a potential drowning hazard. Personal flotation device will be worn when working within 6 ft of water deeper than 3 ft.	The water depth in the former quarry will be monitored.
Soil Sampling Using Scoops		
General safety hazards (manual lifting, slips, falls)	Level D PPE: long pants, shirts with sleeves, safety boots, safety glasses, and work gloves for manual work (see Section 5.0 of FWSHP). Buddy system. Site-specific training. Proper housekeeping. SAIC personnel will stay clear of operating heavy equipment.	Daily site safety inspections
Excavation entry	Personnel will not enter the excavation area while equipment is operational. Excavation subcontractor must operate to their own excavation procedure, which must be as protective as EH&S Procedure 160 "Excavation Safety". Trenches 5 ft deep or deeper must be shored or sloped if personnel will enter.	Daily safety inspections and visual surveys
Contact with MEC	On-site training in ordnance recognition for all field personnel. Clearance of site by MEC personnel for intrusive work. Continuous escort by MEC Avoidance Subcontractor personnel when in areas with potential to encounter OE. Withdrawal of all non-MEC personnel if ordnance or suspected ordnance is discovered. Sampling of stations having known or suspected (i.e., red soil or raw product) explosives >10% (100,000 mg/kg) to be performed by MEC Avoidance Subcontractor personnel following applicable MEC safety requirements.	Visual and instrument surveys by MEC technician following requirements of *Safety and Health Requirements for Munitions and Explosive (MEC), ER-385-1-95*
Exposure to chemicals	Level D PPE plus nitrile or equivalent gloves for contact with contaminated material. Wash face and hands prior to taking anything by mouth. Stay upwind of any dust-generating activities. Dust suppression techniques (such as wetting area) will be implemented if visual airborne dust is observed. Hazardous waste site operations training and medical clearance. Site training must include hazards and controls for site contaminants and all chemicals used on-site. MSDSs for chemical tools on-site. Chemical containers labeled to indicate contents and hazard.	Visual observations for dust during soil sampling activities. FM will verify documentation of required training and medical surveillance.

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Temperature extremes	Administrative controls (see Section 8.0 of FWSHP). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (see Section 8.0 of FWSHP). Chilled drinks if temperature exceeds 70°F and warm drinks if temperature is below 50°F.	Temperature measurements at least twice daily. Pulse rates at the start of each break if wearing impermeable clothing.
Severe weather	Locate nearest severe weather shelter/strong structure before beginning fieldwork. Suspend fieldwork if lighting within 10 miles of site or tornado warning issued. Do not work in areas subject to flash flooding (arroyo, ditch, etc.) if rain is forecast in immediate area or upstream of site.	Visual observation for lightning, strong winds, or heavy rain. Check forecast prior to starting work daily.
Vehicle accidents	Compliance with E2I EH&S Procedure 110 "Vehicle Operation" to include verification of current drivers licenses, use of seat belts when vehicle is in motion, daily (undocumented) vehicle safety inspection, compliance with applicable laws and regulations, and defensive driving.	Verification of valid drivers licenses by FM.
Lifting injuries	Compliance with E2I EH&S Procedure 150 "Manual Lifting" to limiting individual lifts by SAIC personnel to 50 pounds.	Verification/observation of lifting by SAIC personnel by FM.
Biological hazards (bees, ticks, Lyme disease, histoplasmosis, wasps, snakes, West Nile Virus)	PPE (boots, work clothes). Insect repellant on boots, pants, and elsewhere, as necessary, to repel ticks and mosquitoes. Pant legs tucked into boots or otherwise closed to minimize tick entry. Snake chaps if working in overgrown areas. Inspect for ticks during the day and at the end of each workday (see Section 9.0 of FWSHP). Avoidance of accumulations of bird or bat droppings (see Section 9.0 of FWSHP).	Visual survey
Drowning	When possible, the water in the former quarry will be released or pumped to a portable water tank when accumulation poses a potential drowning hazard. Personal flotation device will be worn when working within 6 ft of water deeper than 3 ft.	The water depth in the former quarry will be monitored.

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Vegetation Clearing with Chainsaws, Machetes, Sling Blades and Heavy Equipment		
General safety hazards (contact with sharp edges, slips, falls)	Clearing to be conducted by subcontractor in compliance with their H&S program and procedures which must satisfy USACE and SAIC requirements. Level D PPE: long pants, shirts with sleeves, safety boots, safety glasses, plus heavy-duty work gloves and hard hat (see Section 5.0 of FWSHP). Buddy system. Site-specific training. Proper housekeeping. Only experienced operators. Personnel operating brush-clearing tools must maintain separation of at least 15 ft. Machetes equipped with lanyard and lanyard looped around wrist. Tools must be inspected daily and taken out of service if damaged. Exclusion zone if there is a potential for entry of unauthorized personnel.	Daily site safety inspections. Inspection of hand and power tools by subcontractor.
Chainsaw kickback and related hazards	Chainsaw chaps and face shield as additional PPE. Saws must have automatic chain brake or kickback device. Idle speed adjusted so chain does not move when idling. Only experienced operators may use chainsaw. Saws must not be used to cut above shoulder height. Saws must be held with both hands when operating. Additional requirements at 385-1-1 Section 31.	Daily inspection
Noise (chainsaw)	Hearing protection $\geq$ NRR 25 within 25 ft (7.6 m) of operating chainsaw or heavy equipment unless specific monitoring indicates noise exposure of less than 85 dBA.	Daily safety inspections
Fire (fuels)	Fuels stored in safety cans with flame arrestors. Bonding (metal to metal) and grounding during fuel transfers. Fuel storage areas marked with no smoking or open flames signs. Fire extinguishers in all fuel use areas. Gasoline-powered equipment turned off and allowed to cool for at least 5 minutes prior to fueling.	Daily safety inspection
Contact with MEC	On-site training in ordnance recognition for all field personnel. Clearance of site by MEC personnel for intrusive work. Continuous escort by MEC Avoidance Subcontractor personnel when in areas with potential to encounter OE. Withdrawal of all non-MEC personnel if ordnance or suspected ordnance is discovered. Sampling of stations having known or suspected (i.e., red soil or raw product) explosives >10% (100,000 mg/kg) to be performed by MEC Avoidance Subcontractor personnel following applicable MEC safety requirements.	Visual and instrument surveys by MEC technician following requirements of *Safety and Health Requirements for Munitions and Explosive (MEC), ER-385-1-95*

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Exposure to chemicals	Level D PPE plus nitrile or equivalent gloves for contact with contaminated material. Wash face and hands prior to taking anything by mouth. Stay upwind of any dust-generating activities. Dust suppression techniques (such as wetting area) as required. Hazardous waste site operations training and medical clearance. Site training must include hazards and controls for site contaminants and all chemicals used on-site. MSDSs for chemical tools on-site. Chemical containers labeled to indicate contents and hazard.	Visual observations for dust during vegetation clearing activities and daily safety inspections. FM will verify documentation of training and medical clearance.
Temperature extremes	Administrative controls (see Section 8.0 of FWSHP). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (see Section 8.0 of FWSHP). Chilled drinks if temperature exceeds 70°F and warm drinks if temperature drops below 50°F.	Temperature measurements at least twice per day. Pulse rates at the start of each break if wearing impermeable clothing.
Severe weather	Locate nearest severe weather shelter/strong structure before beginning fieldwork. Suspend fieldwork if lighting within 10 miles of site or tornado warning issued. Do not work in areas subject to flash flooding (arroyo, ditch, etc.) if rain is forecast in immediate area or upstream of site.	Visual observation for lightning, strong winds, or heavy rain. Check forecast prior to starting work daily.
Vehicle accidents	Compliance with E2I EH&S Procedure 110 "Vehicle Operation" to include verification of current drivers licenses, use of seat belts when vehicle is in motion, daily (undocumented) vehicle safety inspection, compliance with applicable laws and regulations, and defensive driving.	Verification of valid drivers licenses by FM.
Lifting injuries	Compliance with E2I EH&S Procedure 150 "Manual Lifting" to limiting individual lifts by SAIC personnel to 50 pounds.	Verification/observation of lifting by SAIC personnel by FM.
Biological hazards (bees, ticks, Lyme disease, histoplasmosis, wasps, snakes, West Nile Virus)	PPE (boots, work clothes). Insect repellant on boots, pants, and elsewhere, as necessary, to repel ticks and mosquitoes. Pant legs tucked into boots or otherwise closed to minimize potential for tick entry. Snake chaps if working in overgrown areas. Inspect for ticks during the day and at the end of each workday (see Section 9.0 of FWSHP). Avoidance of accumulations of bird or bat droppings (see Section 9.0 of FWSHP).	Visual survey

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Investigation-Derived Waste Handling		
General hazards (lifting equipment, manual lifting, slips)	Level D PPE: long pants, shirts with sleeves, safety glasses, safety shoes or boots, heavy-duty gloves for materials handling, and hard hat if overhead hazards are present (see Section 5.0 of FWSHP). Buddy system. Site-specific training. Proper housekeeping. Unnecessary personnel will stay well clear of operating equipment. Functional back-up alarm on fork trucks, Bobcats, trucks, etc. Ravenna Operations and Maintenance (O&M) contractor personnel will provide any required fork truck services in the IDW staging area (Building 1036). IDW movement from field sites to Building 1036 will be conducted by the drilling subcontractor using a backhoe equipped with forks and drum dollys. No personnel allowed under lifted loads. Lifts of greater than 50 lbs will be made with two or more personnel or with lifting equipment. Hazardous waste safety training. Compliance with EM 385-1-1 Sections 14 and 16.	Daily safety inspections of operations. Daily inspection of equipment to verify brakes and operating systems are in proper working condition.
Contact with MEC	On-site training in ordnance recognition for all field personnel. Clearance of site by MEC personnel for intrusive work. Continuous escort by MEC Avoidance Subcontractor personnel when in areas with potential to encounter OE. Withdrawal of all non-MEC personnel if ordnance or suspected ordnance is discovered. Sampling of stations having known or suspected (i.e., red soil or raw product) explosives >10% (100,000 mg/kg) to be performed by MEC Avoidance Subcontractor personnel following applicable MEC safety requirements.	Visual and instrument surveys by MEC technician following requirements of *Safety and Health Requirements for Munitions and Explosive (MEC), ER-385-1-95*
Exposure to chemicals	Level D PPE plus nitrile or equivalent gloves for contact with contaminated material. Wash face and hands prior to taking anything by mouth. Hazardous waste site operations training and medical clearance. Site training must include hazards and controls for exposure to site contaminants and chemicals used on-site.	Visual observations for dust during activities and daily safety inspections.
Vehicle accidents	Compliance with E2I EH&S Procedure 110 “Vehicle Operation” to include verification of current drivers licenses, use of seat belts when vehicle is in motion, daily (undocumented) vehicle safety inspection, compliance with applicable laws and regulations, and defensive driving.	Verification of valid drivers licenses by FM.
Lifting injuries	Compliance with E2I EH&S Procedure 150 “Manual Lifting” to limiting individual lifts by SAIC personnel to 50 pounds.	Verification/observation of lifting by SAIC personnel by FM.

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Fire (vehicle fuels and flammable contaminants)	Fuels stored in safety cans with flame arrestors. Bonding (metal to metal) and grounding during fuel transfers. Fuel storage areas marked with no smoking or open flames signs. Gasoline-powered equipment will be shut down and allowed to cool for 5 minutes before fueling. Fire extinguishers in all fuel use areas.	Daily safety inspection
Noise	Hearing protection within 25 ft (7.6 m) of any noisy drum moving equipment unless equipment-specific monitoring indicates exposures less than 85 dBA.	Daily safety inspections
Biological hazards (bees, ticks, Lyme disease, histoplasmosis, wasps, snakes, West Nile Virus)	PPE (boots, work clothes). Insect repellant on pants, boots, and elsewhere, as necessary, to repel ticks and mosquitoes. Pant legs tucked into boots or otherwise closed to minimize tick entry. Snake chaps if working in overgrown areas. Inspect for ticks during the day and at the end of each workday (see Section 9.0 of FWSHP). Avoidance of accumulations of bird or bat droppings (see Section 9.0 of FWSHP)	Visual survey
Electric shock	Identification and clearance of overhead utilities. GFCI for all electrical hand tools.	Visual survey of all work areas
Temperature extremes	Administrative controls (see Section 8.0 of FWSHP). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (see Section 8.0 of FWSHP). Chilled drinks if temperature exceeds 70°F and warm drinks if temperature drops below 50°F.	Temperature measurements at least twice daily. Pulse rates at the start of each break if wearing impermeable clothing.
Severe weather	Locate nearest severe weather shelter/strong structure before beginning fieldwork. Suspend fieldwork if lighting within 10 miles of site or tornado warning issued. Do not work in areas subject to flash flooding (arroyo, ditch, etc.) if rain is forecast in immediate area or upstream of site.	Visual observation for lightning, strong winds, or heavy rain. Check forecast prior to starting work daily.
Equipment Decontamination (Water Washing)		
General equipment decontamination hazards (water, slips, falls, equipment handling)	Level D PPE plus nitrile or PVC gloves (see Section 5.0 of FWSHP). Face shield and Saranax or rain suit when operating steam washer. Site-specific training. Proper housekeeping.	Daily safety inspections
Noise (spray washer)	Hearing protection when washer is operating unless equipment-specific monitoring indicates that exposure is less than 85 dBA.	None
Exposure to chemicals	Level D PPE plus nitrile or equivalent gloves for contact with contaminated material. Wash face and hands prior to taking anything by mouth. Minimal contact. Hazardous waste site operations training and medical clearance. Site training must include hazards and controls for exposure to site contaminants and chemicals used on-site. MSDSs on-site. All chemical containers labeled to indicate contents and hazard.	None

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Electric shock	Portable electrical hand tools and equipment must be connected through functional GFCIs.	Verification by FM
Vehicle accidents	Compliance with E2I EH&S Procedure 110 "Vehicle Operation" to include verification of current drivers licenses, use of seat belts when vehicle is in motion, daily (undocumented) vehicle safety inspection, compliance with applicable laws and regulations, and defensive driving.	Verification of valid drivers licenses by FM.
Lifting injuries	Compliance with E2I EH&S Procedure 150 "Manual Lifting" to limiting individual lifts by SAIC personnel to 50 pounds.	Verification/observation of lifting by SAIC personnel by FM.
Temperature extremes	Administrative controls (see Section 8.0 of FWSHP). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (see Section 8.0 of FWSHP). Chilled drinks if temperature exceeds 70°F and warm drinks if temperature drops below 50°F.	Temperature measurements at least twice a day. Pulse rates at the start of each break if wearing impermeable clothing.
Severe weather	Locate nearest severe weather shelter/strong structure before beginning fieldwork. Suspend fieldwork if lighting within 10 miles of site or tornado warning issued. Do not work in areas subject to flash flooding (arroyo, ditch, etc.) if rain is forecast in immediate area or upstream of site.	Visual observation for lightning, strong winds, or heavy rain. Check forecast prior to starting work daily.
Site Preparation, Excavation, Truck Loading, and Site Restoration using Heavy Equipment		
General Safety hazards associated with excavation equipment	Excavation subcontractor must have and operate to their own safety programs, procedures, and practices. Excavation subcontractor will develop and implement procedures pertaining to excavation safety and subsurface asset and hazard avoidance. SAIC will review these procedures and ensure they are at least as protective as SAIC's E2I EH&S Procedure 130 "Subsurface Asset and Hazard Avoidance" and Procedure 160 "Excavation Safety". Compliance with E2I EH&S Procedure 130 "Subsurface Asset and Hazard Avoidance" will be conducted prior to excavation activities to prevent contact with buried utilities and/or OE. Compliance with E2I EH&S Procedure 160 "Excavation Safety" will include a subcontractor excavation competent person, documented review of Procedure 160 by SAIC FM, daily inspection of excavation, no entry in trenches deeper than 4 ft without additional controls. Unnecessary personnel will stay well clear of operating equipment. Functional back-up alarm. Exclusion zone around excavation areas. Only experienced operators will be allowed to operate equipment. Hazardous waste safety training. Level D PPE including hardhat (see Section 5.0).	Daily safety inspections of operations. Initial and at least weekly inspections of excavation equipment.

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Contact with MEC	On-site training in ordnance recognition for all field personnel. Clearance of site by MEC personnel for intrusive work. Continuous escort by MEC Avoidance Subcontractor personnel when in areas with potential to encounter OE. Withdrawal of all non-MEC personnel if ordnance or suspected ordnance is discovered. Sampling of stations having known or suspected (i.e., red soil or raw product) explosives >10% (100,000 mg/kg) to be performed by MEC Avoidance Subcontractor personnel following applicable MEC safety requirements.	Visual and instrument surveys by MEC technician following requirements of *Safety and Health Requirements for Munitions and Explosive (MEC), ER-385-1-95*
Fire (vehicle fuels and flammable contaminants)	Fuels stored in safety cans with flame arrestors. Bonding and grounding during fuel transfers. Fuel storage areas marked with no smoking or open flames signs. Fire extinguishers in all fuel use areas.	Daily safety inspection. Combustible gas indicator if buried organic material or other source of flammable gas suspected.
Noise	Hearing protection within 25 ft (7.6 m) of backhoe or similar equipment unless equipment-specific monitoring indicates exposures less than 90 dBA.	Daily safety inspections.
Exposure to chemicals	Level D PPE plus nitrile or equivalent gloves for contact with contaminated material. Wash face and hands prior to taking anything by mouth. Stay upwind of any dust-generating activities. Dust suppression techniques (such as wetting area) if visible airborne dust is observed. Hazardous waste site operations training and medical clearance. Site training must include hazards and controls for site contaminants and all chemicals used on-site. MSDSs for chemical tools on-site. Chemical containers labeled to indicate contents and hazard.	Visual observations for dust during soil disturbing activities and daily safety inspections. FM will verify documentation of training and medical surveillance.
Biological hazards (bees, ticks, Lyme disease, histoplasmosis, wasps, snakes)	PPE (boots, work clothes). Insect repellant, as necessary. Pant legs tucked into boots or otherwise closed to minimize tick entry. Inspect for ticks during the day and at the end of each work day (See Section 9.0 of the FWSHP). Avoidance of accumulations of bird or bat droppings (See Section 9.0).	Visual survey
Electric shock	Identification and clearance of overhead and underground utilities per E2I EH&S Procedure 130.	Visual survey of all work areas

Table 3-3. Hazards Analysis (continued)

Safety and Health Hazards	Controls	Monitoring Requirements
Temperature extremes	Administrative controls (see Section 8.0 of the FWSHP). Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area (See Section 8.0 of the FWSHP). Chilled drinks if temperature exceeds 70°F and warm drinks if temperature drops below 50°F.	Temperature measurements at least twice daily. Pulse rates at the start of each break if wearing impermeable clothing.
Drowning	When possible, the water in the former quarry will be released or pumped to a portable water tank when accumulation poses a potential drowning hazard. Personal flotation device will be worn when working within 6 ft of water deeper than 3 ft.	The water depth in the former quarry will be monitored.
Severe weather	Locate nearest severe weather shelter/strong structure before beginning fieldwork. Suspend fieldwork if lighting within 10 miles of site or tornado warning issued. Do not work in areas subject to flash flooding (arroyo, ditch, etc.) if rain is forecast in immediate area or upstream of site.	Visual observation for lightning, strong winds, or heavy rain. Check forecast prior to starting work daily.

dBA = Decibels, A-Weighted
E2I = Energy Environment & Infrastructure
EH&S = Environmental Health and Safety
EM = Engineer Manual
ER = Engineering Regulation
FM = Field Manager
FWSHP = Facility-Wide Safety and Health Plan
GFCI = Ground-Fault Circuit Interrupter
H&S = Health and Safety
IDW = Investigation-Derived Waste
MEC = Munitions and Explosives of Concern
MSDS = Material Safety Data Sheet
NRR= Noise Reduction Rating
OE = Ordnance and Explosives
O&M = Operations and Maintenance
PPE = Personal Protective Equipment
PVC = Polyvinyl Chloride
RVAAP = Ravenna Army Ammunition Plant
SAIC = Science Applications International Corporation

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4.0 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

This section presents the personnel (and their associated telephone numbers) responsible for site safety and health and emergency response. Table 4-1 identifies the SAIC and subcontractor staff who will fill key roles. See the Facility-Wide Safety and Health Plan (FWSHP) for information on the roles and responsibilities of key positions.

Table 4-1. Staff Organization

Position	Name	Phone
SAIC Health and Safety Manager	Steve Davis CIH, CSP	(865)481-4755
SAIC Project Manager	Jed Thomas, P.E.	(330)405-5802
SAIC Construction Manager[1]	Richard Sprinzl	(330)405-5808
Subcontractor Construction Supervisor	TBD	TBD
Subcontractor Site Safety and Health Officer[2]	TBD	TBD
MEC Avoidance Subcontractor	TBD	TBD

[1] Construction Manager is equivalent to the Field Operations Manager in the FWSHP.

[2] Subcontractor Site Safety and Health Officer will be SSHO for all remedial activities.

CIH= Certified Industrial Hygienist

CSP = Certified Safety Professional

MEC = Munitions and Explosives of Concern

P.E. = Professional Engineer

TBD = To Be Determined

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5.0 TRAINING

Training requirements, from Section 4.0 of the FWSHP, are summarized in Table 5-1 and in Table 3-3. All field personnel working within the AOC shall be first aid and cardiopulmonary resuscitation (CPR) trained.

Table 5-1. Training Requirements

Training	Worker	Supervisor	Site Visitor (exclusion zone)
HAZWOPER (40-hr, 3-day OJT)	√	√	√
HAZWOPER Annual Refresher (8 hr)	√	√	√
HAZWOPER Supervisors Training (8 hr)	—	√	—
American Red Cross Standard First Aid (5.5 hr) and CPR	√	√	—
General Hazard Communication Training	√	√	√
Respiratory Protection Training (required only if respirators are worn)	√	√	√
Hearing Conservation Training (for workers in hearing conservation program)	√	√	√
Pre-entry Briefing	√	√	√
Site-Specific Hazard Communication (contained in pre-entry briefing)	√	√	√
Safety Briefing (daily and whenever conditions or tasks change)	√	√	√
Equipment-Specific Training (Equipment Operators)	√	—	—
OSHA Excavation Competent Person Training[1]	—	—	—

[1] There is no potential for slope failure during excavation activities given the excavation will be limited by the depth to bedrock (approximately 7 inches). There is no requirement for an OSHA Excavation Competent Person for excavations less than four ft.

— = not required

√ = required.

CPR = Cardiopulmonary Resuscitation

HAZWOPER = Hazardous Waste Site Operations.

OJT = On-the-Job Training

OSHA = Occupational Safety and Health Administration

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6.0 PERSONAL PROTECTIVE EQUIPMENT

General guidelines for selection and use of PPE are presented in the Section 5.0 of the FWSHP. Specific PPE requirements for this work are presented in the hazard/risk analysis section (Section 3.0).

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7.0 MEDICAL SURVEILLANCE

Medical surveillance requirements, as presented in Section 6.0 of the FWSHP, are summarized in Table 7-1.

Table 7-1. Medical Surveillance Requirements

Baseline	Routine	Overexposure	Termination
Prior to work assessment	Every 12 months, unless greater frequency is deemed appropriate by attending physician. Not to exceed 2-year interval.	Upon developing symptoms or where exposure limits have been exceeded or suspected to have been exceeded.	Upon termination or re-assignment.

All medical exams shall include (see Section 6.2 of the FWSHP):

- Medical/work history;
- Physical exam by physician;
- Audiometry;
- Blood screening and blood count;
- Chest x-ray, as specified by physician;
- Electrocardiogram, as specified by physician;
- Spirometry; and
- Urinalysis.

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8.0 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

Assessment of airborne chemical concentrations will be performed, as appropriate, to ensure that exposures do not exceed acceptable levels. Action levels, with appropriate responses, have been established for this monitoring. In addition to the specified monitoring, the SSHO may perform or require additional monitoring, such as organic vapor monitoring in the equipment decontamination area or personnel exposure monitoring for specific chemicals. The deployment of monitoring equipment will depend on the activities being conducted and the potential exposures. The minimum monitoring requirements and action levels are presented in Table 8-1.

Most of the RA field activities are not expected to pose airborne exposure hazards for the following reasons:

- Work will be performed in open areas with natural ventilation;
- Dust suppression (wetting) will be implemented and work will be stopped if visible airborne dust is observed; and
- The most probable contaminants (metals and polycyclic aromatic hydrocarbons [PAHs]) are materials with relatively low vapor pressures and exposure can be controlled through dust suppression techniques.

It is not anticipated to perform air monitoring of the breathing zone using a photoionization detector or equivalent during excavation and sampling. However, the SSHO will examine site conditions and will contact the Health and Safety Manager and initiate monitoring if there is any indication of potential airborne exposure.

Table 8-1. Monitoring Requirements and Action Limits

Hazard or Measured Parameter	Area	Interval	Limit	Action	Tasks
Airborne organics with PID or equivalent	Breathing zone [14 in.] in front of employee's shoulder	From 1 to 3 ft below ground surface and if site conditions, such as discolored soil or chemical smells, indicate that monitoring is necessary	<5 ppm >5 ppm	Level D Withdraw and evaluate • evaluate need for PPE upgrade • identify contaminants • notify project manager and H&S manager	None, unless site inspections indicate that monitoring is needed.
Noise	All areas perceived as noisy	Any area where there is some doubt about noise levels	85 dBA TWA and	Require the use of hearing protection	Hearing protection will be worn within the exclusion zone, around power augers, or other motorized equipment
Visible airborne dust potentially containing SRCs	All	Continuously	Visible dust generation	Stop work; use dust suppression techniques such as wetting surface	All

dBA = decibels, A-weighted
H&S = health and safety
PAH = polycyclic aromatic hydrocarbon
PID = photoionization detector
PPE = personal protective equipment
ppm = parts per million
SRC = site-related contaminant (e.g., PAHs, arsenic)
TWA = time weighted average

9.0 HEAT/COLD STRESS MONITORING

General requirements for heat/cold stress monitoring are contained in Section 8.0 of the FWSHP.

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10.0 STANDARD OPERATING SAFETY PROCEDURES

Standard operating safety procedures, including excavation and trench safety are described in Section 9.7 of the FWSHP. Dust generation may occur during material excavation, handling, and transportation. Prior to the start of any ground/soil disturbance activity (e.g., clearing and grubbing, excavating, grading), the area will be misted with water to prevent the generation of dust. The SSHO will monitor ground disturbance activities to ensure dust is not being generated. In the event that any dust becomes visible, the activity will cease and the area will be misted with water. During instances of high winds resulting in excessive dust, and dust control measures are determined ineffective, work stoppage and/or additional PPE may be required.

In addition, all access roads, and work areas within the project boundaries will be maintained free from soil that could cause a hazard or nuisance. Dust control will be maintained by keeping vehicles on improved roads, maintaining the posted speed limit, and applying water as required. The Subcontractor will employ water spraying/misting for dust control if airborne dust is observed. Water used for dust control will be clean (e.g., obtained from RVAAP sources with approval of the RVAAP Facility Manger, or potable water from an off-site source). The use of additives will not be permitted.

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11.0 SITE CONTROL MEASURES

Site control measures are described in Section 10.0 of the FWSHP. No formal site control is expected to be necessary for this work, as the work areas are somewhat remote and bystanders are not anticipated. The RVAAP installation is not open to the public, and only authorized personnel are allowed at RQL. However, an exclusion zone will be established around the excavation as described in Sections 9.7 and 10.1 of the FWSHP. If the SSHO determines that a potential exists for unauthorized personnel to approach within 25 ft of a work zone or otherwise be at risk due to proximity, then additional site controls will be established as described in the FWSHP.

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12.0 PERSONNEL HYGIENE AND DECONTAMINATION

Personnel hygiene and decontamination requirements are described in Section 11.0 of the FWSHP.

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13.0 EMERGENCY PROCEDURES AND EQUIPMENT

Emergency contacts, telephone numbers, directions to the nearest medical facility (Figure 16-3), and general procedures can be found in Section 12.0 the FWSHP. Table 13-1 presents emergency phone numbers used during normal working hours (Monday through Friday, 8:00 am to 4:00 pm). All on-site emergencies must be coordinated through **Guard Post 1 [(330) 358-2017]** who will coordinate the response. The SAIC Construction Manager (defined as the Field Operations Manager in the FWSHP) will remain in charge of all SAIC and subcontractor personnel during emergency activities. The SAIC field office will serve as the assembly point if it becomes necessary to evacuate the remedial location. During mobilization, the SSHO will verify that the emergency information in the FWSHP is correct.

Each field team shall have a cellular phone and/or a 2-way radio capable of contacting Guard Post 1 for communications purposes.

During field operations all on-site personnel shall have CPR/first aid training.

Table 13-1. Emergency Phone Numbers

Position	Phone
RVAAP Guard Post 1 (Police, Fire, Emergency Medical)	(330)358-2017
Hospital (Robinson Memorial, Ravenna)	(330) 297-2449/0811
OHARNG Range Control	(614) 336-6041
Camp Ravenna Garrison Commander	(614) 336-6560
RVAAP Facility Manager Mark Patterson	Office: (330) 358-7311
RVAAP Operation and Maintenance Contractor Jim McGee, VISTA Sciences.	Office: (330) 358-3005
USACE Tom Chanda	Office: (502) 315-6868
Ohio EPA Todd Fisher	Office: (330) 963-1148
SAIC Project Manager, Jed Thomas	Office: (330) 405-5802 Cell: (216) 214-2599
SAIC Health and Safety Personnel, Steve Davis CIH, CSP Heather Miller	Office: (865) 481-4755 Cell: (865) 414-9035 Office: (330) 405-5814 Cell: (330) 573-8671

RVAAP = Ravenna Army Ammunition Plant
USACE = U.S. Army Corps of Engineers
Ohio EPA = Ohio Environmental Protection Agency
SAIC = Science Applications International Corporation, Inc.
CIH= Certified Industrial Hygienist
CSP = Certified Safety Professional

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14.0 LOGS, REPORTS, AND RECORD KEEPING

Logs, reports, and record keeping requirements are described in Section 13.0 of the FWSHP.

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15.0 REFERENCES

American Conference of Governmental Hygienists (ACGIH) 2008. Threshold Limit Values. 2008.

NIOSH (National Institute for Occupational Safety and Health) 2005. *NIOSH Pocket Guide to Chemical Hazards*. September 2005.

USACE (U.S. Army Corps of Engineers). *Safety and Occupational Health Requirements for Hazardous, Toxic and Radioactive Waste (HTRW),* Engineering Regulation (ER)-385-1-92, May 2007.

USACE. *Safety and Health Requirements for Munitions and Explosives of Concern (MEC),* ER-385-1-95, March 2007.

USACE. *Safety and Health Requirements Manual,* Engineer Manual (EM)-385-1-1, November 2008.

USACE 1998. *Phase I Remedial Investigation Report for High-Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio,* DACA62-94-D-0029, DO Nos. 0010 and 0022, Final, February 1998.

USACE 1999. *Initial Phase Report on the Groundwater Investigation, Ramsdell Quarry Landfill, Ravenna Army Ammunition Plant, Ravenna, Ohio,* DACA27-97-D-0025, D.O. 003, Final, January.

USACE 2001. *Facility Wide Safety and Health Plan for Environmental Investigations at the Ravenna Army Ammunition Plant, Ravenna, Ohio,* DACA62-00-D-0001, D.O. CY02, March 2001.

USACE 2005a. *Phase I Remedial Investigation December 2004 Follow-On Groundwater Sampling at Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio.* Contract Number F44650-D-99-0007, June 2005.

USACE 2005b. *Phase I Remedial Investigation Report for the Ramsdell Quarry Landfill (RVAAP-01).* Ravenna Army Ammunition Plant, Ravenna, Ohio. Delivery Order W912QR-05-F-0033, September 2005.

USACE 2006. *Final Feasibility Study (FS) for Ramsdell Quarry Landfill (RVAAP-01) at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. March 2006.

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16.0 FACILITY AND HOSPITAL MAPS

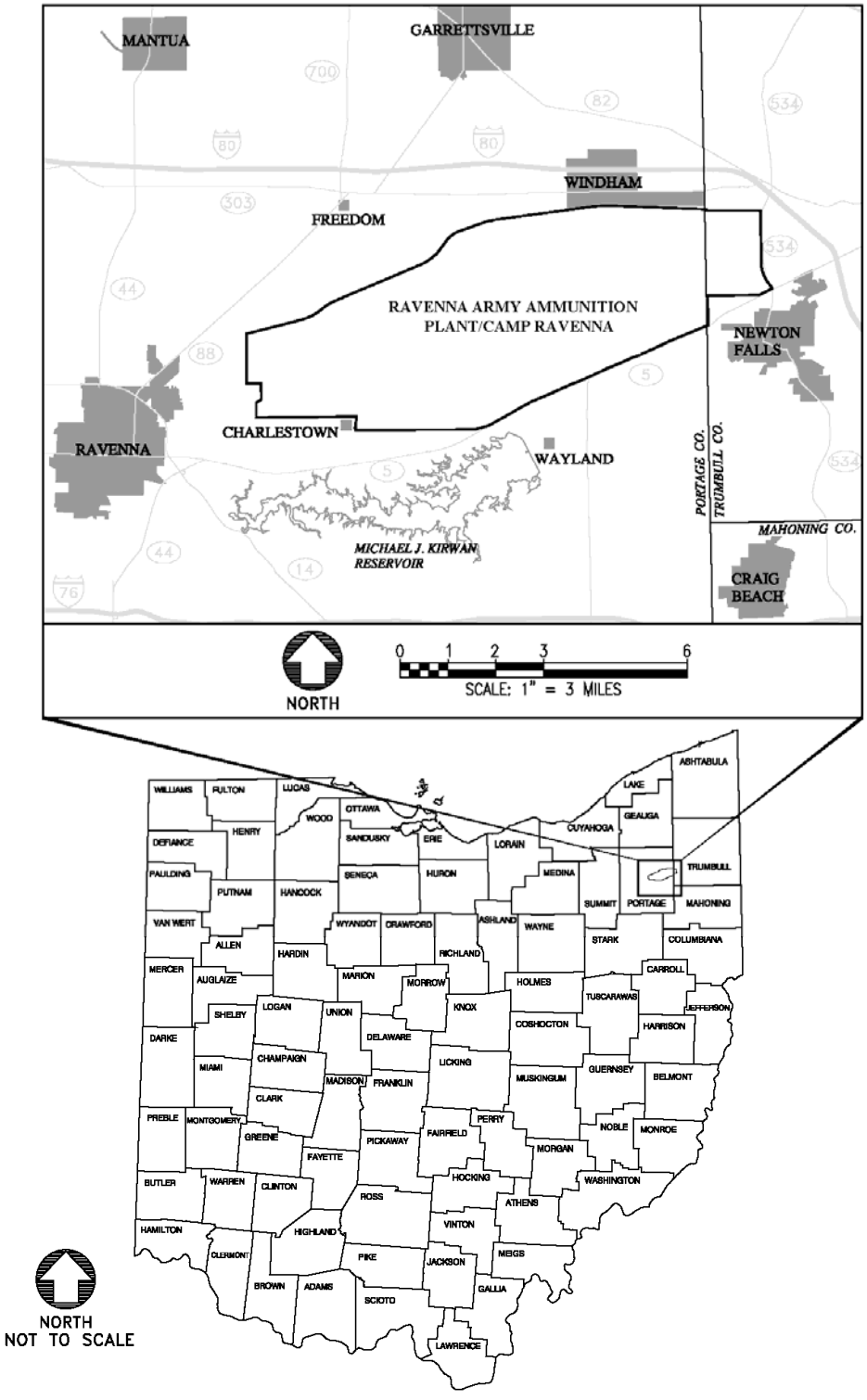

Figure 16-1. General Location and Orientation of RVAAP/Camp Ravenna

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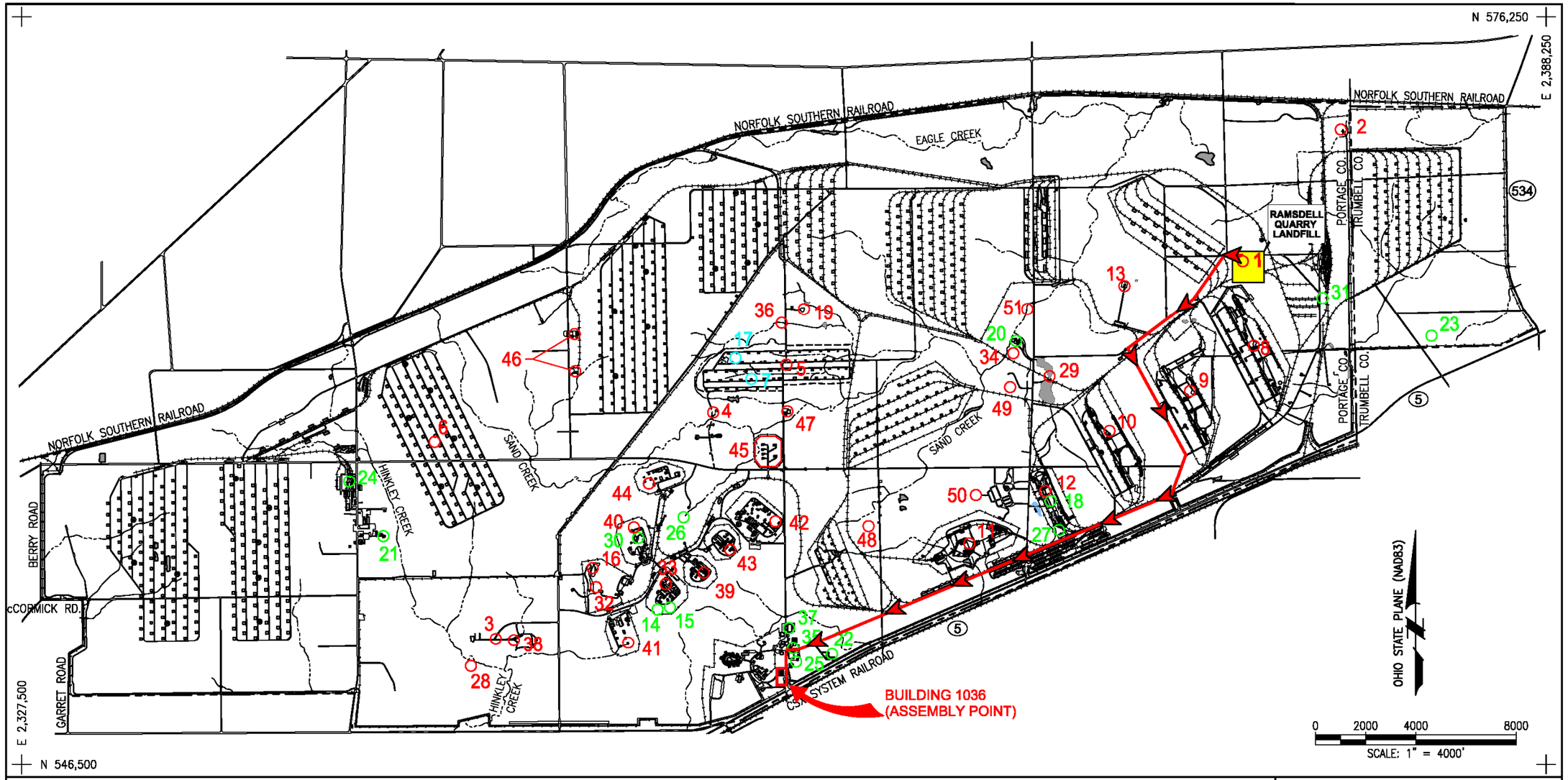

LEGEND:

1 ..... RAMSDELL QUARRY LANDFILL
2 ..... ERIE BURNING GROUNDS
3 ..... DEMOLITIONS AREA #1
4 ..... DEMOLITIONS AREA #2
5 ..... WINKLEPECK BURNING GROUNDS
6 ..... C BLOCK QUARRY
7 ..... BUILDING 1601 HAZARDOUS WASTE STORAGE
8 ..... LOAD LINE 1 AND DILUTION/SETTLING POND
9 ..... LOAD LINE 2 AND DILUTION/SETTLING POND
10 ..... LOAD LINE 3 AND DILUTION/SETTLING POND
11 ..... LOAD LINE 4 AND DILUTION/SETTLING POND
12 ..... LOAD LINE 12
13 ..... BUILDING 1200 AND DILUTION/SETTLING POND
14 ..... LOAD LINE 6, EVAPORATION UNIT
15 ..... LOAD LINE 6, TREATMENT PLANT
16 ..... QUARRY LANDFILL/FORMER FUZE & BOOSTER BURNING PITS
17 ..... DEACTIVATION FURNACE
18 ..... LOAD LINE 12 PINK WASTEWATER TREATMENT
19 ..... LANDFILL NORTH OF WINKLEPECK BURNING GROUND
20 ..... SAND CREEK SEWAGE TREATMENT PLANT
21 ..... DEPOT SEWAGE TREATMENT PLANT
22 ..... GEORGE ROAD SEWAGE TREATMENT PLANT
23 ..... UNIT TRAINING SITE WASTE OIL TANK
24 ..... RESERVE UNIT MAINTENANCE AREA WASTE OIL TANK
25 ..... BUILDING 1034 MOTOR POOL WASTE OIL TANK
26 ..... FUZE BOOSTER AREA SETTLING TANKS
27 ..... BUILDING 854–PCB STORAGE
28 ..... MUSTARD AGENT BURIAL SITE
30 ..... LOAD LINE 7 PINK WASTEWATER TREATMENT PLANT
31 ..... ORE PILE RETENTION POND
32 ..... 40– AND 60–MM FIRING RANGE
33 ..... FIRESTONE TEST FACILITY
34 ..... SAND CREEK DISPOSAL ROAD LANDFILL
35 ..... 1037 BUILDING–LAUNDRY WASTEWATER SUMP
36 ..... PISTOL RANGE
37 ..... PESTICIDE STORAGE BUILDING T–4452
38 ..... NACA TEST AREA
39 ..... LOAD LINE 5/FUZE LINE 1
40 ..... LOAD LINE 7/BOOSTER LINE 1
41 ..... LOAD LINE 8/BOOSTER LINE 2
42 ..... LOAD LINE 9/DETONATOR LINE
43 ..... LOAD LINE 10/PERCUSSION ELEMENT
44 ..... LOAD LINE 11/ARTILLERY PRIMER
45 ..... WET STORAGE AREA
46 ..... BUILDINGS F–15 AND F–16
47 ..... BUILDING T–5301 DECONTAMINATION
48 ..... ANCHOR TEST AREA
49 ..... CENTRAL BURN PITS
50 ..... ATLAS SCRAP YARD
51 ..... DUMP ALONG PARIS–WINDHAM ROAD
..... CERCLA
..... RCRA
..... OTHER REGULATORY
..... RAILROAD TRACKS
..... FENCELINE
..... PROPERTY BOUNDARY
..... STREAM OR CREEK
..... EMERGENCY EGRESS ROUTE

US Army Corps of Engineers Louisville District

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE, KENTUCKY

RVAAP/CAMP RAVENNA
RAVENNA, OHIO

DRAWN BY:	REV. NO./DATE:	CAD FILE:
P. HOLM	REV.2/07–02–09	/09019/DWGS/H29FIG16–2

Figure 16-2. RVAAP/Camp Ravenna Site Map and Egress Route

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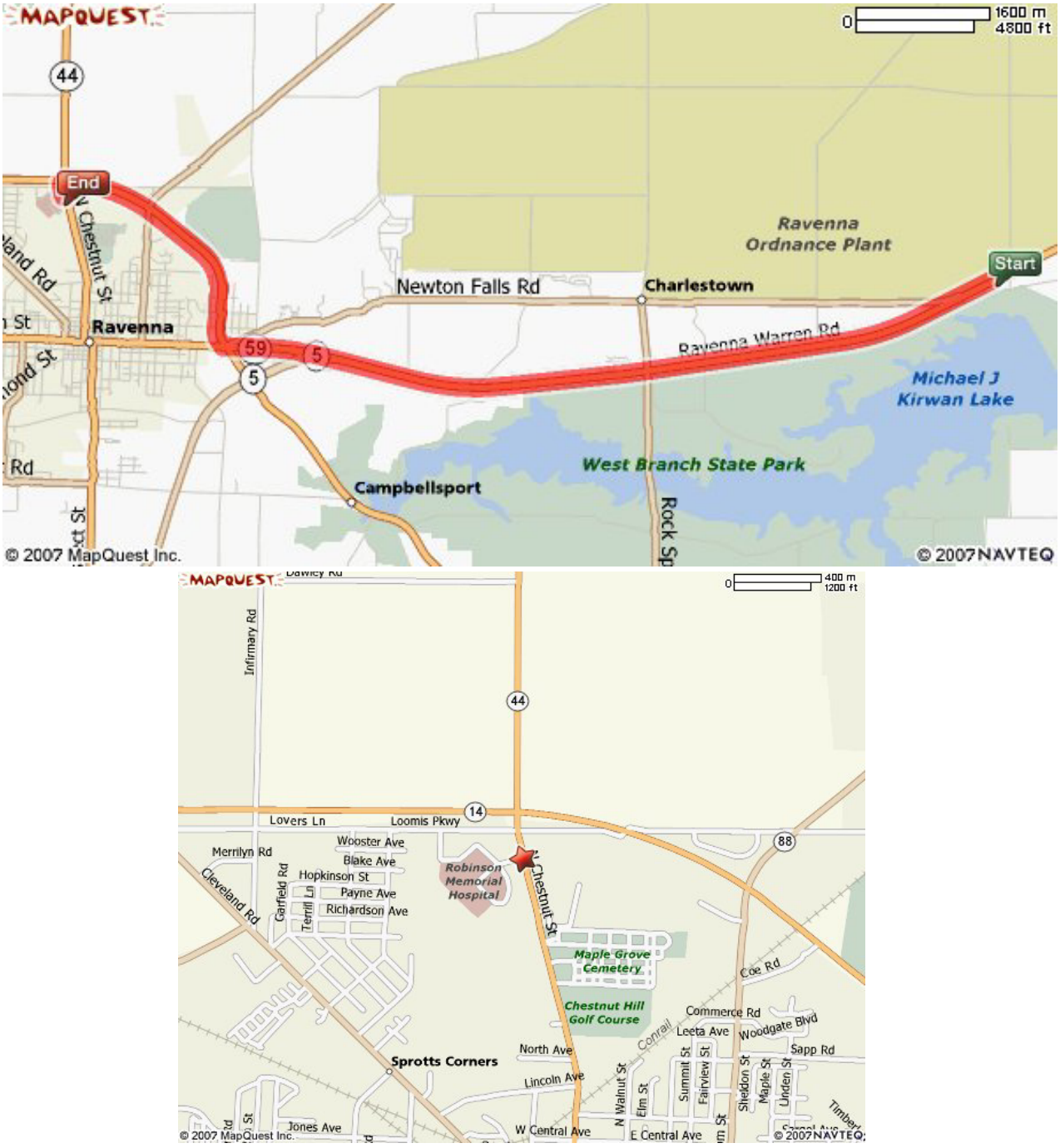

Figure 16-3. Route Map to Pre-Notified Medical Facility

Robinson Memorial Hospital
6847 N. Chestnut Street
Ravenna, Ohio
(330) 297-0811

Directions: West on State Route 5. Stay straight onto OH-59 West. Turn Right onto OH-14/OH-44. Turn Left onto North Chestnut St.

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Attachment B

Storm Water Pollution Prevention Plan for the Remedial Design for RVAAP-01 Ramsdell Quarry Landfill

Ravenna Army Ammunition Plant,
Ravenna, Ohio

GSA Contract No. GS-10F-0076J
Delivery Order No. W912QR-05-F-0033

Prepared for:
U.S. Army Corps of Engineers
600 Martin Luther King, Jr. Place
Louisville, Kentucky 40202

Prepared by:
Science Applications International Corporation
8866 Commons Boulevard
Twinsburg, Ohio 44087

June 17, 2010

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ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of Highway and Transportation Officials
amsl	Above Mean Sea Level
AOC	Area of Concern
ASTM	American Society for Testing Materials
BGS	Below Grade Surface
BMP	Best Management Practice
Camp Ravenna	Camp Ravenna Joint Military Training Center
COC	Constituent of Concern
COR	Contract Officer Representative
CQAP	Construction Quality Assurance Plan
DFFO	Director's Final Findings and Orders
FWSHP	Facility-Wide Safety and Health Plan
GSA	General Services Administration
IDW	Investigation-Derived Waste
IRP	Installation Restoration Program
ISCP	Installation Spill Contingency Plan
LUC	Land Use Control
MEC	Munitions and Explosives of Concern
MI	Multi-Increment
NGB	National Guard Bureau
NOI	Notice of Intent
NOT	Notice of Termination
ODNR	Ohio Department of Natural Resources
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
ORC	Ohio Revised Code
PBC	Performance-Based Contract
RA	Remedial Action
RD	Remedial Design
RQL	Ramsdell Quarry Landfill
RVAAP	Ravenna Army Ammunition Plant
RVAAP-01	Ramsdell Quarry Landfill
SAIC	Science Applications International Corporation
SWP3	Storm Water Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers

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1.0 INTRODUCTION

Science Applications International Corporation (SAIC) has been contracted by the U.S. Army Corps of Engineers (USACE) - Louisville District to provide environmental services in support of six high priority areas of concern (AOCs) at the Ravenna Army Ammunition Plant (RVAAP) in Ravenna, Ohio. This work is being performed under a Performance-Based Contract (PBC) in accordance with U.S. General Services Administration (GSA) Environmental Advisory Services Contract GS-10-F-0076J. In addition, planning and performance of all work elements is being conducted in accordance with the requirements of the Director's Final Findings and Orders (DFFO) dated June 10, 2004 (Ohio EPA 2004).

The Remedial Design (RD) describes the implementation process for the selected remedy for contaminated soil at Ramsdell Quarry Landfill (RQL). The remedial activities that will be performed as specified in the RD include approximately 2.5 acres. USACE/SAIC is required to develop this Storm Water Pollution Prevention Plan (SWP3) under Ohio Environmental Protection Agency (Ohio EPA) Permit No. OHC000003.

In accordance with Ohio Revised Code (ORC) 6111 and provisions of the federal Water Pollution Control Act, this SWP3 has been prepared for proposed construction activities related to the construction effort. The SWP3 is prepared in general conformance with Ohio EPA Authorization for Storm Water Discharges Associated with Construction Activities permit requirements. Proposed Best Management Practices (BMPs) shall conform to the Ohio Department of Natural Resources (ODNR) *Rainwater and Land Development* (ODNR 2006). USACE shall submit a complete and accurate Notice of Intent (NOI) application form and appropriate fee at least 21 days prior to the commencement of construction activity. In addition, the procured subcontractor shall submit a co-permittee NOI application form prior to the commencement of construction activity. This SWP3 is Attachment B of the RD and references the RD design drawings (Attachment C). This SWP3 addresses control measures to be implemented as part of this design to minimize storm water pollution from the construction activities.

1.1 FACILITY DESCRIPTION

When the RVAAP Installation Restoration Program (IRP) began in 1989, RVAAP was identified as a 21,419-acre installation. The property boundary was resurveyed by Ohio Army National Guard (OHARNG) over a 2-year period (2002 and 2003) and the total acreage of the property 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 has been transferred to the National Guard Bureau (NGB) and subsequently licensed to OHARNG for use as a military training site.

The current RVAAP consists of 1,280 acres scattered throughout the OHARNG Camp Ravenna Joint Military Training Center, herein referred to as Camp Ravenna. Camp Ravenna is in northeastern Ohio within Portage and Trumbull Counties, approximately 3 miles (4.8 km) east-northeast of the City of Ravenna and approximately 1 mile (1.6 km) 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 11 miles (17.7 km) long and 3.5 miles (5.6 km) 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 (Figures 1-1 and 1-2). Camp Ravenna is surrounded by several communities: Windham on the north; Garrettsville 6 miles (9.6 km) to the northwest; Newton Falls 1 mile (1.6 km) to the southeast; Charlestown to the southwest; and Wayland 3 miles (4.8 km) 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 industrial facility. The RVAAP IRP encompasses investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP. References to RVAAP in this document are considered to be inclusive of the historical extent of RVAAP, which is inclusive of the combined acreages of the current Camp Ravenna and RVAAP, unless otherwise specifically stated.

1.2 RAMSDELL QUARRY LANDFILL DESCRIPTION AND HISTORY

RQL (designated as RVAAP-01) is situated in the northeastern portion of the RVAAP and encompasses approximately 14 acres. The AOC is bounded to west and south by a former railroad track, to the north by a road. A closed sanitary landfill occupies the southern portion of RQL and the northern portion consists of an approximately 10 acre bowl-shaped, former quarry.

Quarrying activities at the AOC began in 1941; these activities resulted in the area being excavated down 30 to 40 feet (ft) below existing grade. The excavated sandstone and quartzite pebble conglomerate was used for road and construction ballast. From 1946 to the 1950s, the bottom of the quarry was used to burn waste explosives from Load Line 1. Reportedly, 18,000 500-lb (225-kg) incendiary or napalm bombs were burned and liquid residues from annealing operations were disposed of in the quarry.

Between 1941 and 1989, the western and southern sections of the abandoned quarry were used for landfill operations. No information is available regarding landfill disposal activities from 1941 to 1976, and no information is available on other activities at the quarry from the 1950s to 1976. Only nonhazardous solid waste was deposited in RQL from 1976 until it was closed in 1989. In 1978, a portion of the abandoned quarry was permitted as a sanitary landfill by the state of Ohio. The sanitary landfill was closed in 1990 under state of Ohio solid waste regulations. A clay cap was placed on the former permitted landfill area covering approximately four acres of the AOC.

Prominent site features of the AOC include: the former quarry, the closed landfill, drainage ditches along the road, a landfill access road, and a former rail line. Vegetation communities at RQL include new field, scrub shrub, patches of forests and a palustrine emergent wetland (at the quarry bottom). The land surface generally slopes toward the former quarry and elevations range from approximately 955 to 990 ft above mean sea level (amsl). Surface water runoff drains into the quarry, which does not

have a defined surface outflow and is hydrologically isolated. Water levels within the quarry bottom vary widely depending on the season and rainfall and the depth is typically less than four feet. At times the quarry bottom is completely dry. The drainage ways and ditch lines, located along access roads and the rail line, only contain water during rain events. Former quarry operations resulted in the removal of much of the original soil and surface soil within the quarry is on average seven inches thick with bedrock exposed in some areas.

1.3 RAMSDELL QUARRY LANDFILL REMEDIAL ACTIVITIES

RQL has had multiple site investigations performed to determine the nature and extent of chemical contamination at the site. Contaminated soil was identified within the quarry bottom at RQL. The contaminated soil was characterized for waste disposal prior to remedial activities in accordance with Section 4 of the RD. Table 1-1 presents estimated waste quantities required for removal from RQL.

Table 1-1. Estimated Quantities of Waste

Waste Material	Surface Area (square yards)	In situ Amounts	
		Volume[a] (cubic yards)	Weight[b] (tons)
Surface Soil (RQL-034M)	2341	455	728
Surface Soil (RQL-037M)	4869	947	1515
Surface Soil (RQL-039M)	656	128	204
Surface Soil (RQL-040M)	403	78	125

[a]Excavation to depth of 7 inches below ground surface (BGS).
[b]Assumes 1.6 tons per cubic yard soil density.
M = Multi-increment
RQL = Ramsdell Quarry Landfill

Remedial action (RA) will be performed at RQL in accordance with the RD. The following activities summarize elements of the RA:

- Pre-mobilization activities (land survey, soil sampling and herbicide application);
- Munitions and explosives of concern (MEC) anomaly investigation and removal (if needed);
- Clearing and grubbing;
- Installation of construction support areas and storm water controls;
- Excavation of contaminated soil from the RQL;
- Transportation and off-site disposal of contaminated soil at a permitted facility;
- Confirmation of the removal of contaminated soil;
- Restore excavated and construction impacted areas to neighboring or original contours and conditions;
- Implement post-remedial action land use controls (LUCs);
- Perform post construction weekly monitoring (wetland areas and storm water control); and
- Removal of storm water controls.

A modified Category 2 wetland is present in the quarry at RQL. Remedial activities at RQL will have a short-term impact on the wetland area. The resulting post-remedial improvement to the wetland should out weight the short-term construction impacts. Storm water controls will be implemented at construction support areas up gradient of the wetland until 70 percent density of vegetation is achieved in these areas (post-construction).

During the remedial activities there is a likelihood that water will be within the limits of excavation, the prediction of the quantity of water is not possible given it is contingent on multiple variables (e.g., season, rain quantities, evaporation rate). In the event water is within the limits of excavation it will be removed prior to the start of excavation activities. Storm water collected during remedial activities will be managed as follows:

1. Storm water that enters the quarry that can be diverted/bermed from entry into the excavation area will be pumped, filtered and land applied.

2. Storm water that comes into contact with the open excavation areas will be containerized in a portable water tank with secondary containment and sampled to determine ultimate disposition.

Once restoration activities are complete; storm water will not be diverted and will naturally enter the quarry. Any water remaining within the diversion berms (not land applied) will be released slowly during removal of the berms to prevent rutting of the newly backfilled and seeded areas and allowed to accumulate at the natural low points within the quarry.

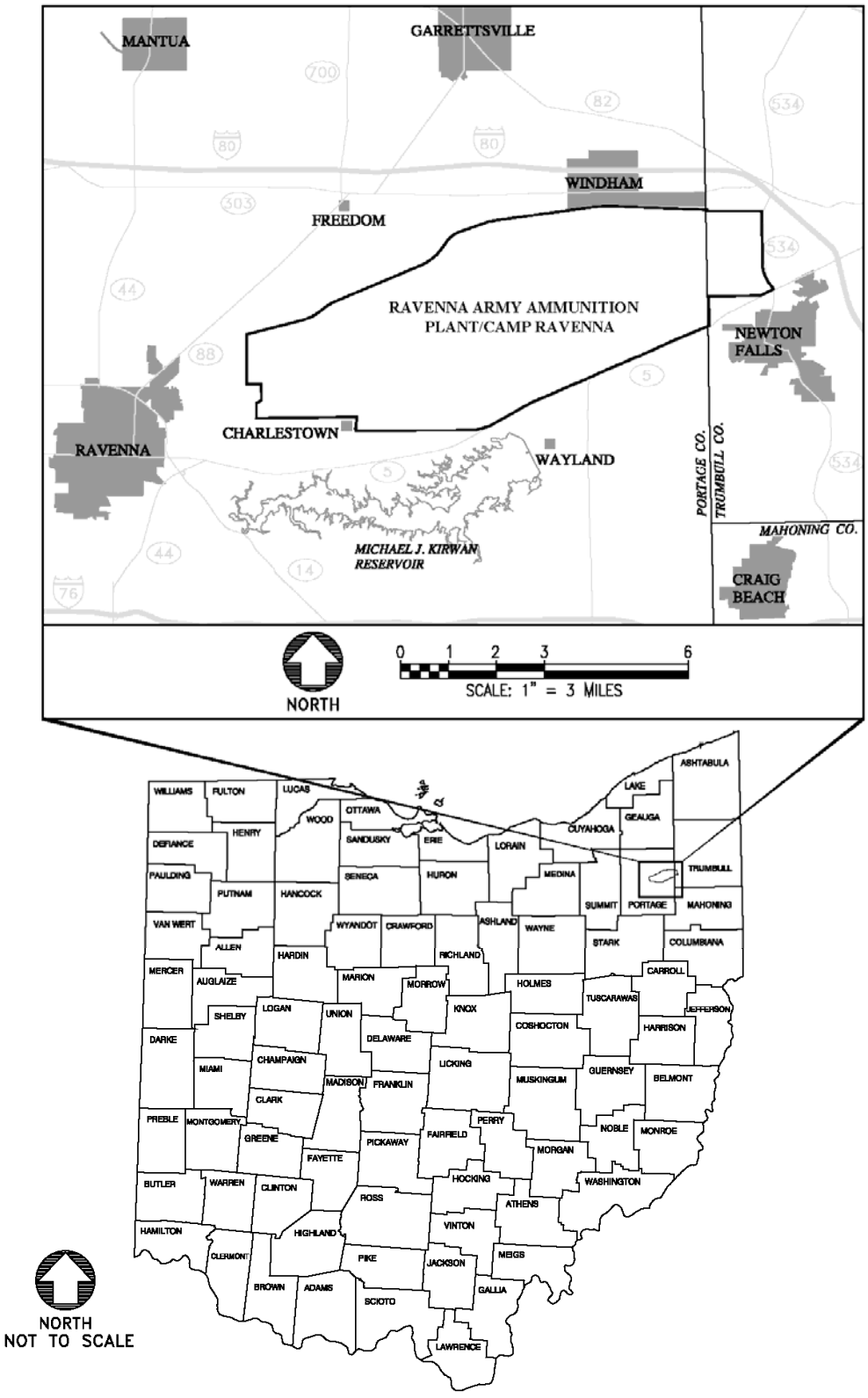

Figure 1-1. General Location and Orientation of RVAAP/Camp Ravenna

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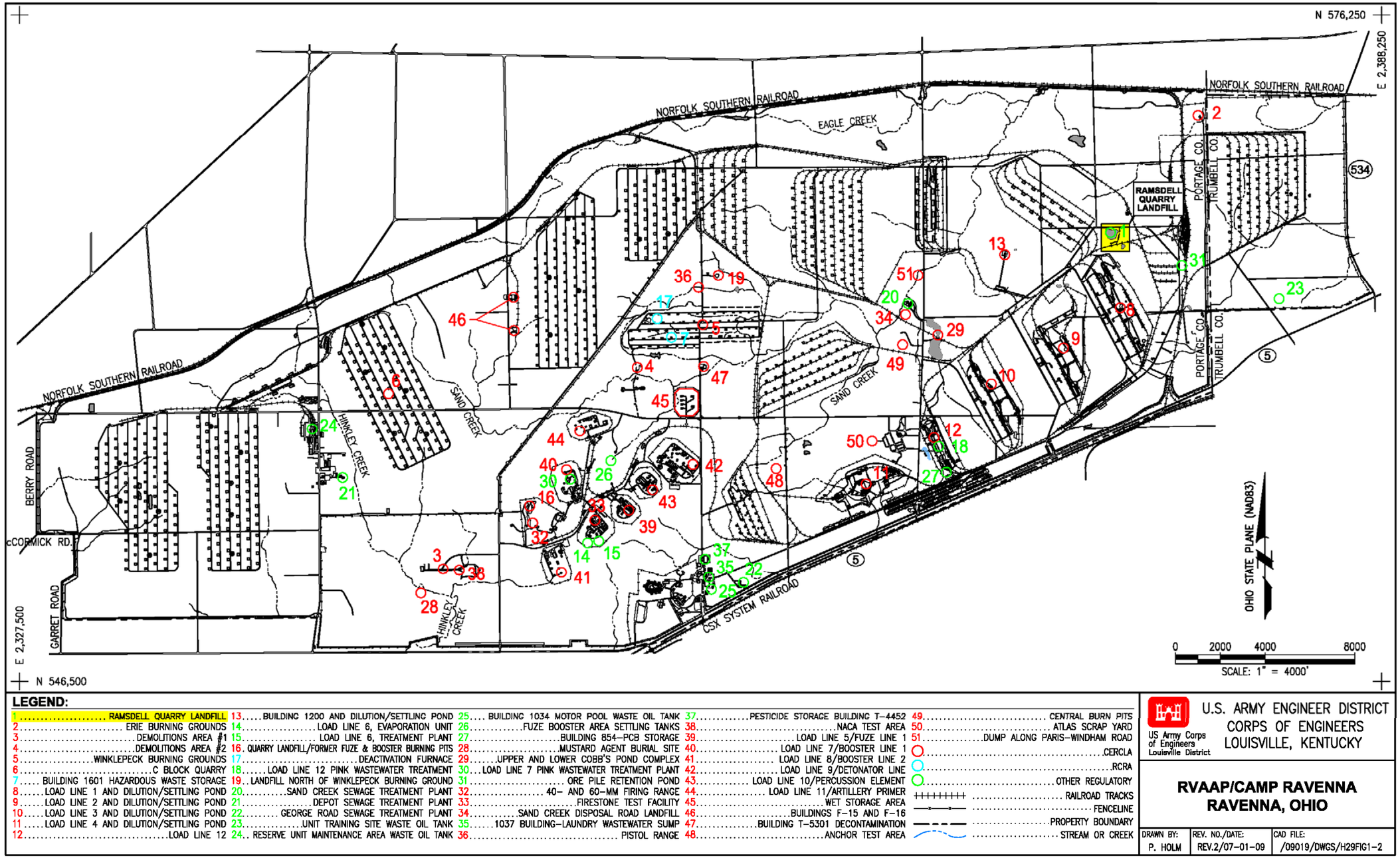

LEGEND:

1 ..... RAMSDELL QUARRY LANDFILL
2 ..... ERIE BURNING GROUNDS
3 ..... DEMOLITIONS AREA #1
4 ..... DEMOLITIONS AREA #2
5 ..... WINKLEPECK BURNING GROUNDS
6 ..... C BLOCK QUARRY
7 ..... BUILDING 1601 HAZARDOUS WASTE STORAGE
8 ..... LOAD LINE 1 AND DILUTION/SETTLING POND
9 ..... LOAD LINE 2 AND DILUTION/SETTLING POND
10 ..... LOAD LINE 3 AND DILUTION/SETTLING POND
11 ..... LOAD LINE 4 AND DILUTION/SETTLING POND
12 ..... LOAD LINE 12
13 ..... BUILDING 1200 AND DILUTION/SETTLING POND
14 ..... LOAD LINE 6, EVAPORATION UNIT
15 ..... LOAD LINE 6, TREATMENT PLANT
16 ..... QUARRY LANDFILL/FORMER FUZE & BOOSTER BURNING PITS
17 ..... DEACTIVATION FURNACE
18 ..... LOAD LINE 12 PINK WASTEWATER TREATMENT
19 ..... LANDFILL NORTH OF WINKLEPECK BURNING GROUND
20 ..... SAND CREEK SEWAGE TREATMENT PLANT
21 ..... DEPOT SEWAGE TREATMENT PLANT
22 ..... GEORGE ROAD SEWAGE TREATMENT PLANT
23 ..... UNIT TRAINING SITE WASTE OIL TANK
24 ..... RESERVE UNIT MAINTENANCE AREA WASTE OIL TANK
25 ..... BUILDING 1034 MOTOR POOL WASTE OIL TANK
26 ..... FUZE BOOSTER AREA SETTLING TANKS
27 ..... BUILDING 854–PCB STORAGE
28 ..... MUSTARD AGENT BURIAL SITE
29 ..... UPPER AND LOWER COBB'S POND COMPLEX
30 ..... LOAD LINE 7 PINK WASTEWATER TREATMENT PLANT
31 ..... ORE PILE RETENTION POND
32 ..... 40– AND 60–MM FIRING RANGE
33 ..... FIRESTONE TEST FACILITY
34 ..... SAND CREEK DISPOSAL ROAD LANDFILL
35 ..... 1037 BUILDING–LAUNDRY WASTEWATER SUMP
36 ..... PISTOL RANGE
37 ..... PESTICIDE STORACE BUILDING T–4452
38 ..... NACA TEST AREA
39 ..... LOAD LINE 5/FUZE LINE 1
40 ..... LOAD LINE 7/BOOSTER LINE 1
41 ..... LOAD LINE 8/BOOSTER LINE 2
42 ..... LOAD LINE 9/DETONATOR LINE
43 ..... LOAD LINE 10/PERCUSSION ELEMENT
44 ..... LOAD LINE 11/ARTILLERY PRIMER
45 ..... WET STORAGE AREA
46 ..... BUILDINGS F–15 AND F–16
47 ..... BUILDING T–5301 DECONTAMINATION
48 ..... ANCHOR TEST AREA
49 ..... CENTRAL BURN PITS
50 ..... ATLAS SCRAP YARD
51 ..... DUMP ALONG PARIS–WINDHAM ROAD
CERCLA
RCRA
OTHER REGULATORY
RAILROAD TRACKS
FENCELINE
PROPERTY BOUNDARY
STREAM OR CREEK

US Army Corps of Engineers Louisville District

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE, KENTUCKY

RVAAP/CAMP RAVENNA
RAVENNA, OHIO

DRAWN BY:	REV. NO./DATE:	CAD FILE:
P. HOLM	REV.2/07–01–09	/09019/DWGS/H29FIG1–2

Figure 1-2. RVAAP/Camp Ravenna Site Location Map

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2.0 DESCRIPTION OF REMEDIAL ACTIVITIES

This section provides general site information related to storm water pollution prevention in accordance with permit requirements.

2.1 SEQUENCE OF MAJOR ACTIVITIES

Proper sequencing or phasing of major activities provides various site controls including limiting the amount of disturbed area at one time. For the purposes of this plan, site activities and general phasing are summarized as follows:

Phase I

1. Perform pre-mobilization activates:
    a. Delineate boundaries of the removal areas, equipment movement area and multi-increment (MI) sample subareas within the former quarry, as depicted in Attachment C, Drawings C-4 and C-5;
    b. Perform soil sampling of MI areas RQL-041M through RQL-048M; and
    c. Treat removal areas and equipment movement areas (within the former quarry) with wetland invasive weed control (herbicide).
2. Notification and clearance of utilities.
3. Clearance of MEC.
4. Clearing and grubbing of the construction support and excavation areas.
5. Preparation of site construction support area and installation of necessary storm water controls and BMPs (specified in Attachment C, Drawings C-4, C-7, and C-8):
    a. Install stockpile and excavation soil staging areas;
    b. Install rock construction entrances, truck loading, portable water tank and equipment storage areas;
    c. Pump, filter and land apply water within the excavation areas (if needed);
    d. Install sandbag diversion berms to eliminate/minimize storm water run-on into excavation areas;
    e. Install silt fence; and
    f. Install storm water collection system (portable storage tank, hoses, and pump).
6. Maintain Sediment and Erosion Controls.

Phase II

After sediment controls are installed and construction support areas are prepared, excavation can commence. The objective of phasing is to minimize disturbed areas and therefore minimize potential issues regarding excavation water or sediment laden run-off due to storm events. Phase II shall involve the following:

1. Removal of contaminated soil in excavation areas.

2. Confirmation of contaminated soil removal.
3. Survey limits of excavation.
4. Backfill, grade, seed and straw excavation areas.
5. Remove sandbag diversion berms and associated storm water collection systems.

Phase III

Site restoration activities will commence when excavation is complete and will include the following:

1. Grade, seed and straw excavation support areas.
2. Install additional silt fence.
3. Remove, grade, seed and straw stock pile and excavated soil staging areas.
4. Weekly inspections of storm water controls and newly seeded wetland areas.
5. Maintain silt fence until 70% vegetation is established.
6. Remove and dispose of storm water controls.

Actual phasing shall be determined with the aid of the Subcontractor Construction Supervisor, SAIC Construction Manager, and USACE Contract Officer Representative (COR). Phasing is also determined by the Subcontractor's schedule and weather conditions. Additional erosion and sediment controls may be required as the project progresses. Subcontractor will be fully responsible for the installation and maintenance of all required BMPs throughout the project.

2.2 ESTIMATED TOTAL DISTURBED AREA

The total construction area (limits of work) within RQL to be disturbed is 2.5 acres. Approximately 1.7 acres will undergo excavation, transport, and disposal. The remaining construction area will be used for equipment movement (rock construction entrance and truck loading area), equipment staging (e.g., roll-off containers, portable water storage tanks), and areas needed for constructability and execution. These features are portrayed and detailed in Attachment C, Drawings C-4 and C-8 of the RD.

2.3 RUN-OFF COEFFICIENT

Prominent features at RQL include the former quarry, the closed sanitary landfill, several drainage ditches, access roads, and a former rail line. The land surface in a large portion of the AOC slopes into the former quarry, which occupies most of the AOC. Surface water runoff collects in a wetland area in the bottom of the quarry. The area is vegetated and not maintained on a regular basis. The project area will be restored to the original conditions. The excavation areas will be backfilled to maintain drainage and restored in accordance with Section 9 of the RD. A temporary excavated soil staging area, two rock construction entrances, and a stone surface area (equipment storage, equipment movement area, etc.) will be installed and used during remedial activities. The rock construction entrance and stone surface area will not be removed during restoration activities. No new impervious areas will be left onsite following remedial activities. The areas are classified as open space for pre-

construction and post-construction and will be given a runoff coefficient of 0.2 for both scenarios in accordance with Table 1 in Part III.G.2.e of the Ohio EPA Construction General Permit No. OHC000003.

2.4 SITE SOIL

Surface soil within the quarry at RQL is thin (approximately seven inches below ground surface [BGS]) and bedrock is exposed in some areas within the quarry.

2.5 RECEIVING STREAM

Construction activities will only impact parts of the wetland areas within the quarry bottom. The wetland area is seasonally flooded and isolated (no surface water drainage to another body of water). Prior to soil remediation (construction activities), the water from the bottom of the quarry will be pumped to wooded areas outside of the landfill, as necessary. During construction activities:

1. Water that is connected to excavated (contaminated) areas will be considered "Excavation Water," and will be managed in accordance with Table 10-1 of the RD.

2. Any water that accumulates during construction activities but is not connected to excavated (contaminated) areas may also be pumped to the wooded areas outside of the landfill.

For water that is pumped to the wooded areas, a sediment bag will be used to minimize sedimentation build up at the receiving areas. The pumping will be conducted so that no significant ponding or flooding occurs in the receiving areas.

Clearing of riparian areas, vegetation, and trees shall be minimized during remedial activities. Sediment and erosion controls shall be installed prior to earth disturbing activities to minimize impacts to wetlands areas not requiring soil removal. Construction site storm water associated with disturbed areas shall be collected in a temporary storage tank for characterization and proper disposal.

2.6 COPY OF PERMIT

A copy of the permit to authorize storm water discharges associated with construction activities will be included in Appendix A of this plan when it is obtained.

2.7 SITE MAP

SWP3 drawings (Attachment C, Drawings C-3, C-4, C-5, C-7, and C-8) have been prepared in accordance with permit requirements. These drawings address the following:

1. Limits of earth disturbing activities;
2. Existing topography;

3. Surface water locations;
4. Location of constructed facilities;
5. Location of BMPs; and
6. Storage areas and construction entrances.

3.0 STORM WATER CONTROLS

This section describes the project site storm water controls to be implemented to minimize storm water pollution from the construction activities. This section discusses the following control practices and methods:

- Non-Structural
  - Preservation methods
  - Existing access roads

- Erosion Control Practices
  - Project phasing
  - Stabilization/seeding (temporary/permanent)

- Run-on and Run-off Control Practices
  - Excavation water storage tank
  - Diversion berms (sandbags, cofferdams)

- Sediment Control Practices
  - Silt fence
  - Rock construction entrance/exit
  - Improved haul truck routes

3.1 NON-STRUCTURAL PRESERVATION METHODS

The Subcontractor shall preserve the existing vegetation as much as feasible outside the limits of work. In addition, the Subcontractor shall perform the construction activities with an approach so as to limit the amount of land disturbed at one time. Site work shall only be conducted within the project limits.

3.2 EROSION CONTROL PRACTICES

Erosion control practices minimize the transport of soil particles by concentrated flows of water or wind. The following erosion control practices shall be employed as part of the construction activities at RQL:

- Project phasing; and
- Stabilization/seeding.

The Subcontractor shall install all erosion control BMPs at the site, as required.

As detailed in Section 2, project phasing is an important tool to minimize disturbed areas and in turn minimize erosion. Stabilization of the excavated areas is regulated under the SWP3 requirements.

3.2.1 Temporary Seeding

Temporary seeding shall not be required due to the project schedule. Disturbed areas will be active through project duration. Only permanent seeding requirements shall apply.

3.2.2 Permanent Seeding

All disturbed areas must be seeded within seven days following excavation, backfilling, and final grading activities. The wetland areas within the former quarry (shown in Attachment C, Drawing C-3) shall be seeded with the Emergent Marsh seed mixture presented in Table 3-1. Additionally, these areas will be seeded with an annual rye grass at a broadcast application rate of no less than 10 pounds per acre. The vigorous seedlings of the rye grass will provide rapid ground cover within the wetland area and prevent invasive species from overtaking the newly seeded wetland.

Table 3-1. "Emergent Marsh" Seed Mixture for RVAAP/Camp Ravenna

Seed Type	Mixture %
Shallow/Lurid Sedge (*Carex lurida)*	10.0%
Blunt broom sedge (*Carex scoparia)*	10.0%
Fox sedge (*Carex vulpinoidea)*	20.0%
Boneset (*Eupatorium perfoliatum)*	2.0%
Soft rush (*Juncus effuses)*	10.0%
Rice cutgrass (*Leersia oryzoides)*	4.0%
Great/Soft-stemmed Bulrush (*Schoenoplectus tabernaemontani)*	5.0%
Dark green bulrush (*Scirpus atrovirens)*	15.0%
Woolgrass (*Scirpus cyperinus)*	7.0%
Giant Bur Reed (*Sparganium eurycarpum)*	15.0%
Swamp milkweed (*Asclepias incarnate)*	0.5%
Blue Vervain (*Verbena hastate)*	1.0%
Nodding bur marigold (*Bidens cernua)*	0.5%
Specifications: Broadcast at 15 lbs/acre. Mulch with a minimum of 3 bales of straw per 1,000 square feet.	

The Subcontractor will use Camp Ravenna-approved grass seed mixture for permanent cover for construction areas disturbed during field activities. Table 3-2 presents the seed mixture and application specifications (OHARNG 2005). Fertilizer and lime are not needed for seeding with native seed mixes.

Table 3-2. "Open Area" Seed Mixture for RVAAP/Camp Ravenna

Seed Type	Mixture %
Nodding Wild Rye (*Elymus Canadensis*)	23.5%
Virginia wild rye (*Elymus virginicus*)	25%
Little Bluestem (*Schizachyrium scoparium*)	22%
Partridge Pea (*Chamaecrista fasciculate*)	18.75%
Thin-leaved Coneflower (*Rudbeckia triloba*)	7.75%
Brown fox sedge (*Carex vulpinoidea*)	1.5%
Black-eyed Susan (*Rudbeckia hirta*)	1.5%
Specifications: Broadcast at 18 lbs/acre, drilled at 12 lbs/acre Mulch with a minimum of 3 bales of straw per 1000 square ft	

Other effective materials may be used, to include specialized seeding products/technologies such as seed impregnated fiber matting. Any product or technology used for seeding RQL will meet the seeding requirements presented in Tables 3-1 and 3-2 and applicable Ohio EPA storm water pollution prevention controls. It should be noted that seed application rates are specified by OHARNG and do not adhere to those specified in the Ohio EPA SWPPP Construction Site Inspection Checklist.

3.2.3 Mulching

Straw mulch shall be applied at a rate necessary to uniformly cover all disturbed areas; a rate of three bales per 1,000 square feet (ft^2) is considered sufficient. Hydro-mulching is an effective mulching technique and may be utilized. However, hydro-mulching is less durable and re-application of the product may be required. The purpose of mulching is to provide an environment for seed germination. If inspections reveal germination has not occurred within 14 days of application, re-seeding and re-mulching will be required.

3.2.4 Irrigation

Irrigation shall be applied as required to ensure a healthy vegetative cover; any bare areas shall be re-seeded and re-mulched. Potable water for irrigation shall be obtained by the Subcontractor from an approved off-site source. Final re-vegetation is achieved once a 70% cover is obtained in all disturbed construction areas, in accordance with *Rainwater and Land Development* (ODNR 2006) guidance, as determined by the SAIC Construction Manager and USACE COR. Once it is confirmed that at least 70% cover has been achieved, the Subcontractor is responsible for removing and disposing of erosion controls.

3.3 RUN-ON/RUN-OFF CONTROL PRACTICES

3.3.1 Diversion Berms

Temporary diversion berms (e.g., earthen material, sandbags, temporary cofferdams, or equivalent watertight barrier) shall be used to control run-on and run-off. Diversions shall be installed and/or

removed as necessary to ensure all potential run-on and run-off is controlled. The Subcontractor shall minimize storm water run-on and run-off from excavation areas and prevent contact of storm water and/or rainfall with waste material by maintaining diversion berms around the excavation areas during rainfall events. Other similar structural controls may be utilized.

3.3.2 Excavation Water

Any water accumulation within an open excavation area that comes into contact with contaminated soil shall be classified as "Excavation Water" (contact water). The Subcontractor shall notify the SAIC Construction Manager of the presence of water in the excavation and stockpile area. Excavation water shall be pumped to a portable water storage tank provided by the Subcontractor. The portable water tank shall be equipped with secondary containment (e.g., double walled, berm). The Subcontractor will be responsible for characterizing, labeling, transportation, and final disposal of the collected water within the portable storage tank in accordance with Section 10.2 of the RD. The Subcontractor shall arrange for the disposition of the liquid at a suitable waste disposal facility with prior approval from USACE/SAIC. The RVAAP Facility Manager will sign all waste profiles and waste manifests for the disposal of project investigation-derived waste (IDW) to the approved disposal facility.

3.3.3 Soil Stockpiles

It is anticipated excavated soil will be stockpiled in a staging area. The staging area shall be constructed by removing topsoil and stockpiling to the side. The staging area shall be bounded by an earthen berm to collect any contact water. Contact water will be handled per Section 10.2 of the RD. Soil shall be covered with 10 mil thick plastic and weighed down with sandbags to prevent sediment migration in the event of rain or high winds. The staging area will be scraped at the completion of excavation activities. A MI sample will be collected from the staging area by SAIC and analyzed for the Constituents of Concern (COCs). Additional soil removal and MI sampling may be necessary until the cleanup goals are achieved.

Backfill may be stockpiled in the construction support area prior to backfilling the excavation areas and bounded by silt fence to prevent sediment migration.

3.3.4 Diversion Berm

Prior to excavation, water within the former quarry shall be pumped through a sediment filter and land applied. A diversion berm shall be constructed within the quarry to divert any water from the excavation areas. The berm shall consist of sandbags, earthen material, or temporary cofferdams, as depicted on Attachment C, Drawings C-4 and C-8. The diversion berm will direct storm water run-off away from open excavation areas. Other diversions shall be constructed as necessary to prevent storm water run-on and run-off. All necessary diversions are not depicted on site plans as locations and quantity will change during site operations and existing site conditions during excavation

activities. Excavation water present during excavation activities will be managed per Section 10.2 of the RD.

3.4 SEDIMENTATION CONTROL PRACTICES

Sediment control practices are employed to attempt to remove particles from run-off. The following sediment controls shall be implemented:

- Silt fence;
- Rock construction entrance; and
- Improved haul truck routes.

The Subcontractor shall install all sediment control BMPs at the site prior to beginning ground disturbance, maintain all controls for the duration of the project, and provide additional controls as required.

3.4.1 Silt Fence

Water resources shall be protected by the proper installation of silt fence. Silt fence shall be placed in areas of sheet flow run-off on nearly level contours. Silt fence is not intended to treat concentrated flows and shall not be placed across storm water conveyances. Silt fence shall be installed downgradient of disturbed areas as depicted and detailed on Attachment C, Drawings C-4, C-7 and C-8.

Approximately 890 linear ft of silt fence will be used during remedial activities.

The silt fence shall be removed and disposed of by the Subcontractor once 70% vegetation is established and upon approval by the SAIC Construction Manager and USACE COR.

3.4.2 Rock Construction Entrance/Exit

Rock construction entrances/exits will be installed in accordance with specifications on Attachment C, Drawings C-4 and C-8. The Subcontractor shall install construction entrances consisting of a minimum of 6 inches of Number 2 (No. 2) aggregate stone placed on a non-woven geotextile fabric. The No. 2 stone shall meet the gradation specification established in the American Association of State Highway and Transportation Officials (AASHTO) M 43 or American Society for Testing Materials (ASTM) D 448. The locations of the construction entrances/exit are shown in the Construction Site Plan (Attachment C, Drawing C-4) and detailed (Attachment C, Drawing C-8). No work shall be performed during periods of inclement weather as determined by the SAIC Construction Manager. Once the rock construction entrance becomes mud packed, it shall be reconstructed and new stone will be placed per project details. The rock construction entrances will remain in place at the completion of remedial activities.

3.4.3 Haul Truck Routes

RQL will be accessed from an improved road, Ramsdell Road (Attachment C, Drawing C-6). The Subcontractor will install a stone surface area for the truck loading and movement in accordance with specifications on Attachment C, Drawings C-4 and C-8. The stone area will consist of one layer of geotextile fabric and two six inch coarses of aggregate stone (No. 2). The Subcontractor will maintain this area throughout the project and ensure it is free of mud. If the area becomes muddy, additional crushed stone will be placed at the ingress/egress. The stone surface area will remain in place at the completion of remedial activities (Attachment C, Drawing C-7). The subcontractor will fill, grade, and seed the footprint of the off-road truck route at the completion of remedial activities.

3.5 IMPLEMENTATION SCHEDULE

The implementation of this RD will be contingent on Ohio EPA's approval of:

1. The Level 2 Isolated Wetland Permit Application; and
2. The Final RD.

Table 3-3 presents an estimated timeline for implementation of the RD by the following major components of work:

- Permit/notification requirements;
- Site preparation/set-up;
- Excavation and removal;
- Confirmation sampling;
- Site restoration;
- Demobilization; and
- Preparation of the Construction Report.

Generally, construction activities shall occur during daylight hours (i.e., 7:00 a.m. to 5:00 p.m.) on a 5-day per week schedule. Preparation of the Construction Report shall follow conclusion of site restoration activities.

Table 3-3. Project Schedule

Item	Task Name	Date
1	Final Remedial Design Approved	Pending Ohio EPA, OHARNG, and USACE Approval
2	Mobilization to site	14 days after subcontractor notice to proceed
3	Site Preparation	5 days after item 2
4	Excavation and Removal	10 days after item 3
5	Confirmation Sampling and Analysis	10 days after item 4
6	Ohio EPA Review of Confirmation Samples	4 days after item 5
7	Site Restoration	4 days after item 6
8	Demobilization	1 day after item 7
9	Post Construction Storm Water Monitoring	7 days after item 7
10	Removal of Storm Water Controls	To be determined

Ohio EPA = Ohio Environmental Protection Agency
OHARNG = Ohio Army National Guard
USACE = United States Army Corps of Engineers

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4.0 MAINTENANCE AND INSPECTIONS

This section describes the preventive maintenance and inspections that shall be performed to ensure the storm water controls are properly maintained and to determine if repairs are needed.

4.1 PREVENTIVE MAINTENANCE

Preventive maintenance shall be performed on equipment to ensure proper operation and to detect potential leaks before they occur. Good housekeeping practices shall be maintained at all times during construction activities. All employees shall practice due diligence to prevent any damage to the storm water control measures. Containers shall be provided at all necessary locations for the collection of trash and general construction debris. Fueling activities shall be conducted at the staging area away from storm water conveyances. If a mobile fuel truck is used to re-fuel construction equipment, the truck shall be staged within a secondary containment area with on-hand spill response supplies. The secondary containment area will be inspected daily.

4.2 FUGITIVE DUST

Construction vehicle speed is a significant component of dust generation. Vehicle speeds shall not exceed the posted speed limit. As an added control, dust suppressants shall be used to minimize dust generation along the service road. Water may be sprayed lightly as not to produce run-off. Surface gravel, when recommended, will reduce the source of dust emission by limiting the amount of fine particles available for release. Excavation activities may also require dust suppressants. A water mist shall be used in minimal quantities as not to produce run-off.

4.3 DEWATERING

It is anticipated that dewatering activities may be necessary within the excavation areas at RQL. Existing water within the limits of excavation will be pumped through a sediment bag and land applied. All excavation and contact water encountered shall be pumped into a portable water storage tank. Dewatering activities shall not produce discharges of impacted or sediment laden water to the ground surface.

4.4 COVERS OR TARPS

Impermeable covers or tarps shall be provided by the Subcontractor at the construction site. The covers shall be utilized as an additional aid to prevent storm water from contacting the contaminated soil. Tarps will be placed over all exposed contaminated soil, and secured with sand bags at the end of each day and during inclement weather. Sand bags placed at the perimeter shall also serve as storm water diversions to minimize run-on. The tarps shall be sized appropriately to minimize overlap within the excavated area. Any overlaps in the tarps shall be secured together to form a watertight seal.

Run-off measures shall be evaluated and shall be installed to convey clean run-off from covers away from bare soil and disturbed areas. All torn sheets shall be replaced. When covers are no longer required they shall be completely removed and disposed of by the Subcontractor.

4.5 STREET SWEEPING

All public roadways shall remain sediment free. Transport of soil off-site is to be controlled. Primarily, this shall be accomplished by cleaning truck tires before leaving the site and maintaining the rock construction entrances/exit. Additionally, street sweeping may be required. Sweeping includes the collection and proper disposal of transported soil. Soil shall not be dispersed along roadways via brooming techniques. In the event brooming techniques are used, all sediment shall be removed from the roadway by manual techniques.

4.6 SPILL PREVENTION

Spills are a source of storm water contamination. All products shall be kept in original containers unless they are not resealable. Original labels and material safety data sheets shall be retained for all hazardous materials to be used for the project.

All on-site vehicles shall be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum, oil, and lubricant products shall be sorted in tightly sealed containers and clearly labeled. These containers shall be stored in secondary containment and be inspected daily.

Spill cleanup procedures outlined in Section 12.1.2 of the Facility-Wide Safety and Health Plan (FWSHP) (USACE 2001), pages 10 through 15 of the Installation Spill Contingency Plan (ISCP) (PIKA 2009), and the OHARNG Spill Contingency Plan (if the spill is on OHARNG property) shall be understood by employees, contractors, and the Subcontractor.

Materials will be maintained in the established storage areas away from direct traffic routes to prevent accidental spills. A spill response kit containing equipment compatible to the materials stored will be maintained in the established storage area.

In the event of a material spill, upon discovery, on-site personnel will immediately:

1. Stop the material from continuing to release if possible.

2. Contain the material (e.g., diking or ditching, covering storm drains and catchment basins).

3. Cleanup the material with chemicals, appropriate materials, and equipment. Items used may include brooms, shovels, rags, absorbent materials (e.g., sand, sawdust), and plastic or metal containers specifically designed for this purpose.

4. Notify the security dispatcher (Guard Post 1) and the SAIC Construction Manager as soon as possible.

5. Complete necessary paperwork as required by the RVAAP ISCP (PIKA 2009) and OHARNG Camp Ravenna Spill Plan.

6. Report the spill to the Ohio EPA Spill Hotline (1-800-282-9378) if the spill is over a "reportable quantity" (listed on Table 1 of Appendix A to 49 Code of Federal Regulation 172.101) and not on OHARNG property.

During spill response activities, on-site personnel will wear appropriate protective clothing (e.g., goggles, gloves) to prevent contact with spilled materials. If hazardous conditions exist, response activities will cease and personnel will move a safe distance from the area and await outside emergency support.

4.7 NON-SEDIMENT POLLUTION CONTROL

The Subcontractor shall provided containers for the collection of trash and general construction debris. No waste materials shall be buried on-site. Fueling activities shall be conducted at the staging area away from storm water conveyances. If a mobile fuel truck is used to re-fuel construction equipment, the truck shall be staged within secondary containment with on-hand spill response supplies. The secondary containment area will be inspected daily.

Good housekeeping practices include:

- Neat and orderly storage;
- Prompt clean up of spills; and
- Minimizing off-site tracking.

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5.0 INSPECTION OF CONTROLS AND PLAN REVISIONS

5.1 INSPECTION OF CONTROLS

Prior to construction activities, the Subcontractor will inspect all storm water controls (including the excavation water collection system) and document proper placement in accordance with the Construction Quality Assurance Plan (CQAP) in Section 11 of the RD. Daily inspections of all storm water controls shall be performed by the Subcontractor Construction Supervisor and documented on a *Storm Water Pollution Prevention Site Inspection Report*. The Subcontractor also shall inspect the storm water controls within 24 hours after any storm event greater than 0.5 inches of rain per 24 hour period (OHC000003 Part III.G.2.i). The inspection requirements include but not limited to the following items (as applicable):

- Construction entrances;
    - Locations where vehicles enter or exit the site shall be inspected for evidence of off-site sediment tracking.
- Non-sediment pollution control;
    - Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants.
- Silt fence applications;
- Diversion berms;
- Any secondary containment; and
- Permanent soil stabilization.

Erosion and sediment control measures identified in the plan shall be observed to ensure they are functioning properly on a daily basis.

Qualified inspection personnel are those with documented knowledge and experience in the installation and maintenance of erosion and sediment controls as determined by the SAIC Construction Manager.

5.2 PLAN REVISIONS

Based on the results of the inspection, the SWP3 shall be revised as appropriate, but no later than seven calendar days following the inspection. Revisions shall incorporate placement of new BMPs if necessary and any newly disturbed areas.

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6.0 POST CONSTRUCTION

6.1 POST CONSTRUCTION STORM WATER MANAGEMENT

After final grading, the site shall be re-vegetated. Re-vegetation shall be conducted in accordance with Section 9.0 of the RD.

The site shall be inspected by the Subcontractor weekly after restoration efforts have ceased. Storm water controls will also be inspected within 24 hours of a storm event (0.5 inches or greater) and every 24 hours during extended rain events. These inspections ensure erosion controls are effective. If vegetation has not taken root after one month, the areas shall be re-seeded. A total of at least 70% vegetative cover is required prior to removal of erosion controls by the Subcontractor, as determined by the SAIC Construction Manager and USACE COR.

6.2 POST CONSTRUCTION BMPS

Post-construction BMPs are not required for this project. Permanent alteration (adversely impacting) of the watershed and permanent installation of impervious surfaces are not proposed. The project site shall be returned to a natural condition and the watershed shall be improved.

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7.0 NOTICE OF TERMINATION

A Notice of Termination (NOT) shall be submitted following final stabilization for disturbed areas. Final stabilization includes a vegetative cover with a density of at least 70% and approval from SAIC Construction Manager and USACE COR or designee. All temporary sediment control practices are to be removed upon final stabilization.

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8.0 CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for known violations.

Signed: _____ Date: _____

Signed: _____ Date: _____

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9.0 CONTRACTOR'S CERTIFICATION

I certify under penalty of law that I understand the conditions of the general permit OHC000003 that authorizes storm water discharges associated with construction activities and details presented in this plan identified as part of this certification.

Signed: _____ Date: _____

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10.0 REFERENCES

ODNR (Ohio Department of Natural Resources) 2006. *Rainwater and Land Development, Ohio's Standards for Stormwater Management, Land Development, and Urban Stream Protection.* 2006.

OHARNG (Ohio Army National Guard) 2005. *Ohio Army National Guard Approved Grass Seed Mixes for Temporary Cover and Site Closures.* June 2005.

Ohio EPA (Ohio Environmental Protection Agency) 2004. Director's Final Findings and Orders in the matter of U. S. Department of the Army, Ravenna Army Ammunitions Plant. June 2004.

PIKA 2009. Installation Spill Contingency Plan (ISCP) for the Ravenna Army Ammunition Plant, Ravenna, Ohio. January 2009.

USACE (U.S. Army Corp of Engineers) 2001. *Facility-Wide Safety and Heath Plan for Environmental Investigations at the Ravenna Army Ammunition Plant, Ravenna, Ohio.* March 2001.

USACE 2009. *Final Record of Decision for RVAAP-01 Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio.* March 2009.

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APPENDIX A

PERMIT TO AUTHORIZE STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES

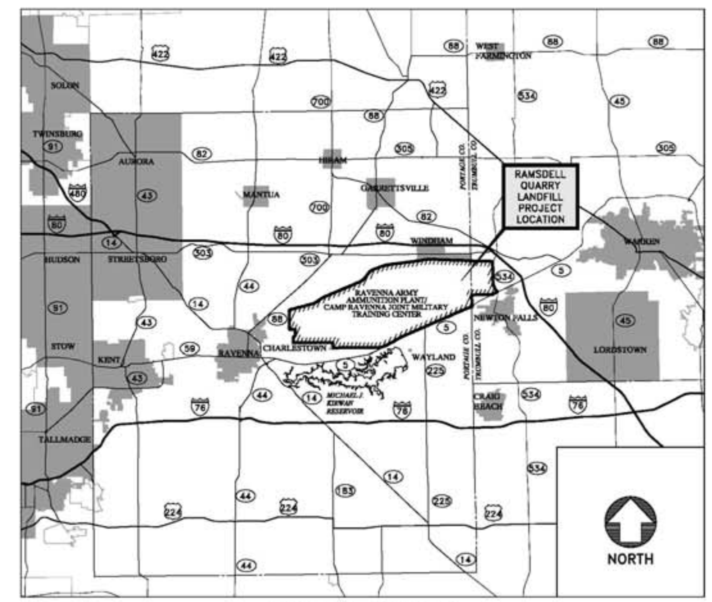
(TO BE INCLUDED WHEN OBTAINED)

Attachment C. Design Drawings:

C-1 – Title Sheet
C-2 – General Notes
C-3 – Existing Site Conditions
C-4 – Construction Site Plan
C-5 – Soil Removal and Sampling Plan
C-6 – Traffic Management Plan
C-7 – Site Restoration Plan
C-8 – Construction Details

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
RAVENNA ARMY AMMUNITION PLANT - RAMSDELL QUARRY LANDFILL REMEDIAL DESIGN

LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

THIS REMEDIAL DESIGN ADDRESSES THE EXCAVATION AND OFF-SITE DISPOSAL OF APPROXIMATELY 1,608 CUBIC YARDS OF CONTAMINATED SOIL (IN SITU) FROM THE BOTTOM OF THE QUARRY AT THE RAMSDELL QUARRY LANDFILL AREA OF CONCERN ON THE RAVENNA ARMY AMMUNITION PLANT/ CAMP RAVENNA JOINT MILITARY TRAINING CENTER IN RAVENNA, OHIO.

SCOPE OF WORK

US Army Corps of Engineers®
Louisville District

U.S. Army Engineer District
Corps of Engineers
Louisville, Kentucky

SAIC®
From Science to Solutions

Science Applications International Corp.
Engineering of Ohio, Inc.
Twinsburg, Ohio

CLIENT: US Army Corps of Engineers
Ravenna Army Ammunition Plant
Ravenna, Ohio

PROJECT: RAMSDELL QUARRY LANDFILL REMEDIAL DESIGN

DRAWING TITLE: TITLE SHEET

DATE: 06/18/19

C-1
DRAWING NUMBER

GENERAL NOTES

1. HEREINAFTER, THE TERM "SUBCONTRACTOR" IN THESE DESIGN DRAWINGS SHALL REFER TO THE ENTITIES (I.E., THE SUBCONTRACTOR AND/OR ITS SUBCONTRACTOR[S]) IMPLEMENTING THE RQL REMEDIAL DESIGN (RD) UNLESS OTHERWISE NOTED.
2. THE SUBCONTRACTOR SHALL COMPLETE ALL ACTIVITIES ASSOCIATED WITH THE PROJECT IN COMPLIANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS AND REQUIREMENTS.
3. THE SUBCONTRACTOR SHALL EXECUTE ALL REMEDIAL ACTIVITIES IN ACCORDANCE WITH THE RQL RD, DRAWINGS, SPECIFICATIONS, AND ATTACHMENTS.
4. THE SUBCONTRACTOR SHALL SUPPLY ALL EQUIPMENT, MATERIALS, AND LABOR TO PERFORM THE CONTRACT REQUIREMENTS INCLUDING ALL WORKER SAFETY EQUIPMENT.
5. THE SUBCONTRACTOR SHALL COMPLY WITH SITE ACCESS PROTOCOLS.
6. ACCESS TO RAVENNA ARMY AMMUNITION PLANT (RVAAP) SHALL BE THROUGH THE MAIN GATE POST 1 LOCATED OFF STATE ROUTE 5. THIS GATE IS GUARDED AND SHALL REQUIRE ADDITIONAL TIME TO GAIN ACCESS. THE SUBCONTRACTOR SHALL BE REQUIRED TO ALLOW FOR DELAYS WITHOUT ADDITIONAL CHARGES TO RVAAP/SAIC.
7. TOPOGRAPHIC MAPPING DATA IS BASED ON SURVEY AND AERIAL PHOTOGRAPH INFORMATION. MINOR DISCREPANCIES BETWEEN DRAWINGS AND ACTUAL FIELD CONDITIONS SHALL NOT BE CAUSE FOR ADDITIONAL PAYMENT. IT IS THE SUBCONTRACTOR'S RESPONSIBILITY TO VERIFY EXISTING CONDITIONS, ELEVATIONS, AND DIMENSIONS PRIOR TO THE START OF CONSTRUCTION AND NOTIFY SAIC OF CONFLICTS.
8. THE SUBCONTRACTOR SHALL INSTALL CONSTRUCTION SIGNS AT THE LOCATIONS INDICATED ON DRAWING C-6 PRIOR TO INITIATION OF SITE PREPARATION ACTIVITIES.
9. THE SUBCONTRACTOR SHALL CONTACT THE RVAAP FACILITY MANAGER AT LEAST 28 CALENDAR DAYS PRIOR TO CONSTRUCTION ACTIVITIES TO COORDINATE UTILITY SURVEY AND CLEARANCES. THE IDENTIFICATION AND LOCATION OF UTILITIES ON THESE DRAWINGS IS BASED ON BEST AVAILABLE INFORMATION AT TIME OF PREPARATION AND MAY NOT BE REPRESENTATIVE OF ACTUAL SITE CONDITIONS.
10. STORMWATER CONTROLS SHALL BE INSTALLED PRIOR TO INITIATION OF ANY CONSTRUCTION ACTIVITY THAT MAY CAUSE EROSION OR SEDIMENTATION. STORMWATER CONTROL MEASURES SHALL BE MAINTAINED AND REINSTALLED AS NECESSARY FOR THE DURATION OF CONSTRUCTION AND RESTORATION ACTIVITIES.
11. AT A MINIMUM THE SUBCONTRACTOR SHALL PLACE EROSION CONTROLS WHERE INDICATED ON THE DRAWINGS. ADDITIONAL CONTROLS MAY BE REQUIRED, DEPENDING ON SITE CONDITIONS. EROSION CONTROL MEASURES SHALL MEET ALL FEDERAL AND STATE REQUIREMENTS.
12. THE SUBCONTRACTOR MAY OBTAIN POTABLE WATER FOR CONSTRUCTION PURPOSES FROM EXISTING RVAAP FACILITIES. ANY HOSE CONNECTED TO A FIXED POTABLE WATER SUPPLY MUST BE EQUIPPED WITH BACKFLOW PREVENTION ON THE SUPPLY CONNECTION BEFORE CONNECTING THE HOSE. COORDINATION WITH THE RVAAP/SAIC SHALL BE INITIATED DURING MOBILIZATION IN ORDER TO PROVIDE SUFFICIENT TIME TO OBTAIN ACCESS TO THE IDENTIFIED POTABLE WATER SUPPLY. POTABLE WATER SUPPLIES SHALL NOT BE ACCESSED WITHOUT CONSENT FROM RVAAP/SAIC.
13. IF UNEXPECTED MATERIALS, SUCH AS MEC OR ARCHEOLOGICAL ARTIFACTS ARE DISCOVERED DURING REMEDIAL ACTIVITIES, THE SUBCONTRACTOR SHALL STOP WORK IMMEDIATELY AND NOTIFY RVAAP/SAIC. THE SUBCONTRACTOR SHALL NOT RESUME WORK UNTIL APPROVAL IS GRANTED BY RVAAP/SAIC AND THE SITE SAFETY AND HEALTH OFFICER.
14. SHOULD THE SUBCONTRACTOR DISCOVER UTILITIES NOT SHOWN ON THE DRAWINGS, EXCAVATION ACTIVITIES SHALL STOP IMMEDIATELY AND THE SUBCONTRACTOR SHALL NOTIFY RVAAP/SAIC. RVAAP/SAIC AND THE SUBCONTRACTOR SHALL DETERMINE THE DISPOSITION OF THE DISCOVERED UTILITY. THE SUBCONTRACTOR SHALL NOT RESUME WORK UNTIL APPROVAL IS GRANTED BY RVAAP/SAIC AND THE SITE SAFETY AND HEALTH OFFICER.
15. NO WORK SHALL TAKE PLACE DURING INCLEMENT WEATHER (AS DETERMINED BY RVAAP/SAIC) TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT RUNOFF.
16. DURING INSTANCES OF HIGH WINDS, WHICH COULD RESULT IN EXCESSIVE DUST, RVAAP/SAIC RESERVES THE RIGHT TO REQUIRE ADDITIONAL DUST CONTROL OR TO STOP WORK. THE SUBCONTRACTOR SHALL BE REQUIRED TO ALLOW FOR DELAYS WITHOUT ADDITIONAL CHARGES TO SAIC.
17. THE SUBCONTRACTOR SHALL NOT ALLOW HAUL TRUCKS TO TRACK SOIL/MUD ONTO PUBLIC OR RVAAP ROADWAYS. THE SUBCONTRACTOR SHALL INSPECT ALL HAUL TRUCKS WITHIN THE INSPECTION AREA BEFORE RELEASE TO PUBLIC ROADS. SOIL REMOVED FROM HAUL TRUCKS SHALL BE COLLECTED AND DISPOSED OF WITH EXCAVATED DRY SEDIMENT. ALL HAUL TRUCKS SHALL BE COVERED PRIOR TO DEPARTURE FROM THE PROJECT SITE.
18. THE SUBCONTRACTOR IS RESPONSIBLE FOR IMMEDIATELY REMOVING ANY MATERIAL SPILLED ON ROADWAYS OR TRACKED DURING IMPLEMENTATION OF THIS REMEDIAL DESIGN. THE SUBCONTRACTOR SHALL NOTIFY SAIC OF ANY OCCURRENCES.
19. THE SUBCONTRACTOR SHALL COORDINATE ALL WASTE MANAGEMENT ACTIVITIES WITH RVAAP/SAIC. WASTE HANDLING AND DISPOSAL ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH THIS REMEDIAL DESIGN, RVAAP REQUIREMENTS, AND APPLICABLE STATE AND FEDERAL REGULATIONS.
20. ALL EXCAVATED CONTAMINATED SOIL SHALL BE DISPOSED AT A REGULATED LANDFILL APPROVED BY RVAAP/SAIC.
21. ALL HAUL TRUCKS TRAVELING ON PUBLIC ROADS SHALL HAVE A BILL OF LADING OR MANIFEST SIGNED BY THE RVAAP FACILITY MANAGER.
22. THE SUBCONTRACTOR RESPONSIBLE FOR IMPLEMENTING CONSTRUCTION ACTIVITIES SHALL BE REQUIRED TO PREPARE A SITE SPECIFIC SAFETY AND HEALTH PLAN (SSHP) IN ACCORDANCE WITH OCCUPATIONAL, SAFETY AND HEALTH ADMINISTRATION (OSHA) GUIDELINES. THE PLAN SHOULD BE SUBMITTED FOR REVIEW AT LEAST 20 CALENDAR DAYS PRIOR TO INITIATION OF ANY REMEDIAL ACTION ACTIVITIES. THE PLAN SHALL BE REVIEWED BY SAIC PRIOR TO INITIATION OF ANY REMEDIAL ACTION.
23. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR FOLLOWING ALL RVAAP, FEDERAL, STATE, AND LOCAL SAFETY REQUIREMENTS FOR THE PROTECTION OF ALL PERSONS (INCLUDING EMPLOYEES) AND PROPERTY. IT IS ALSO THE SUBCONTRACTOR'S RESPONSIBILITY TO INITIATE, MAINTAIN, AND SUPERVISE ALL SAFETY REQUIREMENTS, PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK AND IN ACCORDANCE WITH THE RQL SITE SAFETY AND HEALTH PLAN (SSHP).
24. ALL SUBCONTRACTOR EMPLOYEES WORKING ON-SITE MUST ATTEND DAILY HEALTH AND SAFETY TAILGATE MEETINGS PRIOR TO THE START OF THE DAY'S CONSTRUCTION ACTIVITIES THAT WILL BE CONDUCTED BY THE SUBCONTRACTOR CONSTRUCTION SUPERVISOR AND THE SUBCONTRACTOR SITE SAFETY AND HEALTH OFFICER.
25. LOCKOUT/TAGOUT PROCEDURES SHALL COMPLY WITH OSHA REQUIREMENTS.
26. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE NATIONAL ELECTRIC CODE.
27. ALL FUEL AND/OR PETROLEUM PRODUCTS (E.G., LUBRICANTS) SHALL BE STORED AT THE EQUIPMENT STAGING AREA WITHIN SECONDARY CONTAINMENT. FUEL STORAGE CONTAINERS WILL BE DOUBLE LEAK-PROOF WITH A REGULATORY STANDARD AMOUNT OF FREE-BOARD. ALL FUEL CONTAINERS AND/OR TANKS WILL BE PROPERLY PLACARDED AND SECURED ACCORDING TO OSHA AND DOT REGULATIONS AND ADEQUATE SPILL CLEANUP EQUIPMENT AND MATERIALS WILL BE MAINTAINED AT THE FUEL-STORAGE SITE.
28. ALL STORMWATER CONTROLS AND PUMP EQUIPMENT SHALL BE INSPECTED DAILY AND REPAIRED/REPLACED AS NEEDED.
29. THE PROJECT SITE IS CONSIDERED TO BE THE RAMSDELL QUARRY LANDFILL (RQL) AREA OF CONCERN (AOC).
30. THE SUBCONTRACTOR WILL PROVIDE ALL NECESSARY ON-SITE SPILL EQUIPMENT (E.G. GRANULATED CLAY, ABSORBENT BLANKETS, PPE, SHOVELS, CONTAINERS). ALL SUBCONTRACTOR EMPLOYEES ON-SITE SHALL BE TRAINED ON PROPER USE OF SPILL EQUIPMENT AND CLEAN-UP OF IMPACTED MATERIAL IN THE EVENT OF A SPILL.
31. REMEDIAL DESIGN WORK PLAN AND SPECIFICATIONS SUPERSEDE DRAWINGS DETAILS IN EVENT OF CONFLICTS.
32. UXO TECHNICIANS WILL BE ON-SITE THROUGHOUT THE REMEDIAL ACTIVITIES IN ACCORDANCE WITH THE EXPLOSIVE SAFETY SUBMISSION. THE UXO TECHNICIANS WILL BE PROVIDED BY THE SUBCONTRACTOR.
33. A SPILL KIT, FIRST AID KIT, AND SITE SPECIFIC SAFETY AND HEALTH PLAN (SSHP) SHALL BE MAINTAINED ON-SITE BY THE SUBCONTRACTOR DURING CONSTRUCTION ACTIVITIES. THE SUBCONTRACTOR IS RESPONSIBLE FOR KEEPING THE SPILL KIT AND FIRST AID KIT SUPPLIED AS NECESSARY.
34. PRIOR TO THE START OF DAILY CONSTRUCTION ACTIVITIES THE SITE HEALTH AND SAFETY OFFICER IN CONJUNCTION WITH THE UXO TECHNICIAN WILL CONDUCT AND RECORD DAILY TAILGATE MEETINGS ADDRESSING THE POTENTIAL HAZARDS ASSOCIATED WITH THE PLANNED CONSTRUCTION ACTIVITIES.
35. SUBCONTRACTOR SHALL PROVIDE A CERTIFICATION OF THE DECONTAMINATION OF ALL EXCAVATION EQUIPMENT PRIOR TO REMOVING THE EQUIPMENT FROM THE CONSTRUCTION SITE.

MATERIAL NOTES

1. COMMON FILL AND VEGETATIVE COVER – THE SUBCONTRACTOR SHALL IDENTIFY A SOURCE FOR OFF-SITE COMMON FILL AND VEGETATION COVER. FOR EVERY 4,000 CUBIC YARDS ONE MULTI- INCREMENT SAMPLE SHALL BE COLLECTED. THE MATERIAL SHALL BE TESTED AND COMPARED AGAINST THE PARAMETERS LISTED IN SECTION 9.0 OF THE RD. PROPOSED OFF-SITE SOURCES MUST BE APPROVED BY OHIO EPA PRIOR TO USE. BACKFILL MUST BE CLEAN AND BE ABLE TO PROMOTE VEGETATION GROWTH. SAIC RESERVES THE RIGHT (AT NO ADDITIONAL COST TO SAIC) TO REJECT FILL MATERIAL IF MATERIAL IS NOT CONSIDERED CLEAN.
2. RECEIVED VEGETATIVE COVER SHALL NOT HAVE A PH LOWER THAN 5.0 OR HIGHER THAN 7.0 TESTED IN ACCORDANCE WITH ASTM D4972. SUBCONTRACTOR SHALL OBTAIN AND APPLY A PRESCRIBED SEEDING MIXTURE PLAN AS DESCRIBED IN SECTION 9.0 OF THE RD.
3. GEOTEXTILE – GEOTEXTILE FABRIC SHALL COMPLY WITH ODOT SPECIFICATION 712, MISCELLANEOUS MATERIALS, TYPE D (712.09).
4. EROSION AND SEDIMENTATION CONTROLS – PLACEMENT AND ANCHORING OF EROSION AND SEDIMENTATION CONTROL SHALL BE COMPLETED IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS, DRAWINGS C-4, C-7 & C-8 AND RAINWATER AND LAND DEVELOPMENT MANUAL (ODNR 2006).

LIST OF SPECIFICATIONS

1. OHIO ARMY NATIONAL GUARD APPROVED GRASS SEED MIXES FOR TEMPORARY COVER AND FINAL SITE CLOSURES (JUNE 2005)
2. BORROW SOURCE (SOIL) IN ACCORDANCE WITH SECTION 9.0 OF THE RD.

ESTIMATED WASTE QUANTITIES

	ESTIMATED IN SITU AMOUNTS		
WASTE MATERIAL	SURFACE AREA (YD2)	VOLUME(1) (YD3)	WEIGHT(2) (TONS)
RQL-034M	2,341	455	728
RQL-037M	4,869	946	1,515
RQL-039M	656	128	204
RQL-040M	403	78	125
TOTALS	8,269	1,607	2,572

ESTIMATED RESTORATION MATERIAL QUANTITIES

MATERIAL TYPE	QUANTITY
BACKFILL	APPROX. EQUAL TO WASTE QUANTITIES
SILT FENCE (L.F.)	890
SEED (LBS.)(3)	17
WETLAND SEED (LBS.)(4)	26
NO. 2 STONE (TONS)(5)	521
NO. 57 STONE (TONS)(5)	174
STRAW BALES (#)(6)	293
SAND BAGS (L.F.)	AS NEEDED

NOTES:

1. ASSUMES A 7 IN. AVERAGE SOIL DEPTH.
2. ASSUMES 1.6 TONS/CU.YD. SOIL DENSITY.
3. ASSUMING AN APPLICATION RATE OF 30 LBS./ACRE, IN CONSTRUCTION SUPPORT AREAS.
4. ASSUMING AN APPLICATION RATE OF 15 LBS/ACRE IN QUARRY BOTTOM.
5. ASSUMING 100 LBS./CU.FT.
6. ASSUMING AN APPLICATION RATE OF 3 BALES PER 1,000 SQ.FT.
7. SUBCONTRACTOR SHALL VERIFY QUANTITIES.

LEGEND FOR ALL DRAWINGS

- TREE LINE
- RAILROAD
- ROADWAY
- ACCESS ROAD
- 2' CONTOUR
- 10' CONTOUR
- LANDFILL BOUNDARY (APPROX.)
- CONSTRUCTION BOUNDARY
- EQUIPMENT MOVEMENT AREA BOUNDARY
- SF — SILT FENCE
- MRS BOUNDARY
- MI SAMPLE AREA BOUNDARY
- POTENTIAL MAXIMUM SURFACE WATER ELEVATION
- UTILITY POLE
- SURVEY CONTROL POINT
- MONITORING WELL LOCATION
- DISCRETE SURFACE SOIL SAMPLE LOCAITON
- SURVEY CONTROL POINT
- 1480 — CONCENTRATION OVER CLEANUP GOAL
- SANDBAGS
- HAUL TRUCK TRAFFIC ROUTE
- WATER, SURVEYED SEPT. 2007
- FORMER BUILDING LOCATION
- EXISTING BUILDING
- GRADE, SEED & STRAW AREA
- STONE – NO. 2
- EXCAVATION AREA
- CLEARING & GRUBBING
- WETLAND AREA
- MI SAMPLE AREAS EXCEEDING CLEANUP GOALS
- GROUND SURFACE (UNDISTURBED)
- COMPACTED BACKFILL
- GEOTEXTILE FABRIC
- SANDBAG
- WATER FLOW DIRECTION
- WATER SURFACE
- 1 / C-8 — DETAIL WITH DRAWING SHEET NUMBER
- 5A / C-8 — SECTION WITH DRAWING SHEET NUMBER
- P1 — PHOTOGRAPH NUMBER WITH VIEW DIRECTION

DRAWING INDEX

SURVEY CONTROL POINTS

POINT NO.	NORTHING	EASTING	ELEVATION
10001	566451.83	2375671.69	992.51
10002	566206.42	2376213.93	987.23

△ SURVEY CONTROL POINT
5/8" x 30" CAPPED REBAR LABELED "KS ASSOCS INC. TRAVERSE"

LIST OF PERMITS AND NOTIFICATIONS

1. UNITED STATES FISH AND WILDLIFE SERVICE ~ DETERMINATION OF NO EFFECT
2. OHIO HISTORIC PRESERVATION OFFICE SECTION 106 REVIEW
3. OHIO EPA NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) CONSTRUCTION GENERAL PERMIT NO. OHC000003
4. OHIO EPA GENERAL ISOLATED WETLAND PERMIT (LEVEL TWO)
5. PORTAGE COUNTY SOIL AND WATER CONSERVATION DISTRICT

LIST OF SUBMITTALS

1. SITE SAFETY AND HEALTH PLAN (SSHP) ADDENDUM
2. STORM WATER POLLUTION PREVENTION PLAN (SWP3)
3. BACKFILL SAMPLE RESULTS
4. VEGETATIVE COVER (TOP SOIL) SAMPLE RESULTS
5. CONSTRUCTION REPORT
6. WASTE PROFILES
7. FINAL WASTE MANIFESTS FOR CONTAMINATED SOIL
8. CONFIRMATION SAMPLE RESULTS

REMEDIAL ACTION CLEANUP GOALS

CONSTITUENT OF CONCERN	CLEANUP GOAL (mg/kg)
BENZ(a)ANTHRACENE	13
BENZO(a)PYRENE	1.3
BENZO(b)FLUORANTHENE	13
DIBENZ(a,h)ANTHRACENE	1.3
INDENO(1,2,3-cd)PYRENE	13

DATE: 02/06/09 PROJECT NO. 04-3266-403 SCALE: NO SCALE

DESIGNED BY: PAH DRAWN BY: CHECKED BY: T. RUTLEDGE APPROVED BY: J. THOMAS

PROJECT: RAMSDELL QUARRY LANDFILL REMEDIAL DESIGN

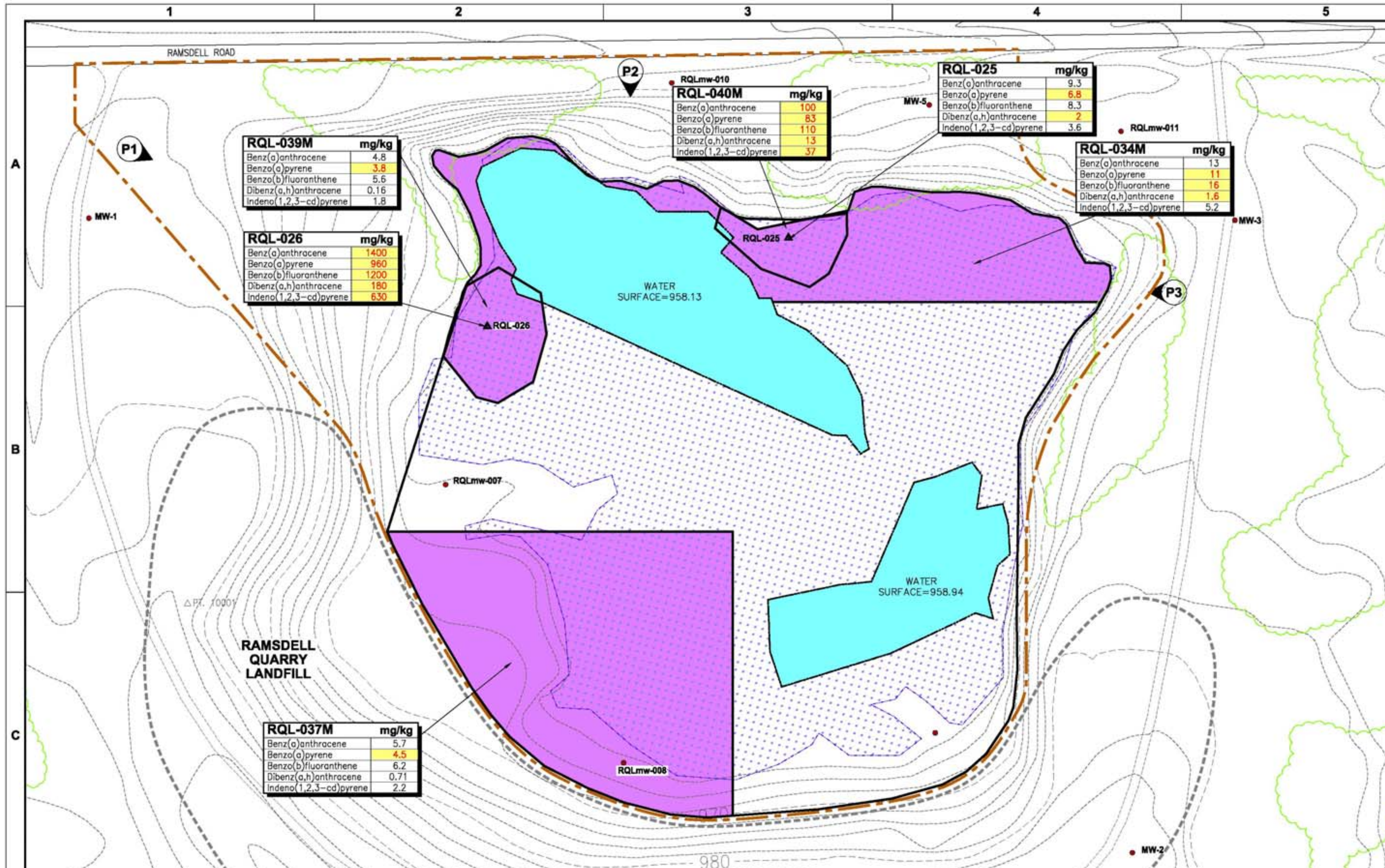
DRAWING TITLE: GENERAL NOTES

CLIENT: US Army Corps of Engineers
Ravenna Army Ammunition Plant
Ravenna, Ohio

US Army Corps of Engineers® Louisville District

SAIC® From Science to Solutions

C-2
DRAWING NUMBER



RQL-039M	mg/kg
Benz(a)anthracene	4.8
Benzo(a)pyrene	3.8
Benzo(b)fluoranthene	5.6
Dibenz(a,h)anthracene	0.16
Indeno(1,2,3-cd)pyrene	1.8

RQL-026	mg/kg
Benz(a)anthracene	1400
Benzo(a)pyrene	960
Benzo(b)fluoranthene	1200
Dibenz(a,h)anthracene	180
Indeno(1,2,3-cd)pyrene	630

RQL-040M	mg/kg
Benz(a)anthracene	100
Benzo(a)pyrene	83
Benzo(b)fluoranthene	110
Dibenz(a,h)anthracene	13
Indeno(1,2,3-cd)pyrene	37

RQL-025	mg/kg
Benz(a)anthracene	9.3
Benzo(a)pyrene	6.8
Benzo(b)fluoranthene	8.3
Dibenz(a,h)anthracene	2
Indeno(1,2,3-cd)pyrene	3.6

RQL-034M	mg/kg
Benz(a)anthracene	13
Benzo(a)pyrene	11
Benzo(b)fluoranthene	16
Dibenz(a,h)anthracene	1.6
Indeno(1,2,3-cd)pyrene	5.2

RQL-037M	mg/kg
Benz(a)anthracene	5.7
Benzo(a)pyrene	4.5
Benzo(b)fluoranthene	6.2
Dibenz(a,h)anthracene	0.71
Indeno(1,2,3-cd)pyrene	2.2

LEGEND:

- TREE LINE
- ROADWAY
- ACCESS ROAD
- 2' CONTOUR
- 10' CONTOUR
- LANDFILL BOUNDARY (APPROX.)
- CONSTRUCTION BOUNDARY
- MRS BOUNDARY
- POTENTIAL MAXIMUM SURFACE WATER ELEVATION
- 1480 CONCENTRATION OVER CLEANUP GOAL
- MI SAMPLE AREAS EXCEEDING CLEANUP GOALS
- WETLAND AREA
- WATER, SURVEYED SEPT. 2007
- P1 PHOTOGRAPH NUMBER WITH VIEW DIRECTION
- UTILITY POLE
- SURVEY CONTROL POINT
- MONITORING WELL LOCATION
- DISCRETE SOIL SAMPLE LOCATION

NOTES:

1. CONTRACTOR SHALL VERIFY EXISTING SITE CONDITIONS.

P1 LOOKING SOUTHEAST
NOT TO SCALE

P2 LOOKING SOUTH
NOT TO SCALE

P3 LOOKING WEST
NOT TO SCALE

NORTH
0 20 40 80
SCALE: 1" = 40'

DATE: 06/19/09 | SCALE: 1" = 40'-0" | DRAWN BY: RAH | DESIGNED BY: J. THOMAS
PROJECT NO. 04-3266-505 | CHECKED BY: T. RUTLEDGE | APPROVED BY: J. THOMAS

REV.	DATE	DESCRIPTIONS	DRAWN BY	CHECKED BY

PROJECT: RAMSDELL QUARRY LANDFILL REMEDIAL DESIGN

DRAWING TITLE: EXISTING SITE CONDITIONS

CLIENT: US Army Corps of Engineers
Ravenna Army Ammunition Plant
Ravenna, Ohio

US Army Corps of Engineers® Louisville District

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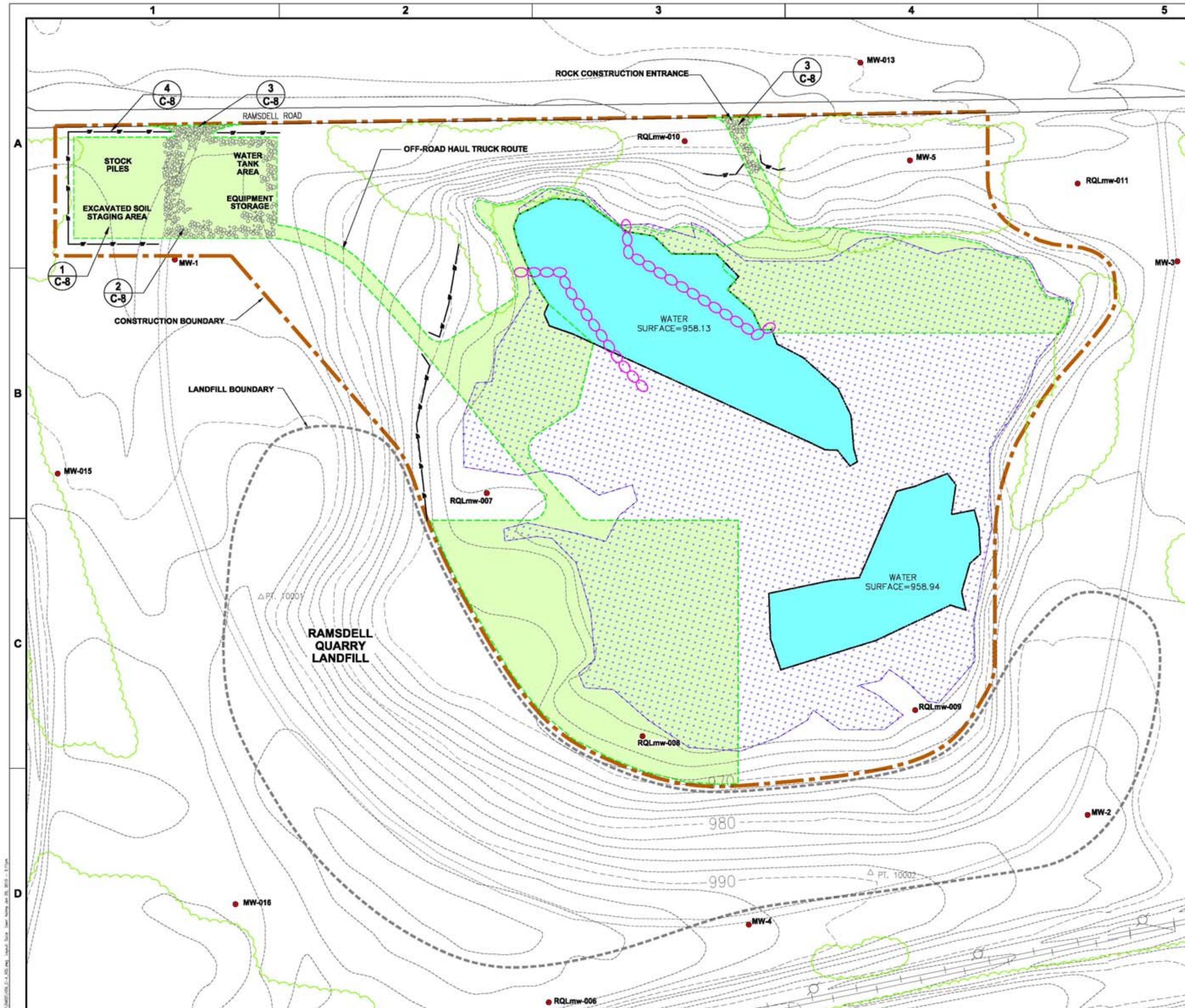
C-3

DRAWING NUMBER



NOTES:

1. DRAWINGS AND NOTES SERVE ONLY AS GUIDELINES. ALL STORMWATER CONTROLS SHALL MEET OHIO'S "RAINWATER AND LAND DEVELOPMENT" STANDARDS.
2. CONSTRUCTION ACTIVITIES WILL BE CONDUCTED IN A MANNER TO MINIMIZE IMPACTS TO WETLANDS.
3. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL STORMWATER CONTROLS (e.g., SILT FENCE, SANDBAG BERMS, ROCK CONSTRUCTION ENTRANCE). DAILY INSPECTIONS SHALL BE CONDUCTED BY THE SUBCONTRACTOR. IN ADDITION, STORMWATER CONTROLS SHALL BE INSPECTED WITHIN 24 HOURS OF A STORM EVENT GREATER THAN 0.5 INCHES.
4. ACCESS IMPROVEMENTS SHALL BE REQUIRED AS NEEDED TO SUPPORT CONSTRUCTION ACTIVITIES. IMPROVEMENTS SHALL PREVENT DUST, TIRE RUTTING, AND SEDIMENTATION TO LOW-LYING AREAS.
5. PRIOR TO EXCAVATION ACTIVITIES THE SUBCONTRACTOR SHALL INSTALL A WATER TIGHT BARRIER, (e.g., SANDBAGS, EARTHEN BERM, OR TEMPORARY COFFERDAM) TO DEWATER THE EXCAVATION AREA (C-5) AND ADJACENT WORK AREA. WATER LEVELS WITHIN THE QUARRY VARY SEASONALLY AND LOCATION OF THE SANDBAGS IS ONLY PROVIDED AS GUIDANCE. THE WATER MUST BE CONTAINED WITHIN THE QUARRY OR PUMPED OFF UNTIL RESTORATION ACTIVITIES ARE COMPLETED.
6. THE SUBCONTRACTOR SHALL CLEAR TREES AND VEGETATION IN AREAS NOTED ON THIS DRAWING. ROOT BALLS WITHIN THE EXCAVATION AREA SHALL BE REMOVED AND DISPOSED OF WITH EXCAVATED SOILS.
7. TREES AND VEGETATION SHALL BE MANAGED IN ACCORDANCE WITH SECTION 10 OF THE RQL RD.
8. EXCAVATION CONTACT WATER SHALL BE COLLECTED AND STORED IN A PORTABLE WATER TANK PROVIDED BY THE SUBCONTRACTOR. THE TANK SHALL BE MAINTAINED AT THE DESIGNATED EQUIPMENT STAGING AREA WITH SECONDARY CONTAINMENT. EXCAVATION CONTACT WATER SHALL BE MANAGED IN ACCORDANCE WITH SECTION 9 OF THE RD.
9. EQUIPMENT SHALL BE DECONTAMINATED IN A PORTABLE DECONTAMINATION PAD OR OVER THE LAST HAUL TRUCK BED. IF A DECONTAMINATION PAD IS NEEDED IT SHALL BE SUPPLIED AND CONSTRUCTED BY THE SUBCONTRACTOR. THE LOCATION OF THE PAD SHALL BE DETERMINED BY THE SUBCONTRACTOR AND APPROVED BY SAIC.
10. COLLECTED RAIN WATER OR RUN-OFF WATER THAT IS LADEN WITH SEDIMENT (FROM EXCAVATION AREA OR FROM GROUND SURFACE) SHALL NOT BE DISCHARGED TO ANY WATER SOURCE.
11. EXCAVATIONS AND STAGED SOIL PILES SHALL BE COVERED AT THE END OF EACH DAY AND DURING INCLEMENT WEATHER WITH IMPERMEABLE COVERS OR TARPS PROVIDED BY THE SUBCONTRACTOR AND SECURED WITH SANDBAGS. STORMWATER COLLECTED ON THE IMPERMEABLE EXCAVATION COVERS MAY BE DISCHARGED THROUGH SEDIMENT BAG OVER GROUND SURFACE.
12. THE MEC AVOIDANCE SUBCONTRACTOR MUST GIVE CLEARANCE OF ADDITIONAL AREAS REQUIRED FOR SITE PREPARATION AND REMEDIAL ACTIVITIES PRIOR TO ACCESS BY ANY ON-SITE PERSONNEL.
13. THE SUBCONTRACTOR SHALL TAKE CARE TO PROTECT EXISTING MONITORING WELLS. THE SUBCONTRACTOR WILL BE RESPONSIBLE TO REPAIR ANY DAMAGE TO WELLS AS A RESULT OF CONSTRUCTION ACTIVITIES.

LEGEND:

- TREE LINE
- ROADWAY
- ACCESS ROAD
- RAILROAD
- 2' CONTOUR
- 10' CONTOUR
- LANDFILL BOUNDARY (APPROX.)
- CONSTRUCTION BOUNDARY
- MRS BOUNDARY
- SILT FENCE
- UTILITY POLE
- SURVEY CONTROL POINT
- SANDBAGS
- MONITORING WELL LOCATION
- WETLAND AREA
- WATER, SURVEYED SEPT. 2007
- STONE - NO. 2
- CLEARING & GRUBBING
- DETAIL WITH DRAWING SHEET NUMBER

NORTH

SCALE: 1" = 40'

DATE: 06/19/2009 SCALE: 1" = 40'-0"

PROJECT: Ramsdell Quarry Landfill Remedial Design

DRAWING TITLE: CONSTRUCTION SITE PLAN

CLIENT: US Army Corps of Engineers, Ravenna Army Ammunition Plant, Ravenna, Ohio

US Army Corps of Engineers® Louisville District

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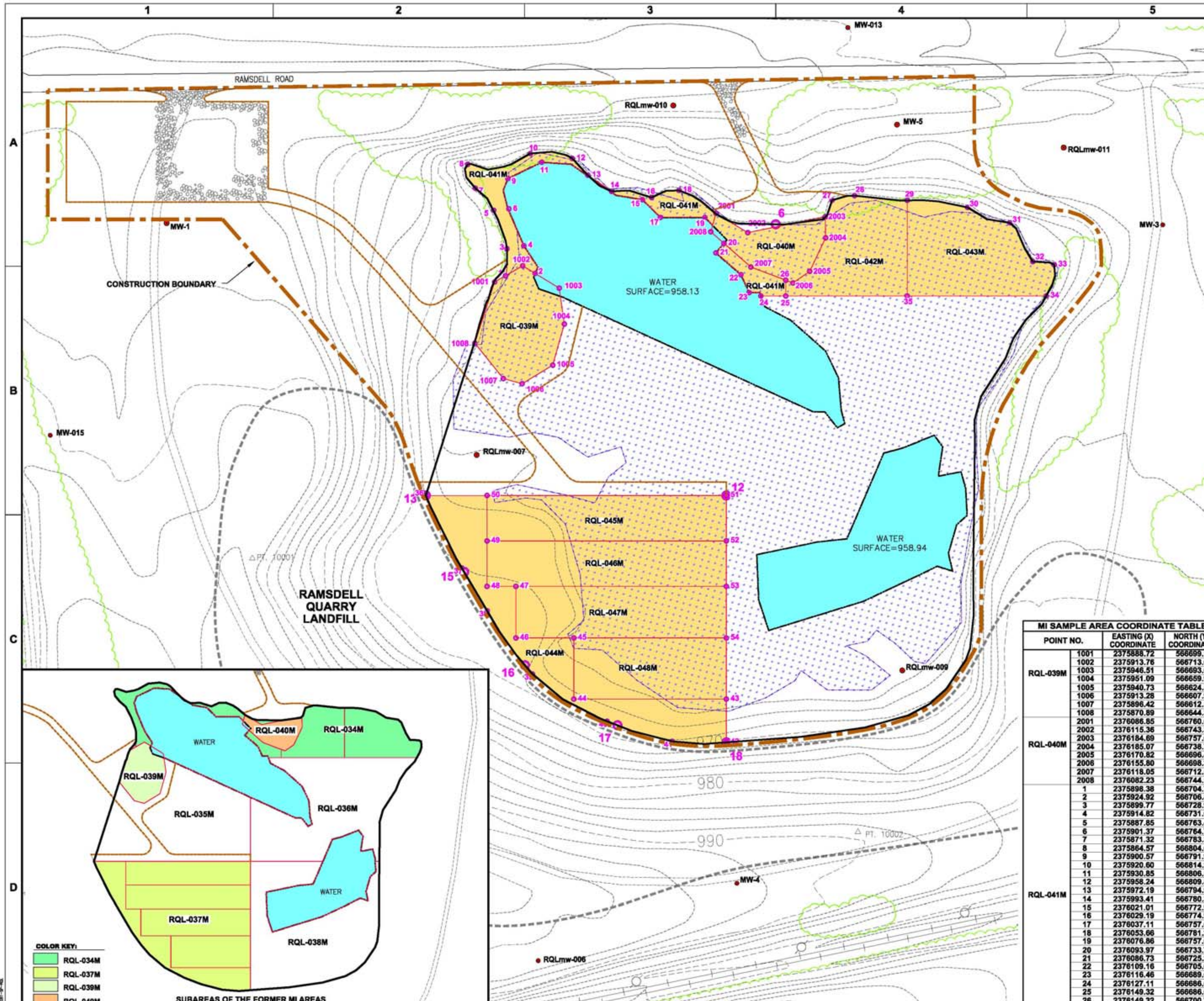
C-4

DRAWING NUMBER



MI SAMPLE AREA COORDINATE TABLE

POINT NO.		EASTING (X) COORDINATE	NORTH (Y) COORDINATE
RQL-039M	1001	2375888.72	566699.19
	1002	2375913.76	566713.63
	1003	2375946.51	566693.65
	1004	2375951.09	566659.92
	1005	2375940.73	566624.59
	1006	2375913.28	566607.98
	1007	2375896.42	566612.56
	1008	2375870.89	566644.32
RQL-040M	2001	2376086.85	566760.69
	2002	2376115.36	566743.36
	2003	2376184.69	566757.61
	2004	2376185.07	566738.75
	2005	2376170.82	566696.43
	2006	2376155.80	566698.33
	2007	2376118.05	566712.57
	2008	2376082.23	566744.13
RQL-041M	1	2375898.38	566704.77
	2	2375924.92	566706.83
	3	2375899.77	566728.92
	4	2375914.82	566731.66
	5	2375887.85	566763.40
	6	2375901.37	566764.78
	7	2375871.32	566783.31
	8	2375864.57	566804.60
	9	2375900.57	566791.91
	10	2375920.60	566814.27
	11	2375930.85	566806.53
	12	2375958.24	566809.89
	13	2375972.19	566794.92
	14	2375993.41	566780.33
	15	2376021.01	566772.94
	16	2376029.19	566774.92
	17	2376037.11	566757.05
	18	2376053.66	566781.26
	19	2376076.86	566757.00
	20	2376093.97	566733.79
	21	2376086.73	566725.22
	22	2376109.16	566705.68
	23	2376116.46	566689.68
	24	2376127.11	566686.64
	25	2376149.32	566686.64
	26	2376149.32	566700.77

NORTH

0 20 40 80

SCALE: 1" = 40'

MI SAMPLE AREA COORDINATE TABLE

POINT NO.		EASTING (X) COORDINATE	NORTH (Y) COORDINATE
RQL-042M	25	2376149.32	566686.64
	26	2376149.32	566700.77
	27	2376190.78	566772.44
	28	2376210.85	566776.60
	29	2376258.07	566772.27
	35	2376258.07	566686.64
RQL-043M	29	2376258.07	566772.27
	30	2376312.12	566766.04
	31	2376349.98	566752.26
	32	2376370.49	566717.35
	33	2376389.64	566714.60
	34	2376382.49	566686.64
	35	2376258.07	566686.64
RQL-044M	36	2375827.10	566508.06
	37	2375859.40	566442.96
	38	2375882.03	566404.64
	39	2375922.54	566348.01
	40	2375989.34	566305.69
	41	2376047.50	566287.60
	42	2376096.12	566286.78
	43	2376096.12	566325.50
	44	2375959.54	566325.50
	45	2375959.54	566380.29
	46	2375907.68	566380.29
	47	2375907.68	566426.54
	48	2375881.85	566426.54
	49	2375881.85	566467.30
	50	2375881.85	566508.06
RQL-045M	49	2375881.85	566467.30
	50	2375881.85	566508.06
	51	2376096.12	566508.06
	52	2376096.12	566467.30
RQL-046M	48	2375881.85	566426.54
	49	2375881.85	566467.30
	52	2376096.12	566467.30
	53	2376096.12	566426.54
RQL-047M	46	2375907.68	566380.29
	47	2375907.68	566426.54
	53	2376096.12	566426.54
	54	2376096.12	566380.29
RQL-048M	43	2376096.12	566325.50
	44	2375959.54	566325.50
	45	2375959.54	566380.29
	54	2376096.12	566380.29

LEGEND:

- TREE LINE
- ROADWAY
- ACCESS ROAD
- RAILROAD
- 2' CONTOUR
- 10' CONTOUR
- LANDFILL BOUNDARY (APPROX.)
- CONSTRUCTION BOUNDARY
- MRS BOUNDARY
- MI SAMPLE AREA BOUNDARY
- POTENTIAL MAXIMUM SURFACE WATER ELEVATION
- EQUIPMENT MOVEMENT AREA BOUNDARY
- UTILITY POLE
- SURVEY CONTROL POINT
- MONITORING WELL LOCATION
- COORDINATE POINT
- WETLAND AREA
- WATER, SURVEYED SEPT. 2007
- STONE – NO. 2
- EXCAVATION AREA
- DETAIL WITH DRAWING SHEET NUMBER (1 / C-8)

NOTES:

1. CONTRACTOR SHALL USE CAUTION WHILE EXCAVATION NEAR LANDFILL BOUNDARY. IN THE EVENT DEBRIS IS EXPOSED CONSTRUCTION ACTIVITIES WILL STOP AND RVAAP, SAIC AND OHIO EPA WILL BE NOTIFIED IMMEDIATELY.

SEQUENCE OF CONSTRUCTION

1. SURVEY AND ESTABLISH MI AREA BOUNDARIES & EQUIPMENT MOVEMENT AREAS WITHIN FORMER QUARRY.
2. COMPLETE MI SAMPLING OF MI AREAS RQL-041M THROUGH RQL-048M.
3. APPLY WETLAND HERBICIDE TO REMOVAL AREAS AND EQUIPMENT MOVEMENT AREAS WITHIN FORMER QUARRY.
4. PERFORM MEC CLEARANCE IN EQUIPMENT MOVEMENT AND EXCAVATION AREAS WITHIN MRS BOUNDARY.
5. CONSTRUCTION SITE SETUP AS DETAILED ON DRAWINGS C-4, C-6 AND C-8.
6. PERFORM SOIL REMOVAL OPERATIONS.
7. CONFIRM EXCAVATION CLEANUP GOALS IN ACCORDANCE WITH THE RD.
8. SURVEY SOIL REMOVAL AREA BASED ON LIMITS OF EXCAVATION.
9. RESTORE IN ACCORDANCE WITH SPECIFICATIONS ON DRAWING C-7 AFTER ACHIEVEMENT OF CLEANUP GOALS AND APPROVAL FROM USACE/SAIC.
10. REMOVE STORMWATER CONTROLS ONCE VEGETATION IS RE-ESTABLISHED AS SPECIFIED IN THE RD.

DATE: 06/19/09 SCALE: 1" = 40'-0"

PROJECT: RAMSDELL QUARRY LANDFILL REMEDIAL DESIGN

DRAWING TITLE: SOIL REMOVAL AND SAMPLING PLAN

CLIENT: US Army Corps of Engineers Ravenna Army Ammunition Plant Ravenna, Ohio

US Army Corps of Engineers® Louisville District

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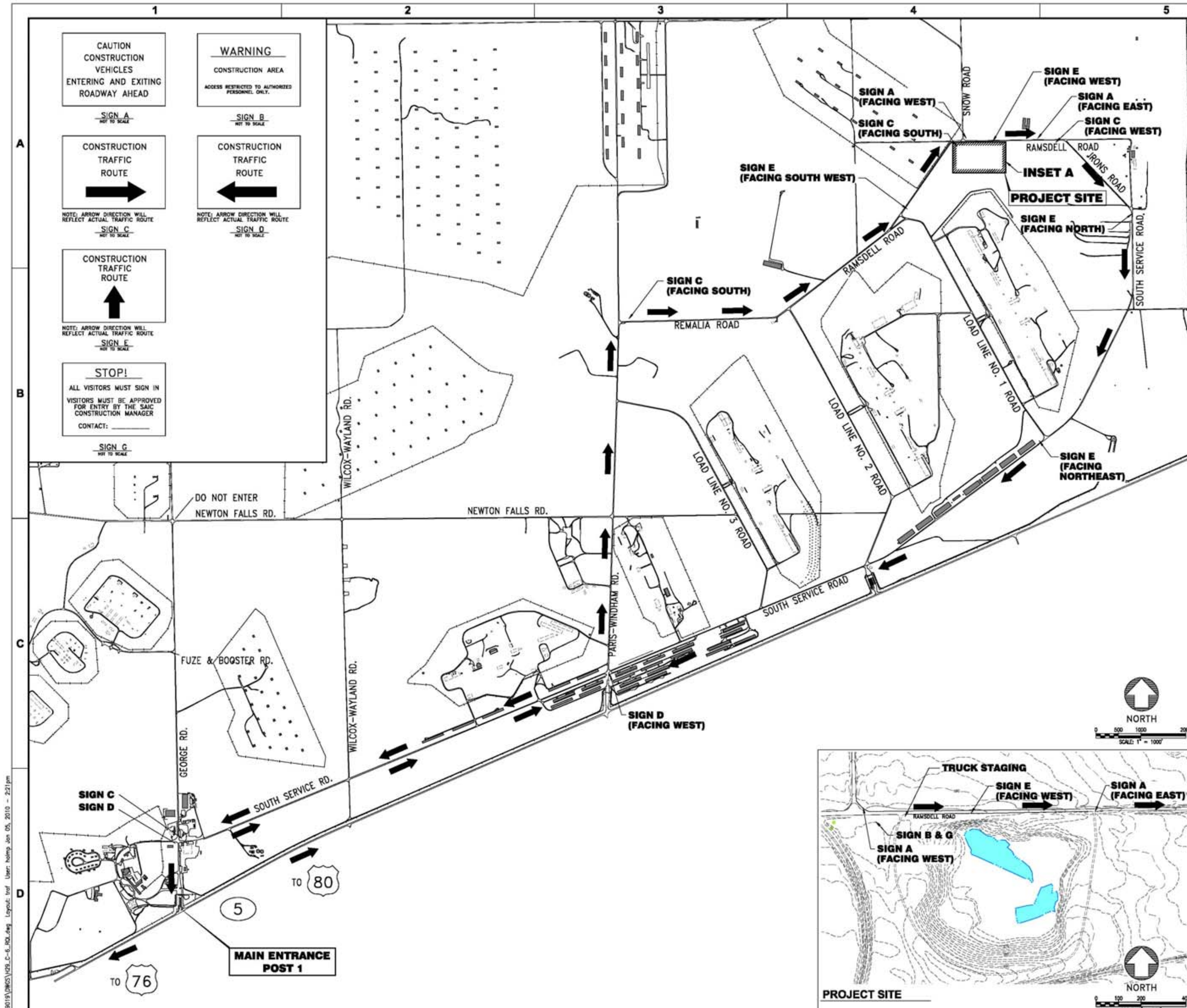
C-5

DRAWING NUMBER



NOTES:

1. ALL VEHICLES MUST ENTER RVAAP/CAMP RAVENNA THROUGH THE MAIN ENTRANCE POST 1 (8454 STATE RT. 5, RAVENNA, OHIO 44266).
2. ALL VEHICLES AND CONTENTS ARE SUBJECT TO SEARCH AND INSPECTION.
3. NO WEAPONS, LIGHTERS OR SIMILAR FIRE STARTERS, OR ALCOHOL ARE PROHIBITED ONSITE. PROHIBITED ITEMS MAY BE LEFT WITH SECURITY WHILE ONSITE. SECURITY WILL CONFISCATE ANY PROHIBITED ITEMS DISCOVERED DURING INSPECTIONS.
4. ALL PERSONNEL ENTERING RVAAP/CAMP RAVENNA MUST COMPLETE SECURITY FORMS AND COORDINATE ENTRY WITH RVAAP SECURITY ((330) 358-2017) AND RVAAP OPERATIONS AND MAINTENANCE CONTRACTOR ((330) 358-3005) BEFORE ARRIVING AT THE PLANT.
5. ALL ON-ROAD HAUL TRUCKS WILL ADHERE TO ODOT TRANSPORTATION GUIDELINES. THE SUBCONTRACTOR IS RESPONSIBLE FOR ENSURING TRUCKS DO NOT EXCEED 80,000 lbs GROSS WEIGHT.
6. ALL HAUL TRUCKS WILL HAVE OPERATIONAL LOAD COVERS IN GOOD CONDITION (I.E., FREE OF HOLES, TEARS). LOADS WILL BE COVERED PRIOR TO DEPARTING THE PROJECT AREA AND WILL STAY IN PLACE UNTIL UNLOADING AT THE APPROVED DISPOSAL SITE.
7. ON-ROAD HAUL TRUCKS HAULING HAZARDOUS WASTE SHALL BE LINED IN ACCORDANCE WITH THE APPROVED DISPOSAL FACILITY REQUIREMENTS.
8. SPEED LIMITS OF 35 MILES PER HOUR (MPH) DURING DAYLIGHT HOURS AND 25 MPH AT NIGHT IN THE RVAAP/CAMP RAVENNA WILL BE MAINTAINED.
9. ROADS SHALL NOT BE BLOCKED. RVAAP/CAMP RAVENNA TRAFFIC SHALL BE MAINTAINED ON AT LEAST ONE HALF OF THE ROADWAY WIDTH AT ALL TIMES.
10. SUBCONTRACTOR SHALL CONFIRM NO OVERHEAD HAZARDS (I.E., POWER LINES), MANHOLES, AND WATER VALVES WILL IMPEDE REMEDIAL ACTIVITIES.
11. SIGN LETTERING SHALL BE BLACK ON A FLUORESCENT ORANGE BACKGROUND WITH A BAKED ENAMEL FINISH. LETTERING SHALL NOT BE LESS THAN 2 INCHES HIGH. SIGNS WILL BE CONSTRUCTED AS AN A-FRAME STYLE SUCH THAT THEY CAN BE EASILY PLACED AND REMOVED BY SUBCONTRACTOR.
12. SIGNS WILL BE PLACED ALONG ROADWAYS DURING CONSTRUCTION MOBILIZATION. SIGNS WILL BE WEIGHED DOWN (POSSIBLY WITH SANDBAGS) TO ENSURE THEY DO NOT MOVE DURING HIGH WIND EVENTS. DURING EXTENDED TIME AWAY FROM THE PROJECT SITE (E.G., DURING CONFIRMATION SAMPLE ANALYSIS), THE SIGNS WILL BE REMOVED FROM THE ROADWAY AND PLACED IN STORAGE.
13. THE SUBCONTRACTOR WILL BE RESPONSIBLE TO REPAIR ANY DAMAGES TO RVAAP ROADS AS A RESULT OF HIS OR HIS SUBCONTRACTORS ACTIONS.

LEGEND:

- FENCE
- ROADWAY
- MRS BOUNDARY
- EXISTING BUILDING
- FORMER BUILDING LOCATION
- TRUCK TRAFFIC ARROW
- WATER, SURVEYED SEPT. 2007

DATE: 07/14/09 | SCALE: 1"=1000' | DRAWN BY: KKC | DESIGNED BY: | PROJECT NO. 04-3384-802 | CHECKED BY: | APPROVED BY:

PROJECT: Ramsdell Quarry Landfill Remedial Design

DRAWING TITLE: TRAFFIC MANAGEMENT PLAN

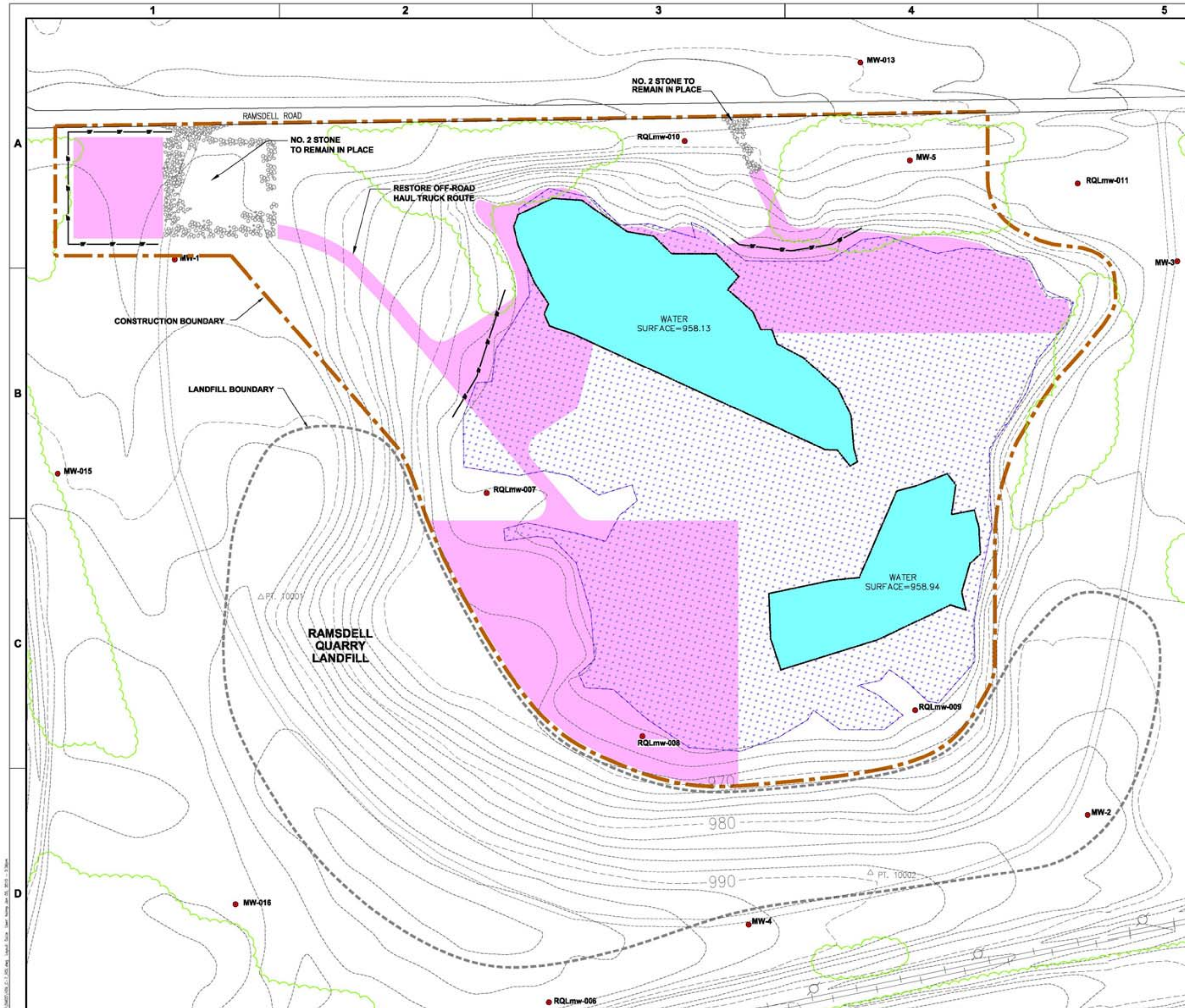
CLIENT: US Army Corps of Engineers, Ravenna Army Ammunition Plant, Ravenna, Ohio

US Army Corps of Engineers® Louisville District

SAIC® From Science to Solutions

C-6

DRAWING NUMBER



NOTES:

1. EXCAVATION AREAS SHALL BE BACKFILLED AND GRADED TO MAINTAIN DRAINAGE AND MINIMIZE PONDING.
2. SUBCONTRACTOR SHALL RESTORE ALL DISTURBED AREAS IN ACCORDANCE WITH THE OHIO ARMY NATIONAL GUARD APPROVED GRASS SEED MIXES FOR TEMPORARY COVER AND FINAL SITE CLOSURES SPECIFICATIONS DETAILED IN THE RQL RD.
3. SUBCONTRACTOR SHALL USE WETLAND SEED MIX IN DELINEATED WETLAND AREAS (SEE TABLE 9-3 OF RD). OTHER AREAS WILL BE SEEDED WITH THE OPEN AREA SEED MIXTURE (SEE TABLE 9-4 OF RD).
4. SILT FENCE SHALL REMAIN IN PLACE UNTIL SEED HAS TAKEN ROOT AND AT LEAST 70% COVER HAS BEEN ACHIEVED (AS APPROVED BY USACE/SAIC).
5. ALL PROJECT SIGNS NOTED ON DRAWING C-6 SHALL BE REMOVED AFTER RESTORATION ACTIVITIES ARE COMPLETED.
6. THE SUBCONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF GEOTEXTILE FABRIC AND STORMWATER CONTROLS.
7. THE SUBCONTRACTOR SHALL APPLY AND GRADE ONE 4-INCH LIFT OF NO. 57 STONE TO INSTALLED ROCK AREAS.

LEGEND:

- TREE LINE
- ROADWAY
- ACCESS ROAD
- RAILROAD
- 2' CONTOUR
- 10' CONTOUR
- LANDFILL BOUNDARY (APPROX.)
- CONSTRUCTION BOUNDARY
- MRS BOUNDARY
- SILT FENCE
- UTILITY POLE
- SURVEY CONTROL POINT
- MONITORING WELL LOCATION
- WETLAND AREA
- WATER, SURVEYED SEPT. 2007
- STONE – NO. 2
- GRADE, SEED & STRAW AREA
- DETAIL WITH DRAWING SHEET NUMBER (1 / C-8)

PROJECT: Ramsdell Quarry Landfill Remedial Design

DRAWING TITLE: SITE RESTORATION PLAN

CLIENT: US Army Corps of Engineers Ravenna Army Ammunition Plant Ravenna, Ohio

US Army Corps of Engineers® Louisville District

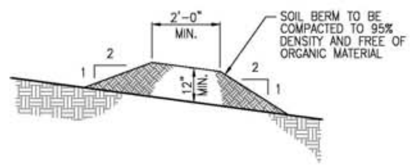
SAIC® From Science to Solutions

DATE: 07/14/2009 SCALE: 1" = 40'-0" DRAWN BY: PAH

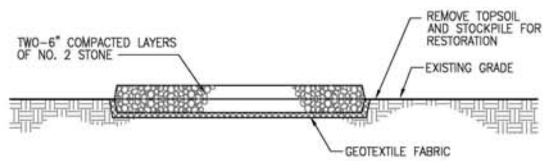
PROJECT NO. 04-3266-803

C-7

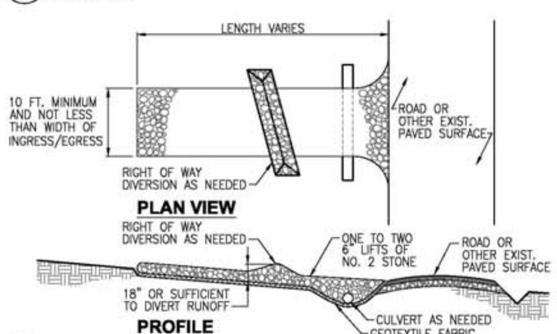
DRAWING NUMBER



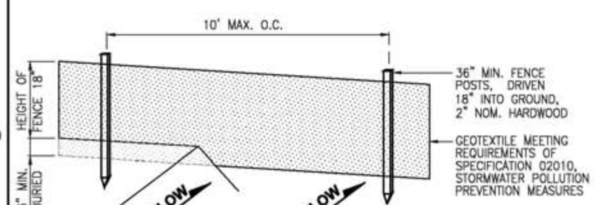
1 / C-8 SOIL BERM DETAIL
NOT TO SCALE



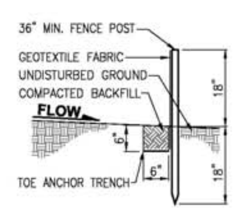
2 / C-8 STONE SURFACE AREA
NOT TO SCALE



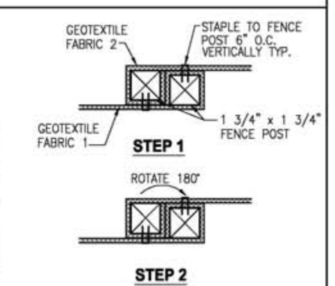
3 / C-8 ROCK CONSTRUCTION ENTRANCE DETAIL
NOT TO SCALE



PERSPECTIVE VIEW



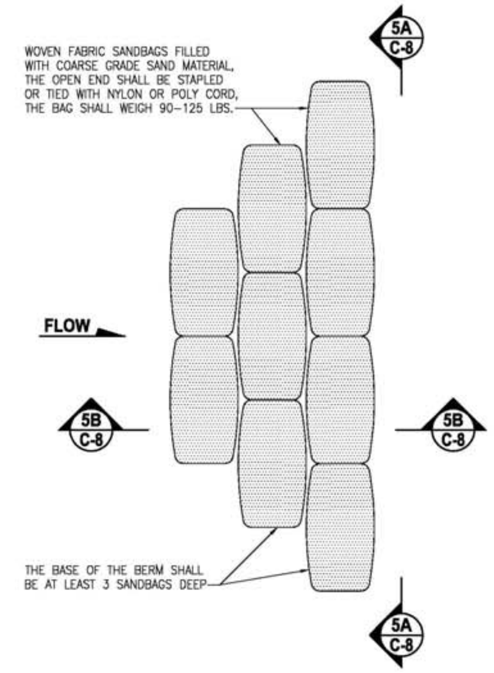
FENCE SECTION



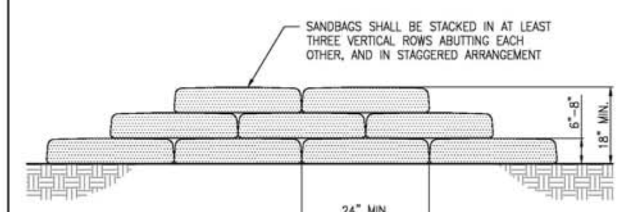
① ROTATE BOTH POST WITH FABRIC CLOCKWISE AT LEAST 180°
② EMBED BOTH POST INTO GROUND PER APPLICABLE FILTER FENCE SPECIFICATIONS

SILT FENCE CONNECTION POINT

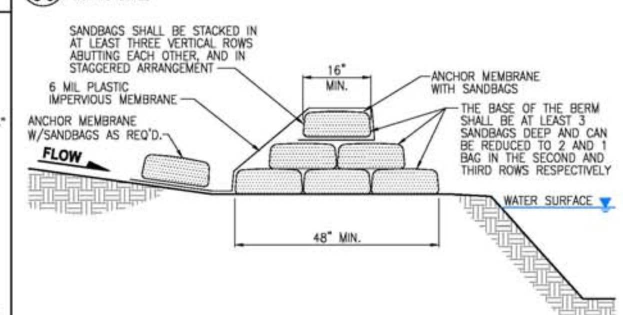
4 / C-8 SILT FENCE DETAILS
NOT TO SCALE



5 / C-8 SAND BAG BERM DETAIL
NOT TO SCALE



5A / C-8 SAND BAG FRONT ELEVATION
NOT TO SCALE



5B / C-8 SAND BAG SECTION
NOT TO SCALE

NOTES:

1. ENDS OF SILT FENCE SHALL BE INSTALLED UP SLOPE OF REMAINING FENCE SO AS TO PREVENT RUNOFF FROM GOING AROUND.
2. SILT FENCE SHALL BE PULLED TIGHT TO PREVENT ANY SAGGING DURING RAIN EVENTS.
3. ONE 4-INCH LIFT OF NO. 57 STONE SHALL BE APPLIED AND GRADED TO THE STONE SURFACE AREA AND ROCK CONSTRUCTION ENTRANCE DURING SITE RESTORATION ACTIVITIES.

LEGEND:

- 1 / C-8 — DETAIL NUMBER WITH DRAWING SHEET NUMBER
- STONE – NO.2
- GROUND SURFACE (UNDISTURBED)
- COMPACTED BACKFILL
- GEOTEXTILE FABRIC
- SANDBAG
- WATER FLOW DIRECTION
- WATER SURFACE

STATE OF OHIO — JED H. THOMAS — E-70226 — REGISTERED PROFESSIONAL ENGINEER

DATE: 06/19/2009	SCALE: NOT TO SCALE	DRAWN BY: PAH	DESIGNED BY:
PROJECT NO. 04-3266-603		CHECKED BY:	APPROVED BY:
X	XX/XX/XXXX	XXX	XXX	XXX
REV.	DATE	DESCRIPTIONS	DRAWN BY	CHECKED BY

PROJECT:
Ramsdell Quarry Landfill
Remedial Design

DRAWING TITLE:
CONSTRUCTION DETAILS

CLIENT:
US Army Corps of Engineers
Ravenna Army Ammunition Plant
Ravenna, Ohio

US Army Corps of Engineers® Louisville District

SAIC® From Science to Solutions

C-8
DRAWING NUMBER

Attachment D. Construction Forms and Checklists

RVAAP Ramsdell Quarry Landfill Remedial Action

DAILY CHECKLIST	**DATE:**

Days since last rainfall:_____ Amount of last rainfall: _____Inches

Approximate Temperature: _____ Weather Condition: _____

Completed by: _____

Yes	**No**	**N/A**	
☐	☐	☐	***DAILY TAILGATE SAFETY BRIEFING AND FORM COMPLETED***
			DAILY INSPECTIONS
☐	☐	☐	**SWP3 controls (berms, silt fence, inlet protection, etc.) Morning Inspection:**
			Time Completed:_____
☐	☐	☐	Is standing water present?
☐	☐	☐	Is excavation water present?
			If yes, describe action: _____
☐	☐	☐	Are there structural controls in place? If yes, complete table below.

Type of Control	**Location of Control**	**Condition of Control**	**Sediment Depth (Inches)**

Any Maintenance required: _____

Work to be performed by:_____On or before:_____

General Work Area Inspection:

Time Completed:_____

☐ ☐ ☐ Work area in good shape (e.g., no debris)? If no, describe actions taken.

Intials _____.

DAILY CHECKLIST	**DATE:**

Yes	No	N/A	
☐	☐	☐	Main construction entrance free from soils? If no, describe actions taken.
☐	☐	☐	Is excavation covered nightly and during inclement weather? If no, describe actions taken.
☐	☐	☐	Is spill kit maintained onsite and inspected daily? If no, describe actions taken.
☐	☐	☐	Are fuel tanks stored with secondary containment? If no, describe actions taken.
☐	☐	☐	Is there continuous dust in construction area? If yes, describe actions taken.

Comments/Actions taken: _____

_____

_____

_____

_____

_____

Equipment Inspection

Time Completed: _____

☐	☐	☐	Is Frac Tank near capacity (17,500 gallons)? If yes, describe actions taken.
☐	☐	☐	Is Frac Tank leaking? Is there evidence of wall failure? If yes, describe actions taken.
☐	☐	☐	Are pumps and hoses functioning properly, without leaks? If no, describe actions taken.
☐	☐	☐	Are excavation vehicles operating correctly? If no, describe actions taken.
☐	☐	☐	Are excavation vehicles safety features operation correctly? If no, describe actions taken.
☐	☐	☐	Are orange safety flags visible and clean on excavation equipment? If no, describe actions taken.
☐	☐	☐	Is there any visible leaking fluids (i.e. oil, hydraulic, coolants…)? If yes, describe actions taken.

Comments/Actions taken: _____

_____

_____

_____

_____

_____

☐	☐	☐	Roll-off Boxes
☐	☐	☐	Trucks

☐ ☐ ☐ **Excavation Area Inspection**

Time Completed: _____

Depth of excavation: _____ ft Width of excavation: _____ ft

Length of excavation: _____ ft Soil Type: _____

Intials _____.

DAILY CHECKLIST	**DATE:**

Yes **No** **N/A**

☐ ☐ ☐ Crossing excavation prevented (> ft).
☐ ☐ ☐ Personnel kept away from sidewalls.
☐ ☐ ☐ Equipment and spoils at least two feet from edge.
☐ ☐ ☐ Cave in protection needed.
☐ ☐ ☐ Cave in protection adequate Type of Protection: _____
☐ ☐ ☐ Excavation sloped. If yes, what angle: _____.
☐ ☐ ☐ Water kept out of excavation. If no, describe actions taken.
☐ ☐ ☐ Excavation work WITHOUT entry. If no, contact Project Manager prior to entry for additional controls measures (i.e. safe entry exit, hazardous atmosphere).

☐ ☐ ☐ ***PHOTOGRAPHS TAKEN***

What was photographed	**Number taken (photo log numbers)**

☐ ☐ ☐ ***DAILY MEASUREMENTS OF EXCAVATION AREA***

- o estimated volume/tons _____
- o number of trucks _____

☐ ☐ ☐ ***COMPLETED TRUCK INSPECTION FORMS***

☐ ☐ ☐ ***COORDINATE WITH CONTRACTOR ON NEXT DAY'S EXCAVATION PLAN***
☐ ☐ ☐ Excavation area
☐ ☐ ☐ Number of trucks available
☐ ☐ ☐ Weather forecast

☐ ☐ ☐ ***EXCAVATOR BUCKET WRAPPED IN POLY AND SECURED***

☐ ☐ ☐ ***DAILY COVER (EXCAVATION)***

Intials _____.

DAILY CHECKLIST	**DATE:**

Yes **No** **N/A**

☐ ☐ ☐ ***EQUIPMENT AND SAFETY FENCE SECURED AROUND EXCAVATION AREA***

☐ ☐ ☐ ***LOG BOOK COMPLETED***

☐ ☐ ☐ ***ARE SHIPPING PAPERS/MANIFESTS READY FOR NEXT WORK DAY***

☐ ☐ ☐ ***COMPLETED SWPS INSPECTION AFTER RAIN EVENT DURING WORKING HOURS.***

END OF DAY INSPECTION

☐ ☐ ☐ **SWP3 controls (berms, silt fence, inlet protection, etc.) End of Day Inspection:**

Time Completed:_____

☐ ☐ ☐ Is standing water present?

☐ ☐ ☐ Is excavation water present?

If yes, describe action: _____

_____

_____

☐ ☐ ☐ Are there structural controls in place? If yes, complete table below.

Type of Control	**Location of Control**	**Condition of Control**	**Sediment Depth (Inches)**

Any Maintenance required: _____

_____

_____

_____

Work to be performed by:_____ On or before:_____

QA By:_____

Intials _____.

RVAAP Ramsdell Quarry Landfill Remedial Action

DAILY REPORT		DATE:
Weather Condition	**A.M.**	
	P.M.	
Subcontractors On-Site		
Equipment On-Site		
Visitors On-Site		
Work Performed		
Unexpected Materials Encountered		
Soil Characteristics and Properties		
Schedule Status/Update		
Deviations from Approved Removal Plans and Specifications		
Summary of Communications		
Corrective Action and/or Recommendations for Corrective Action		
Comments		

Completed by: _____ QA by _____

RVAAP Ramsdell Quarry Landfill Remedial Action
Daily Tailgate Safety Brief Log

Date: Conducted by:

I have been briefed by the Site Safety and Health Officer or designated alternate on the potential safety hazards associated the following planned work activities for today:

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____
11 _____
12 _____
13 _____
14 _____
15 _____

Signature: _____ Print Name: _____

Signature: _____ Print Name: _____

Signature: _____ Print Name: _____

Signature: _____ Print Name: _____

Signature: _____ Print Name: _____

Signature: _____ Print Name: _____

Signature: _____ Print Name: _____

Signature: _____ Print Name: _____

Signature: _____ Print Name: _____

Signature: _____ Print Name: _____

Signature: _____ Print Name: _____

Signature: _____ Print Name: _____

SSHO Signature: _____

RVAAP Ramsdell Quarry Landfill Remedial Design
Initial Installation Inspection for Storm Water Controls

Date/Time: _____ Completed by: _____

Initial Installation Inspection for Storm Water Controls

Is the silt fence at least 4 inches to 6 inches into the ground?	Yes ☐ No ☐
Is the trench backfilled to prevent runoff from cutting underneath the silt fence?	Yes ☐ No ☐
Is the silt fence pulled tight so it will not sag when water builds up behind it?	Yes ☐ No ☐
Are the ends brought upslope of the rest of the silt fence so as to prevent runoff from going under the ends?	Yes ☐ No ☐
Is the silt fence on a level contour?	Yes ☐ No ☐
Have all gaps and tears in the silt fence been eliminated?	Yes ☐ No ☐

Maintenance required for above issues:

_____

_____

_____

RVAAP Ramsdell Quarry Landfill Remedial Action
Manifest Log

Disposal Date	Type of Waste	Source/ Location	Date of Generation	Transporter	Truck License No.	Disposal Facility	Waste Profile No.	Manifest Document No.	Facility Quantity (tons)	Copy of manifest leaving site (Y/N)	Signed Manifest Rec'd (Y/N)	Signed Manifest to Regs (Y/N)	Notes

CAMP RAVENNA FIRST RESPONDER REPORTING FORM

(Print all information)

Collect as much of the information on the top half of this form as possible before making initial notification. Complete the top and bottom of the form before turning in to Camp Ravenna.

Name of individual reporting spill: _____

When did the spill occur (Date and Time)? _____

Spill Location (Building or area name / number, indoors or out; if vehicle involved, type and bumper number):
_____

What was spilled? _____ How much was spilled? _____

Rate at which material is currently spilling. _____

Extent of spill travel? _____

Did the spill reach water (ditch, creek, stream, pond, well head) _____

Number of injured personnel and type injuries, if applicable. _____

Do you need the Fire Department to respond to protect life, property, and environment? _____

Unit: _____ State: _____ Report Date & Time: _____

On Scene Coordinator Name and Grade: _____ Phone: _____

How did the spill occur (be specific). _____

_____

What remedial action was taken? _____

_____

Was soil and absorbent material generated? _____ How much? _____

What is the location of the soil and absorbents? _____

Was the Environmental Office contacted (yes or No, date and time)? _____

Who did you talk to in the Environmental Office? _____

Was the site cleared by the Env. Office (Yes or No, date and time)? _____

Who cleared the site (name and grade, date and time)? _____

Initial information is critical. Get as much information as you can, but don't hesitate to make the initial notification if a spill is moving or worsening rapidly!
This form must be completed for all releases and turned-in to Camp Ravenna Range Control within 24 hours.

FIRST RESPONDER SPILL/RELEASE RESPONSE ACTIONS

Units or contractors performing training or other operations at Camp Ravenna shall be responsible for adhering to the provisions identified in the Camp Ravenna Integrated Contingency Plans (ICP). A copy of the ICP may be obtained from the Camp Ravenna Environmental Supervisor. Following discovery of a spill (any size), the procedures outlined below shall be executed where applicable:

1. **If necessary, initiate evacuation of the immediate area.**

2. **Notify Camp Ravenna Range Control via two-way radio or by calling (614) 336-6041 or (614)336-6562, and report information contained on the "First Responder Reporting Form" if it is known or can reasonably be determined. This form has been copied on the opposite side of this page.**

3. **Stop spill flow when possible without undue risk of personal injury.**

4. **If trained, contain the spill using available spill response equipment or techniques.**

5. **Make spill scene OFF LIMITS to unauthorized personnel.**

6. **Restrict all sources of ignition when flammable substances are involved.**

7. **Report to the OSC upon his/her arrival to the scene.**

8. **Turn in a completed copy of the First Responders Form to Camp Ravenna Range Control for ALL releases, even ones cleaned up by the reporter.**

TELEPHONE NUMBER

When Camp Ravenna Range Control is not available, the Camp Ravenna On-Scene Coordinator (OSC) must to be contacted by the discoverer/first responder following a release if it is in water, at or above a reportable quantity (25 gallons or more), a hazardous or extremely hazardous substance, a hazardous waste, or involves fire, explosion, or is otherwise a major incident.

NAME	JOB TITLE	OFFICE	24 HOUR
Camp Ravenna Range Control	Operations and Training	(614)336-6041 or 6562	Contact Alternate
Tim Morgan (Primary OSC)	Environmental Supervisor	(614)336-6568	(330)322-7098
Katie Elgin	Environmental Specialist	(614)336-6136	Contact Alternate
SFC Chad Baucum	Range Operations	(614)336-6562	(330)575-6585
MAJ Richard Saphore	Logistics Officer	(614)336-6790	(614)593-1654
LTC Ed Meade	Garrison Commander	(614)336-6560	(614)307-0493

Off-site (from RTLS area code 614 phones)

Windham Fire Department ……..…9-1-330- 326-2222
Portage County Sheriff ……..… 9-1-330-296-5100
Trumbull County Police, Fire Department and Hazmat…… 911

SEE REVERSE FOR FIRST RESPONDER REPORTING FORM

RVAAP Ramsdell Quarry Landfill
Site and Silt Fence Inspection Form

Date:_____ Time: _____

Weather: (include days since last rainfall and amount in inches of last rainfall)

_____
_____
_____

SILT FENCE INSPECTION

Are silt fences intact? Yes ☐ No☐
If no, describe status when arrived at site and maintenance required for silt fences:

_____
_____
_____
_____
_____
_____

Percentage of grass coverage _____ %

Where photos taken at the site ? Yes ☐ No☐

SITE INSPECTION

Is the site in good shape (e.g., no debris)? Yes ☐ No☐
If no, describe status when arrived at site and maintenance required to improve site condition:

_____
_____
_____
_____
_____
_____

If site requires additional actions beyond what can be done during the inspection, please contact the Project Manager immediately to coordinate site improvements.

ADDITIONAL COMMENTS

_____
_____
_____
_____

Recorded By:_____Date:_____

QC Checked By:_____ Date:_____

RVAAP Ramsdell Quarry Landfill Remedial Action
Visitor Log

I have been briefed on the potential hazards on the work site. I hereby agree to comply with all safety requirements during my visit and will follow the instructions of the Site Safety and Heath Officer.

Print Name	Signature	Agency	Date/Time	Reason for Visit

RVAAP Ramsdell Quarry Landfill Remedial Action
Health and Safety Plan Signature Log

I have reviewed and understand the contents of the Health and Safety Plan. I hereby agree to comply with all the requirements outlined herein.

Signature: _____ Date: _____

Print Name: _____ Agency: _____

Signature: _____ Date: _____

Print Name: _____ Agency: _____

Signature: _____ Date: _____

Print Name: _____ Agency: _____

Signature: _____ Date: _____

Print Name: _____ Agency: _____

Signature: _____ Date: _____

Print Name: _____ Agency: _____

Signature: _____ Date: _____

Print Name: _____ Agency: _____

Signature: _____ Date: _____

Print Name: _____ Agency: _____

Signature: _____ Date: _____

Print Name: _____ Agency: _____

Signature: _____ Date: _____

Print Name: _____ Agency: _____

RVAAP Ramsdell Quarry Landfill
Site Restoration Inspection Form

Date/Time: _____ Completed by: _____

SITE RESTORATION INSPECTION

Final grading completed and vegetative layer installed?	Yes ☐ No ☐ N/A ☐
Temporary SWP3 controls removed?	Yes ☐ No ☐ N/A ☐
Final SWP3 controls installed?	Yes ☐ No ☐ N/A ☐
Were all disturbed areas seeded/hydroseeded?	Yes ☐ No ☐ N/A ☐
Is seed established? (70% coverage is required)	Yes ☐ No ☐ N/A ☐
Is silt fencing intact?	Yes ☐ No ☐ N/A ☐
Are there signs of erosion (cracks/ruts/gullies/minimal grass coverage/slope failure)?	Yes ☐ No ☐ N/A ☐
Are there any areas of the site that are disturbed, but will likely lie dormant for over 21 days?	Yes ☐ No ☐ N/A ☐
Have all dormant, disturbed areas been temporarily stabilized in their entireties?	Yes ☐ No ☐ N/A ☐
Have disturbed areas outside the silt fence been seeded or mulched?	Yes ☐ No ☐ N/A ☐
Have soil stockpiles that will sit for over 21 days been stabilized?	Yes ☐ No ☐ N/A ☐
Has seed or mulch blown away? If so, repair.	Yes ☐ No ☐ N/A ☐

Maintenance required for above issues:

_____
_____
_____

RVAAP Ramsdell Quarry Landfill Remedial Action
Truck Inspection Form

Date/Time:_____ **Completed by:**_____

Truck/License Number:_____ ***Trucking Company***:_____

Type of Load Hazardous Waste Soil or Non-hazardous Waste Soil (circle one)

Is the truck lined (if required by disposal facility)? Yes ☐ No☐

Are all sides of truck and its wheels cleaned of all debris? Yes ☐ No☐
If no, describe actions taken.

_____

_____

_____

_____

Is the truck covered? Yes ☐ No☐

Is waste manifest (or shipping papers) completed and in the truck? Yes ☐ No☐

Comments:

_____

_____

_____

_____

Attachment E

Land Use Controls for Soil and Dry Sediment at the RVAAP-01 Ramsdell Quarry Landfill

Ravenna Army Ammunition Plant,
Ravenna, Ohio

GSA Contract No. GS-10F-0076J
Delivery Order No. W912QR-05-F-0033

Prepared for:
U.S. Army Corps of Engineers
600 Martin Luther King, Jr. Place
Louisville, Kentucky 40202

Prepared by:
Science Applications International Corporation
8866 Commons Boulevard
Twinsburg, Ohio 44087

June 17, 2010

TABLE OF CONTENTS

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
BGS	Below Ground Surface
Camp Ravenna	Camp Ravenna Joint Military Training Center
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chemical of Concern
CUG	Cleanup Goal
FS	Feasibility Study
GIS	Geographic Information System
HHRA	Human Health Risk Assessment
IRP	Installation Restoration Program
LUC	Land Use Control
MEC	Munitions and Explosives of Concern
NGB	National Guard Bureau
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
PMP	Property Management Plan
RAO	Remedial Action Objective
RD	Remedial Design
ROD	Record of Decision
RQL	Ramsdell Quarry Landfill
RVAAP	Ravenna Army Ammunition Plant
RVAAP-01	Ramsdell Quarry Landfill
U.S. Army	U.S. Department of Army
USACE	U.S. Army Corps of Engineers
UXO	Unexploded Ordnance

1.0 BACKGROUND

1.1 GENERAL FACILITY DESCRIPTION

When the Ravenna Army Ammunition Plant (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 21,683.289 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) and subsequently licensed to the OHARNG for use as a military training site Camp Ravenna Join Military Training Center (Camp Ravenna). The current RVAAP consists of 1,280 acres in various parcels throughout the OHARNG Camp Ravenna.

The Camp Ravenna is in northeastern Ohio within Portage County and Trumbull County, approximately 3 miles (4.8 km) east-northeast of the City of Ravenna and approximately 1 mile (1.6 km) northwest of the City of Newton Falls. The RVAAP portions of the property are solely located within Portage County. Camp Ravenna is a parcel of property approximately 11 miles (17.7 km) long and 3.5 miles (5.6 km) 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 (see Figures 1-1 and 1-2). Camp Ravenna is surrounded by several communities: Windham on the north; Garrettsville 6 miles (9.6 km) to the northwest; Newton Falls 1 mile (1.6 km) to the southeast; Charlestown to the southwest; and Wayland 3 miles (4.8 km) to the south.

The entire 21,683-acre parcel was an industrial facility that was government-owned and contractor-operated when the RVAAP was operational (the Camp Ravenna did not exist at that time). The RVAAP IRP encompasses investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP; therefore, references to the RVAAP in this document indicate the historical extent of the RVAAP, which is inclusive of the combined acreages of the current Camp Ravenna and RVAAP, unless otherwise specifically stated.

Camp Ravenna is used for training and related activities; including field operations and bivouac training, convoy training, equipment maintenance, and storage of heavy equipment. Approximately 1,280 acres of property remain under the control of RVAAP; this acreage includes areas of concern (AOCs) and active mission areas. As AOCs are remediated, transfer of the remaining acreage will occur for the purposes of the Camp Ravenna mission. Future uses of the land at RVAAP include mounted and dismounted maneuver training areas, development of ranges, as well as the construction of additional field support and cantonment facilities to support future training.

1.2 RAMSDELL QUARRY LANDFILL DESCRIPTION

The Ramsdell Quarry Landfill (RQL), designated as RVAAP-01, is situated in the northeastern portion of the facility and is 14 acres in size (Figure 1-3). The quarry at RQL occupies approximately 10 acres of the AOC. A seasonally flooded wetland exists in the bottom of the quarry that is sometimes dry for extended periods.

Quarrying activities were conducted at RQL until 1941. During that time, it was excavated 30 to 40 ft (9 to 12 m) below existing grade. The excavated sandstone and quartzite pebble conglomerate was used for road and construction ballast. From 1946 to the 1950s, the bottom of the quarry was used to burn waste explosives from Load Line 1. Reportedly, 18,000 500-lb (225-kg) incendiary or napalm bombs were burned and liquid residues from annealing operations were disposed of in the quarry.

Between 1941 and 1989 the western and southern sections of the abandoned quarry were used for landfill operations. No information is available regarding landfill disposal activities from 1941 to 1976, and no information is available on other activities at the quarry from the 1950s to 1976. Solid waste materials were disposed of in RQL from 1976 until it was closed in 1989. In 1978, a portion of the abandoned quarry was permitted as a sanitary landfill by the State of Ohio. The sanitary landfill was closed in 1990 under State of Ohio solid waste regulations and capped with a clay cover. The cap on the former permitted landfill covers approximately 4 acres along the western and southern portion of the quarry. Five monitoring wells (MW-1 through MW-5) were initially installed for post-closure monitoring of the landfill. These wells were replaced in 1998 and plugged and abandoned in 2006. Semiannual monitoring of groundwater and landfill cap inspections and maintenance are ongoing.

Three investigations have been conducted at RQL:

- *Initial Phase Report, Groundwater Investigation, Ramsdell Quarry Landfill, Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 1999);
- *Final Report on the Groundwater Investigation of the Ramsdell Quarry Landfill, Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2000); and
- *Phase I Remedial Investigation Report for Ramsdell Quarry Landfill (RVAAP-01), Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2005a).

The U.S. Department of Army (U.S. Army) intends to transfer RQL to NGB following the remediation of contaminated soil/dry sediment. OHARNG plans to perform maintenance and inspections of RQL thereby restricting access to the Security Guard/Maintenance Worker.

An evaluation of alternatives was conducted to select remedies for shallow soil and dry sediment. Dry sediment refers to unconsolidated inorganic and organic material on the surface of the ground that occasionally may be covered with water, usually following a precipitation event. Dry sediments are not covered with water for extended periods and typically dry within seven days. Dry sediments do not function as permanent habitat for aquatic organisms although they may serve as a natural

medium for the growth of terrestrial organisms. Dry sediment is essentially soil that due to its location may be covered with water occasionally. The term soil used throughout this land use control (LUC) remedial design (RD) refers to soil and accumulated dry sediment. The evaluation of the alternatives is documented in the *Final Feasibility Study for the Ramsdell Quarry Landfill* (USACE 2006). The selected remedy for chemically contaminated soil consists of excavation and disposal of contaminated soil identified at two locations at RQL. Unexploded ordnance (UXO) and munitions and explosives of concern (MEC) are a concern with any excavation at the RQL (E2M 2008); therefore, MEC survey and clearance procedures are incorporated into all excavation activities at the RQL AOC. The selected alternative includes the following:

- Clearing of vegetation;
- Excavation of contaminated soil above Security Guard/Maintenance Worker cleanup goals (CUGs) to a depth of 1 ft (0.3m) below ground surface (BGS);
- Handling and disposal of contaminated soil (above remedial goals) at an approved off-site facility;
- Confirmatory sampling after excavation;
- Restoration of excavated areas, which could include backfilling with clean fill material per the *Facility Wide Sampling and Analysis Plan for Environmental Investigations at the RVAAP* (USACE 2001) and re-establishing a wetland in disturbed areas;
- Conducting quarterly monitoring of the established wetland for a minimum of 5 years after the remedial action and submitting an annual report to Ohio EPA Division of Surface Water central office (attn: Jeff Boyles), Ohio EPA 401 Coordinator (attn: Ed Wilk), and the Ohio EPA RVAAP Project Manager (attn: Todd Fisher).
- Implementation of LUCs (e.g., security procedures, installation perimeter fencing, markers, and restricted access) at RQL; and
- Conducting 5 year reviews and monitoring of the performance of the selected remedy (i.e., monitoring of the LUC effectiveness) as described in the RQL Final Record of Decision (ROD) (USACE 2009).

In addition, the selected alternative includes inspection and maintenance of the RVAAP and Camp Ravenna perimeter fence.

1.3 PURPOSE

The purpose of this LUC RD is to outline a process for the implementation and maintenance of LUCs as part of the remedial action at RQL. This LUC RD provides LUC performance objectives, the LUCs to be used and the LUC implementation actions.

1.4 EXPOSURE ASSUMPTIONS AND ANTICIPATED LAND USE

This baseline human health risk assessment (HHRA) summary documents the potential health risks to humans resulting from exposure to contamination within RQL at RVAAP if no remedial action was taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. Section G.1 of the ROD summarizes the results of the baseline risk assessment for RQL presented in the Feasibility Study (FS) for RQL (USACE 2006).

RQL is currently managed as "Restricted Access" due to the closed landfill. The landfill is currently under post-closure long-term monitoring and does not require remedial action. RQL is currently closed to all military training activities. Surveying, sampling, and other essential security, safety, natural resources management, and other directed activities may be conducted at RQL only after personnel have been properly briefed on potential hazards/sensitive areas. All individuals unfamiliar with RQL are properly briefed on the hazards/restrictions prior to entry into RQL.

Routinely performed activities at RQL include periodic mowing /maintenance of the landfill cap. In addition, at the completion of the remedial action, the newly established wetland will undergo a five-year monitoring period. Therefore, the most exposed potential human receptor for this land use is the security guard/maintenance worker. It is not anticipated future land uses by OHARNG at this AOC will change due to the constraint of a closed landfill. However the HHRA evaluated the following additional receptors National Guard Dust/Fire Control Worker, National Guard Trainee, Hunter/Trapper, Juvenile and Adult Trespasser, and Resident Subsistence Farmer (adult and child). Risk information for these receptors is included in the HHRA (USACE 2005b), and FS (USACE 2006).

1.5 SUMMARY OF RISKS NECESSITATING LAND USE CONTROLS

Results of the risk assessment for RQL indicate that exposure to surface soil and dry sediment (0 to 1 ft BGS) under current and anticipated future land use scenarios may result in unacceptable risks to human receptors, unless remediation is undertaken to reach established CUGs. The soil chemicals of concern (COCs) for RQL are: arsenic; lead; benz(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; carbazole; chrysene; dibenz(a,h)anthracene; and indeno(1,2,3-cd)pyrene. The response action selected in the ROD is necessary to protect public health, welfare, and the environment from actual or threatened releases of hazardous substances into the environment.

The human health remedial action objective (RAO) for this remedy is to prevent National Guard Security Guard/Maintenance Worker exposure to contaminants in soil and dry sediment that exceed CUGs to a depth of 1 ft BGS.

Soil and dry sediment to be remediated under the ROD extend to a maximum depth of 1 ft BGS because future land use will not require disturbance of soil below that depth. Additionally, bedrock is

very near to the ground surface in much of the quarry bottom. The CUGs for the COCs are presented in Section H, Table 2 of the ROD.

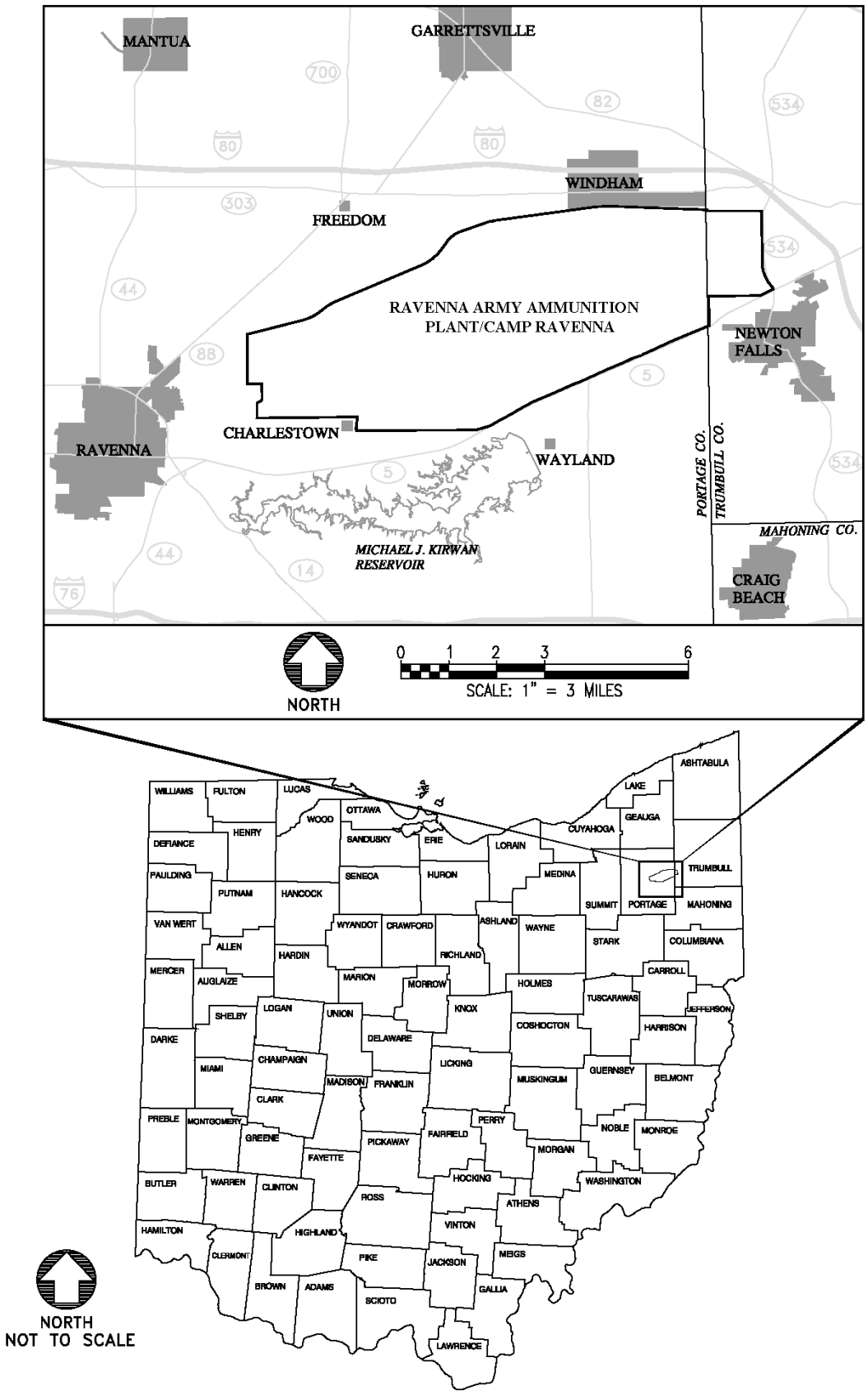
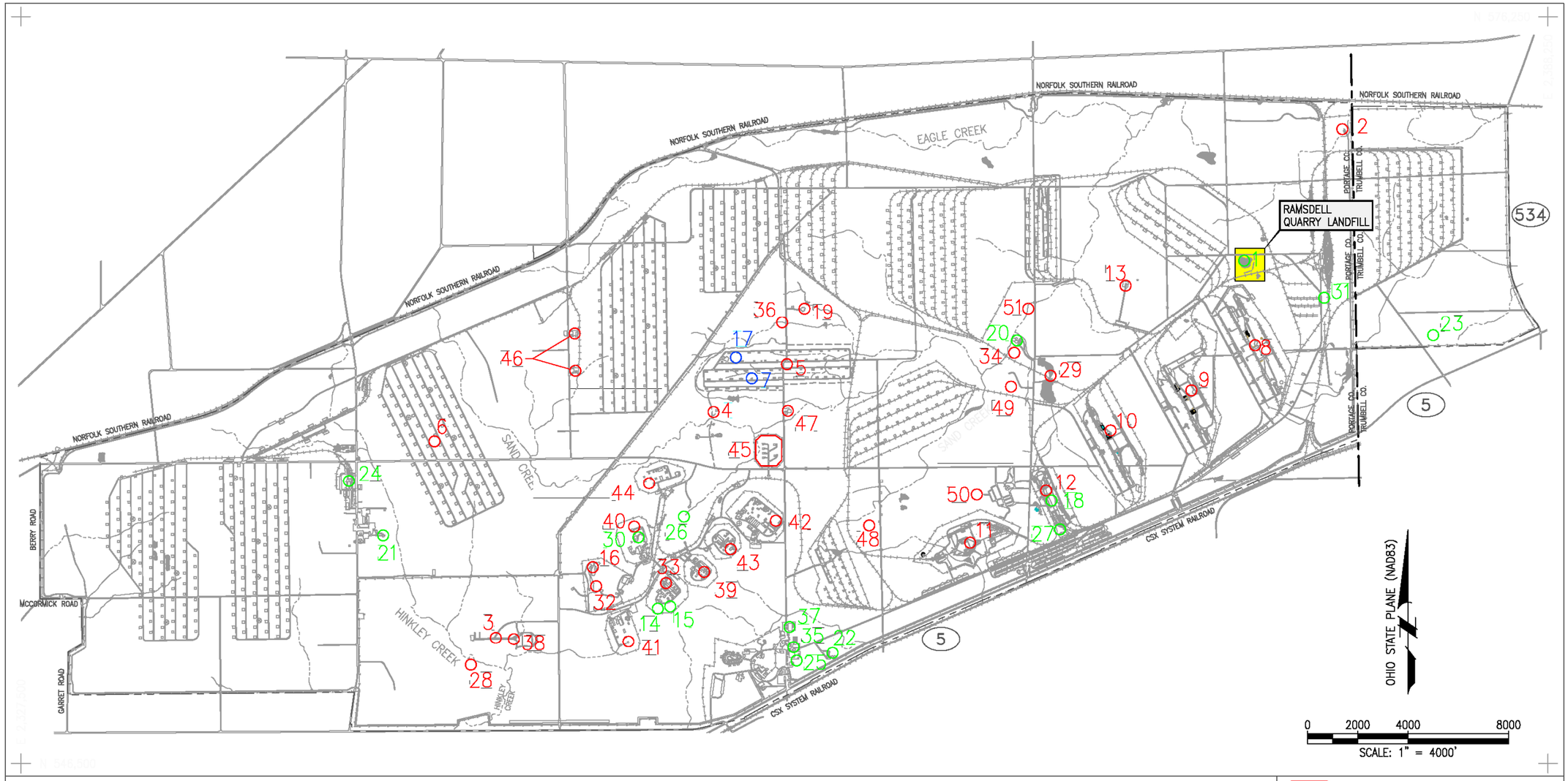


Figure 1-1. General Location and Orientation of the RVAAP/Camp Ravenna



LEGEND:

1. RAMSDELL QUARRY LANDFILL
2. ERIE BURNING GROUNDS
3. DEMOLITIONS AREA #1
4. OPEN DEMOLITIONS AREA #2
5. WINKLEPECK BURNING GROUNDS
6. C BLOCK QUARRY
7. BUILDING 1601 HAZARDOUS WASTE STORAGE
8. LOAD LINE 1 AND DILUTION/SETTLING POND
9. LOAD LINE 2 AND DILUTION/SETTLING POND
10. LOAD LINE 3 AND DILUTION/SETTLING POND
11. LOAD LINE 4 AND DILUTION/SETTLING POND
12. LOAD LINE 12
13. BUILDING 1200 AND DILUTION/SETTLING POND
14. LOAD LINE 6, EVAPORATION UNIT
15. LOAD LINE 6, TREATMENT PLANT
16. FUZE AND BOOSTER QUARRY LANDFILL/PONDS
17. DEACTIVATION FURNACE
18. LOAD LINE 12 PINK WASTEWATER TREATMENT
19. LANDFILL NORTH OF WINKLEPECK BURNING GROUND
20. SAND CREEK SEWAGE TREATMENT PLANT
21. DEPOT SEWAGE TREATMENT PLANT
22. GEORGE ROAD SEWAGE TREATMENT PLANT
23. UNIT TRAINING SITE WASTE OIL TANK
24. RESERVE UNIT MAINTENANCE AREA WASTE OIL TANK
25. BUILDING 1034 MOTOR POOL WASTE OIL TANK
26. FUZE BOOSTER AREA SETTLING TANKS
27. BUILDING 854 PCB STORAGE
28. MUSTARD AGENT BURIAL SITE
29. UPPER AND LOWER COBB'S POND COMPLEX
30. LOAD LINE 7 PINK WASTEWATER TREATMENT PLANT
31. ORE PILE RETENTION POND
32. 40– AND 60–MM FIRING RANGE
33. FIRESTONE TEST FACILITY
34. SAND CREEK DISPOSAL ROAD LANDFILL
35. BUILDING 1037 LAUNDRY WASTEWATER SUMP
36. PISTOL RANGE
37. PESTICIDE STORAGE BUILDING T–4452
38. NACA TEST AREA
39. LOAD LINE 5/FUZE LINE 1
40. LOAD LINE 7/BOOSTER LINE 1
41. LOAD LINE 8/BOOSTER LINE 2
42. LOAD LINE 9/DETONATOR LINE
43. LOAD LINE 10/PERCUSSION ELEMENT
44. LOAD LINE 11/ARTILLERY PRIMER
45. WET STORAGE AREA
46. BUILDINGS F–15 AND F–16
47. BUILDING T–5301 DECONTAMINATION
48. ANCHOR TEST AREA
49. CENTRAL BURN PITS
50. ATLAS SCRAP YARD
51. DUMP ALONG PARIS–WINDHAM ROAD

CERCLA
RCRA
OTHER REGULATORY
RAILROAD TRACKS
FENCE LINE
PROPERTY BOUNDARY
STREAM OR CREEK

US Army Corps of Engineers Louisville District

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE, KENTUCKY

RAVENNA ARMY AMMUNITION PLANT/CAMP RAVENNA

DRAWN BY:	REV. NO./DATE:	CAD FILE:
P.H. / S.D.	REV. 2 / 07–27–04	/00064/DWGS/R73SITE2

File: W:\CAD Gov\Ravenna\PBC 2005\Location Map\RVAAP Site.dwg Layout: Ramsdell User: williamsbe Jun 20, 2007 – 10:04am

Figure 1-2. RVAAP/Camp Ravenna Installation Map

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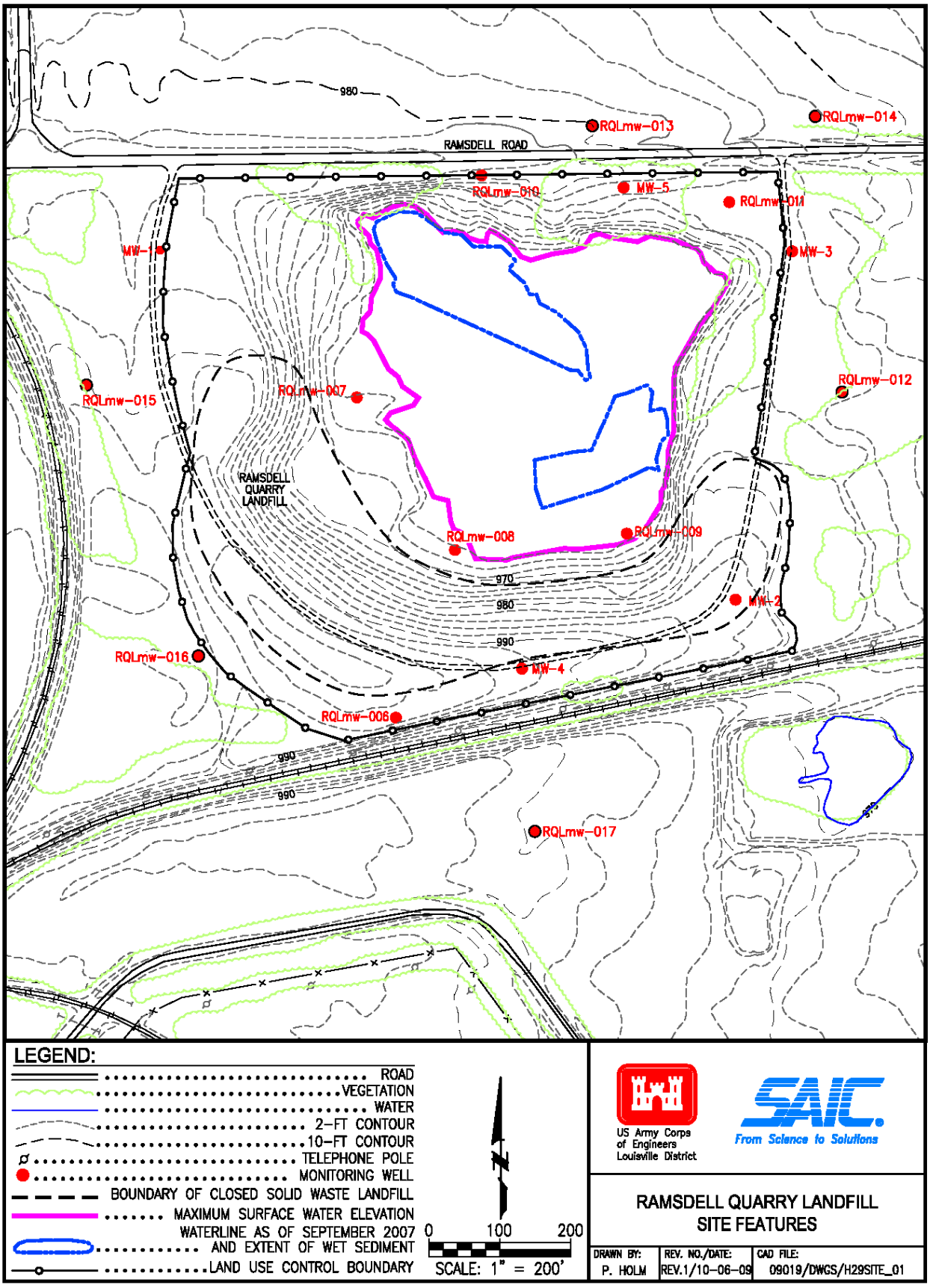

Figure 1-3. Ramsdell Quarry Landfill Area of Concern Map

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2.0 LAND USE CONTROL OBJECTIVES

The U.S. Army will implement LUCs to achieve the performance objectives listed below for RQL.

- Maintain the Camp Ravenna perimeter fence.
- Restrict future land use as "Restricted Access."
- Maintain LUC training program.
- Limit activities to those that are consistent with the Security Guard/Maintenance Worker exposure scenario, such as security, safety, natural resources management, and landfill management activities.
- Conduct wetland monitoring for a minimum of five years after completion of the remedial action.
- Prohibit digging or excavation at RQL within the AOC boundary with the exception of the sanitary landfill. Activities (such as digging or excavation) performed within the post-closure care and maintenance boundary of the sanitary landfill will be governed by Ohio solid waste regulations.

Figure 1-3 depicts the RQL AOC boundary.

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3.0 LAND USE CONTROLS

This section provides a description of the LUCs, the logic for their selection, and implementation actions. The U.S. Army or its representatives are responsible for implementation, inspection, periodic reporting, and enforcement of the LUCs for RQL. As a condition of property transfer or lease, the U.S. Army may require the transferee or lessee, with approval from the Ohio Environmental Protection Agency (Ohio EPA), to assume responsibility for various implementation actions as indicated below. Third party LUC responsibility will be incorporated into pertinent contractual and property documentation, such as a purchase agreement, deed, lease, and an Ohio Environmental Covenant. Although the U.S. Army may transfer primary responsibility for various implementation actions to a third party, the U.S. Army shall remain ultimately responsible for remedy integrity. This means that the U.S. Army remains responsible for addressing violations of LUCs. Should any LUC be violated, the U.S. Army will ensure that appropriate actions are taken as soon as practicable to terminate the offending land use and may initiate legal action to either compel action by a third party(ies) and/or to recover the U.S. Army's costs for remedying any discovered LUC violation(s).

3.1 LAND RESTRICTIONS AT RAMSDELL QUARRY LANDFILL

Land use of RQL shall be limited by the maintenance of the existing Camp Ravenna perimeter fence, which shall be a 6-foot chain-link fence topped with a v-shaped bracket slanting inward and outward with a three-strand barbed wire brack.

Land use shall be limited to use of RQL as required for the maintenance of the closed sanitary landfill. Activities on the RQL shall be limited to the following; maintaining the integrity of monitoring wells and the landfill cap, vegetation management [mowing, brush and weed cutting, controlled burning, and herbicide application]); and compatible natural resources management activities (including but not limited to such activities as flora and fauna surveys, timber management to include timber stand improvement and forest products harvesting, soil stabilization and erosion control, invasive/non-native species control, nuisance wildlife control, drainage maintenance, wetland monitoring and delineations, grassland management, and scientific research).

Duration of exposure shall be based upon the established Security Guard/Maintenance Worker exposure scenario cited per person at 250 days per year at 1 hour per day for a maximum of 25 years (USACE 2005b). All activities must be in compliance with established digging restrictions and established exposure limits. All other uses of RQL are prohibited and the area will be marked with signage, facing outward, to notify personnel.

3.2 DISTURBANCE RESTRICTIONS

All digging or excavation deeper than 1 ft BGS on the RQL AOC is prohibited with the exception of the solid waste landfill cap. Digging and excavation on the landfill cap will be regulated by the post-closure care plan and the Ohio Solid Waste Regulations.

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4.0 IMPLEMENTATION ACTIONS

The U.S. Army shall perform the following implementation actions to ensure that the LUC objectives are met:

- Prepare geographic information system (GIS) data and a map identifying the AOC boundary and the LUC location. Signage/markers will be placed in locations to identify the areas of where the LUC applies.

- Incorporate environmental overlay and appropriate notice procedures into the Property Management Plan (PMP).

- Through the PMP, prohibit all digging or excavation activities, except for: ground surface repairs by authorized personnel in support of landfill cap integrity.

- Through the PMP, maintain the Camp Ravenna perimeter fence; and "restricted access" land use of RQL.

  Through the PMP, implement wetland monitoring requirements for a minimum of five years after the completion of the remedial action. These requirements include:

  1) Weekly monitoring of the site until SWP3 controls are established and 70% coverage is achieved;
  2) Quarterly monitoring of the mitigated wetland once the SWP3 controls are achieved;
  3) Removal of invasive species to ensure that no more that 25% invasive species exist in the re-established wetland;
  4) Submission of an annual report to The U.S. Army will distribute the report to Ohio EPA Division of Surface Water central office (attn: Jeff Boyles), Ohio EPA 401 Coordinator (attn: Ed Wilk), and the Ohio EPA RVAAP Project Manager (attn: Todd Fisher). This annual report will summarize the quarterly monitoring activities.

If additional LUC-related RD documents are identified or prepared for proposed inclusion in the RQL RD, the U.S. Army shall, upon review and approval by the Ohio EPA, incorporate those documents as appropriate into the PMP, and provide copies to Ohio EPA.

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5.0 MODIFICATIONS OR TERMINATION OF LUCS

LUCs concerning disturbance of soil on RQL are expected to remain in place indefinitely. LUCs concerning restriction to Security Guard/Maintenance Worker use are expected to remain in place indefinitely due to the existence of the sanitary landfill.

The U.S. Army shall not, without Ohio EPA approval, make a modification to any LUC. The U.S. Army shall not, without Ohio EPA approval, make a land use change inconsistent with the RQL ROD or this LUC RD. Likewise, the U.S. Army shall seek prior Ohio EPA approval before commencing actions that may impact remedy integrity.

The U.S. Army shall not, without Ohio EPA approval, terminate a LUC. The decision to terminate LUCs will be documented consistent with the National Oil and Hazardous Substances Pollution Contingency Plan process for post-ROD changes.

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6.0 MONITORING AND REPORTING

Periodic monitoring of LUCs in the form of site inspections will be conducted by the U.S. Army to confirm whether the LUCs remain effective and meet LUC objectives for continued remedy protectiveness. Site inspections and wetland monitoring will be conducted as necessary. The site inspections will be performed a minimum of once per year. The wetland monitoring will be performed a minimum of four times per year (quarterly) for a minimum of five years after the remedial action. Site inspections and wetland monitoring events will be performed, when feasible in conjunction with landfill cap inspections required under the post-closure plan. Monitoring results will be reported in an annual LUC monitoring report, with changes in monitoring frequency to be coordinated with and approved by Ohio EPA. The U.S. Army will provide (via mail) each report to Ohio EPA. The U.S. Army will also distribute the report to Ohio EPA Division of Surface Water central office (attn: Jeff Boyles), Ohio EPA 401 Coordinator (attn: Ed Wilk), and the Ohio EPA RVAAP Project Manager (attn: Todd Fisher).

The annual LUC monitoring report will evaluate the status and effectiveness of LUCs with a description of how any LUC deficiencies or inconsistent uses were addressed. The annual LUC monitoring reports will be used in the preparation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 121(c) Five-Year Review. As part of the LUC monitoring report, a written certification will be submitted stating whether or not the LUCs remain in place and are effective.

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7.0 CERCLA 121(C) FIVE-YEAR REVIEWS

As part of the CERCLA Section 121(c) Five-Year remedy review process, the U.S. Army shall prepare a report evaluating the continued effectiveness of the remedy, including effectiveness of the LUCs and an assessment of whether there is a need to modify the LUCs. The U.S. Army will verify whether the LUCs continue to be properly documented and maintained. Each remedy review will evaluate whether conditions have changed due to contaminant attenuation, migration or other factors such as land use. If risk levels have changed since initial LUC implementation, LUC modification will be considered, which may include a change in monitoring frequency.

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8.0 LUC ENFORCEMENT

If the U.S. Army discovers any land use that is inconsistent with the LUC objectives or the LUCs or that impairs the effectiveness of the remedial actions at RQL, the U.S. Army will notify Ohio EPA in writing as soon as practicable but no later than ten (10) days after discovery and include a written description of the inconsistent land use. Within ten (10) days after such notification, the U.S. Army will provide Ohio EPA with information regarding what efforts or measures have or will be taken to address the inconsistent land use.

The U.S. Army will work with Ohio EPA and if applicable, transferees/lessees of RQL or any portion thereof, to take appropriate action to enforce the LUCs or maintain remedy integrity. The U.S. Army may take immediate action pursuant to its CERCLA authorities to prevent any perceived risk(s) to human health or the environment. Any breach of the LUCs will be reported to the appropriate civil authorities. Potential response measures include informal resolution with the owner or violator, and the institution of judicial action under State property law or CERCLA.

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9.0 LEASES AND PROPERTY TRANSFERS

No later than sixty (60) days prior to leasing or transferring any portion of RQL to another agency, person, or entity (including federal to federal transfers), the U.S. Army shall provide written notice to Ohio EPA of such intended lease or transfer. The notice shall identify the proposed lessee or transferee and describe any additional mechanism(s) to be used for future LUC responsibilities after lease or transfer.

As a condition of a lease, the U.S. Army will require that equivalent LUCs will be put into the terms and conditions of the lease. The lease will prohibit the lessee from modification or termination of any restrictions/ LUCs without prior U.S. Army concurrence and Ohio EPA approval.

As a condition of a transfer to another federal entity, the U.S. Army will require that equivalent LUCs will be put into the terms and conditions of the transfer document. The transfer document will prohibit the transferee and subsequent owners or users from modification or termination of the LUCs without prior U.S. Army concurrence and Ohio EPA approval. The U.S. Army will consult with Ohio EPA for input on the deed or transfer document language.

Furthermore, the transferee or lessee will be responsible for ensuring compliance with the LUCs. However, the U.S. Army remains responsible for implementing, maintaining and monitoring the remedial actions (including LUCs) before and after property lease or transfer.

In addition, concurrent with the lease or transfer of RQL or any portion thereof from the U.S. Army, information regarding the LUCs will be communicated in writing to the lessees or transferees and to appropriate state and local agencies to ensure such agencies can factor such conditions into their oversight and decision-making activities regarding the property. Should a problem with LUC implementation, maintenance, monitoring, reporting or enforcement arise at a transferred or leased property, the U.S. Army will work together with the transferee or lessee, and subsequent property owner(s) and user(s), as well as Ohio EPA and appropriate local government representatives, to resolve any LUC problems and to ensure expedient solutions.

If the U.S. Army intends to convey ownership of RQL or any portion thereof to a non-federal entity, the U.S. Army will require that, following review and approval by Ohio EPA, the transferee execute and record an environmental covenant, in accordance with and pursuant to Ohio Revised Code §§ 5301.80 to 5301.92 that establishes the LUCs as enforceable activity and use limitations under state law.

If the U.S. Army becomes aware of an action that interferes with or violates an Environmental Covenant, it will take action to resolve the matter in accordance with the enforcement procedures set forth in the Environmental Covenant. The U.S. Army will notify Ohio EPA within three (3) days of becoming aware of the violation. If the matter is not resolved, the U.S. Army will notify Ohio EPA

of the results of its resolution efforts (e.g., any corrective action) or proposal to resolve the matter within ten (10) days of discovery of the violation.

10.0 RESPONSIBILITIES OF SUBSEQUENT OWNERS/ LESSEES

In the event of property transfer or lease, the U.S. Army may require the transferee or lessee and subsequent property owner(s) and user(s) to assume certain responsibilities for LUC implementation actions described above, including maintenance, inspection, reporting and enforcement, with the involvement of the appropriate state and/or local government representatives. The responsibilities assumed by transferee(s) and subsequent owner(s) and user(s) shall be clearly documented in the appropriate transfer/ lease documentation. The U.S. Army will continue to: (1) conduct all CERCLA 121(c) reviews; (2) notify the appropriate state and/or local government representatives of any known LUC deficiencies or violations; (3) reserve the right to access the property to conduct any necessary response; (4) reserve the authority to change, modify or terminate LUCs and any related deed or lease provisions, with Ohio EPA approval; and, (5) remain responsible for remedy integrity. To the extent permitted by law, a transfer deed shall require the LUCs imposed as part of a CERCLA remedy to run with the land and bind all property owners and users to enforcement by the U.S. Army.

The transferee or lessee, as well as subsequent property owner(s) and user(s), will be responsible for promptly notifying the U.S. Army, Ohio EPA, and local government representatives, of any deficiencies or violations of LUCs and what efforts or measures have or will be taken to address the deficiency within a reasonable time. Any violations of federal, state or local law will be reported to the appropriate law enforcement authorities. If the transferee or lessee wants to (1) conduct additional remediation, (2) change land use inconsistent with a deed or lease restriction, or (3) modify or terminate a LUC, the transferee or lessee must first obtain written approval from the U.S. Army and Ohio EPA and the property owner.

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11.0 REFERENCES

Engineering-Environmental Management, Inc. (E2M) 2008. *Final Site Inspection Report for the Ravenna Army Ammunition Plant, Ohio. Military Munitions Response Program Site Inspection, Munitions Response Sites.* May 2008.

MKM Engineers, Inc. (MKM) 2007. *Characterization of 14 Areas of Concern at Ravenna Army Ammunition Plant, Ravenna, Ohio.* March 2007.

Ohio Environmental Protection Agency (Ohio EPA) 2004. *Director's Final Findings and Orders in the Matter of U.S. Department of the Army, Ravenna Army Ammunitions Plant.* June 2004.

USACE (U.S. Army Corps of Engineers) 1996. *Preliminary Assessment for the Characterization of Areas of Contamination at the Ravenna Army Ammunition Plant, Ravenna, Ohio.* February 1996.

USACE 1998. *Phase I Remedial Investigation Report for the Phase I Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna Ohio*. February 1998.

USACE 1999. *Initial Phase Report, Groundwater Investigation, Ramsdell Quarry Landfill, Ravenna Army Ammunition Plant, Ravenna, Ohio.* January 1999.

USACE 2000. *Final Report on the Groundwater Investigation of the Ramsdell Quarry Landfill, Ravenna Army Ammunition Plant, Ravenna, Ohio.* August 2000.

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

USACE 2005a. *Phase I Remedial Investigation Report for Ramsdell Quarry Landfill (RVAAP-01), Ravenna Army Ammunition Plant, Ravenna, Ohio.* July 2005.

USACE 2005b. *Ravenna Army Ammunition Plant Facility-Wide Human Health Risk Assessor Manual: Amendment 1. November* 2005.

USACE 2006. *Revised Final Feasibility Study for Ramsdell Quarry Landfill (RVAAP-01), Ravenna Army Ammunition Plant, Ravenna, Ohio,* October 2006.

USACE 2009. *Record of Decision for the RVAAP-01 Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio.* March 2009.

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DRAFT REMEDIAL DESIGN FOR THE RVAAP-01 RAMSDELL QUARRY LANDFILL AT THE RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO
REVISEDCOMMENT RESPONSE TABLE
January 11, 2009

Comment Number	Page or Sheet & Line No.	New Page or Sheet	Comment	Recommendation	Response
Ohio EPA - (Todd R. Fisher)					
0-1	Page 10-6, Section 10.5, Transportation, Storage, and Disposal	N/A	There is no mention of truck inspections or requirements that each disposal truck must be covered upon leaving the AOC and/or the Installation.	Please make the appropriate changes to the text.	Clarification. On page 7-3 lines 5-9 state "During the loading process, care will be taken to not overfill the trucks, or spill soil on the sides of the trucks. The haul trucks will be positioned over plastic sheeting to contain any soil spilled during loading. Trucks will be inspected for soil on the exterior of the truck bed. Soil will be brushed off and captured prior to the truck exiting the loading area. Prior to leaving the staging area, all on-road trucks will be covered while en-route to the disposal facility" Recommend no text change.

Comment Number	Page or Sheet & Line No.	New Page or Sheet	Comment	Recommendation	Response
0-2	Attachment A, page 3-1, line 26	Attachment A, page 3-1	The text states that the primary contaminants of concern at RQL are SVOCs. Both lead and arsenic are not included.	Recommend adding lead and arsenic as primary contaminants of concern.	Clarification. Section 2.5 lists lead and arsenic as constituents of potential concern and presents their maximum concentrations detected at RQL. The FS evaluated the exposure point concentrations and determined that arsenic was not a COC at RQL. Lead was considered a COC for the resident farmer with an EPC of 733 mg/kg and average concentration of 303 mg/kg (The CUG for lead is 400 mg/kg). SAIC evaluated the potential lead airborne concentration with the maximum concentration detected at RQL and determined a potential exposure hazard only in the event of visible dust during excavation activities. The text will be revised as follows: "Prior sampling results indicate that the primary contaminants of concern at RQL are SVOCs and lead."
O-3	Attachment A, page 4-1, Table 4-1	N/A	There are several positions in this table where "to be determined" (TBD) are used.	All TBDs should be removed in the final document.	Clarification. The positions identified as TBD are associated with the subcontractor. SAIC has not bid the Remedial Design given the document is not "Final". SAIC will verify the training and credentials prior to field activities. At a minimum, the names will be provided in the Remedial Action Report. Recommend no text change.

Comment Number	Page or Sheet & Line No.	New Page or Sheet	Comment	Recommendation	Response
O-4	Attachment A, page 5-1, Table 5-1	N/A	30 hour OSHA Construction training was offered to contractors in December 2009.	30 hour OSHA Construction training can be added to this table.	Clarification. At this time the 30-hour OSHA Construction training certification is a voluntary program within the State of Ohio and currently RVAAP and USACE Louisville has not mandated the training. The applicable required components of the 30-hour construction safety training for this Remedial Design are covered in the required 40-hr HAZWOPER training (PPE and Health Hazards. At this time, we recommend the 30-hour OSHA Construction training not be listed under Training Requirements. No text change is recommended.
O-5	Drawing Number C-2, Estimated Waste Quantities Box	Drawing Number C-2, Estimated Waste Quantities Box	The boxes under heading "Estimated In Situ Amounts" provide estimates for surface area, volume, and weight for each of the 4 areas/waste streams. However, these estimates are not totaled under each column.	Please provide totals for surface area, volume, and weight.	Agree. SAIC will add an additional line and total each column.
O-6	Drawing Number C-3, Legend	Drawing Number C-3, Legend	The legend shows the Construction Boundary as being a brown line with one long dash followed by one shorter dash. A different line exists on the figure.	Please change the Construction Boundary line in the legend to a brown line with one long dash and two shorter dashes.	Agree. The drawing and legend will be correct to match line types. Drawing C-3 is the only drawing in which the construction boundary is depicted with one long line and two dashes. In order to be consistent with the remaining drawing, the depicted Construction Boundary will be revised to match the legend (one long line followed one dash).

Comment Number	Page or Sheet & Line No.	New Page or Sheet	Comment	Recommendation	Response
O-7	Drawing Number C-4	N/A	The drawing shows the use of #2 stone in the Equipment Storage Area. Will #2 stone be available at the time of construction? It is Ohio EPA's recollection that this #2 stone was not available during FBQ RD (may have been replaced with #4).	Please secure a manufacture to provide #2 stone for this RD.	Clarification. During the FBQ RD, the No 2 stone was available. The Subcontractor had issues procuring the "Rip Rap" (6-8 inch limestone). No revisions recommended.
O-8	Drawing Number C-5, Note 1	Drawing Number C-5, Note 1	The note states that "the contractor shall use caution while excavation near landfill boundary. In the event debris is exposed, construction activities will stop and RVAAP/SAIC will be notified immediately. The Ohio EPA should be notified immediately if such an event occurs.	Please add "Ohio EPA" to the organizations which need to be notified.	Agree. The Note 1will be revised as follows: "….Landfill Boundary. In the event debris is exposed construction activities will stop and RVAAP, SAIC and Ohio EPA will be notified immediately.
O-9	Attachment D, First Responder Spill / Release Response Actions	RD Section 11.6, pg 11-5 Attach B Section 4.6 Pg 4-3	Any spill release to the "Waters of the State" as specified in OAC 6111, or any spill over a "reportable quantity "should be reported to the Ohio EPA spills hotline. 010810 OHARNG Comment: This comment was to include the Ohio EPA spill hotline. That is ok. However, if the spill is on OHARNG property, the contractor is not to call the Ohio EPA if there is a reportable	Please add the Ohio EPA spills hotline	Clarification. This checklist is part of the Camp Ravenna Spill Plan. The text in Section 11.6, Spill Response (page 11-5, lines 4-6) will be revised as follows: The SAIC Construction Manager will ensure the spill is reported to Camp Ravenna Operations and RVAAP Army Staff as well ensure the incident is documented on a Camp Ravenna Spill Incident Reporting Form. The SAIC Construction Manager will also report any spill over a "reportable quantity" to the Ohio EPA Spill Hotline (1-800-282-9378)." The following bullet will be added to the text in

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			quantity. The contractor would call Camp Ravenna in accordance with the spill reporting form and the OHARNG will contact the Ohio EPA if it is a reportable quantity. Mark Patterson can give you guidance on their spill procedures for BRAC property. Please note that in this section (11.6) it indicates that SAIC will report spills in accordance with the Camp Ravenna ICP and report it on the Camp Ravenna First Responder Form. The RA will be performed on BRAC property. Therefore this text should reference the BRAC spill plan. If the spill occurs on Camp Ravenna property, then you would follow our procedures and notify us appropriately. This text needs revised. You may need to distinguish between the BRAC spill procedure and the OHARNG procedure in the text.		Attachment B Section 4.6 Spill Prevention (Page 4-2, Line 43) "6. Report the spill to the Ohio EPA Spill Hotline (1-800-282-9378) if the spill is over a "reportable quantity." Revised response per 010810 OHARNG comment: The text in Section 11.6, Spill Response (page 11-5, lines 4-6) will be revised as follows: "The SAIC Construction Manager will ensure the spill is reported to ~~Camp Ravenna Operations and~~ RVAAP Army Staff and report any spill over a "reportable quantity" (listed on Table 1 of Appendix A to 49 CFR 172.101) to the Ohio EPA Spill Hotline (1-800-282-9378). ~~as well ensure~~ In event the incident occurs on OHARNG property, the SAIC Construction Manager will ensure the spill is reported to Camp Ravenna Operations and documented on a Camp Ravenna Spill Incident Reporting Form. OHARNG will be responsible to contact the Ohio EPA if the spill is over a "reportable quantity"." The following bullet will be added to the text in Attachment B Section 4.6 Spill Prevention (Page 4-2, Line 43) "6. Report the spill to the Ohio EPA Spill Hotline (1-800-282-9378) if the spill is over a "reportable quantity" (listed on Table 1 of Appendix A to 49 Code of Federal Regulation 172.101) and not on OHARNG property."

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0-10	Attachment E, Explosive Safety Submission (ESS)(for final submission)	N/A	The Ohio EPA reviews the Explosive Safety Submission but does not have approval authority.	The Ohio EPA will provide approval for the Final RQL RD, however, the approval letter will state that the Ohio EPA has no approval authority over Attachment E, ESS.	Agree. SAIC acknowledges that Ohio EPA does not have approval authority over Attachment E, ESS.

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OHARNG – Camp Ravenna (Katie Elgin)					
CR-1	Pg 2-2, Line 13	RD pg 1-1 Attach B Pg 2-2	"Implement LUCs" What is meant by this? How will you be implementing LUCs?		Clarification. The referenced text is from the SWPPP and was inadvertently placed in Section 2.0 of the main text. To make amends, Section 2.0 and 3.0 of the main text are placed at the end of this CRT. The text "implement LUCs" is also included in Section 1.1 (page 1-1, line 31) of the RD. The intent of the text was to reference the requirements outlined in Attachment F of the RD not necessarily that SAIC will implement the LUC. The text will be revised as follows: Page 1-1Line 31 of the RD will be deleted. Line 13 on Page 2-2 of the SWPPP will be deleted.

Comment Number	Page or Sheet & Line No.	New Page or Sheet	Comment	Recommendation	Response
CR-2	Pg 2-2, Line 42 and General	RD pg 9-2 Drawing C-7 Notes Drawing C-8 Notes	"The rock construction entrance and stone surface are will not be removed during restoration activities." Please note that if the rock entrance and staging area remain in place, the OHARNG would like to see some smaller stone mixed in with it so that the area is smoother and compacts a little tighter. May require some discussion.		Agree. One four inch lift of No. 57 stone will be applied and graded to the rock construction entrances and stone surfaces. Section 9.2 of the RD will be revised as follows: "The equipment staging area and rock construction entrances at RQL will remain in place, as they will be used in the future by the Army (Attachment C, Drawing C-7). The Subcontractor will apply and grade one four inch lift of No. 57 stone over the existing No. 2 stone during restoration activities." The following note will be added to Drawing C-7: "7. The Subcontractor shall apply and grade one 4-inch lift of No. 57 stone to installed rock areas." The following note will be added to Drawing C-8" "3. One 4-inch lift of No. 57 stone shall be applied and graded to the stone surface area and rock construction entrances during site restoration activities."

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CR-3	Section 5.1 Endangered Species Protection	N/A	Recommend updating this section with information about the submittal and the response from USFWS.		Clarification. Although some of these actions have been completed, our preference would be to treat the actions to notify and obtain permits for specific agencies as "to do" actions in the RD. This will minimize the amount of "real-time" changes that need to be made in the document. Our intention would be to provide the approvals (and any other necessary correspondence) in the Remedial Action Report, as we have done in the past. No text change recommended
CR-4	Section 5.2 Protection of Historic Properties	Section 5.2 Protection of Historic Properties	Again, recommend updating this section with information about the submittal and the response from OHPO. Additionally, last paragraph indicates what to do during an inadvertent discovery of human remains or funerary items. The OHARNG has established a procedure for contractors that should be followed for inadvertent discoveries of human remains. Please also follow this procedure for any other artifacts that may be found. Procedure is attached to comments. 010810 OHARNG Comment: You indicate that no text change updating this section is recommended. Based on the fact that you are making the		See response to CR-3 Page 5-2 lines 10-16 will be revised as follows: "With any ground disturbing activity there is always the potential of an inadvertent discovery of human remains or funerary objects. If such items are encountered during the remedial action, excavation will immediately stop and the OHARNG Cultural Resources Manager (CRM)/Environmental Office, USACE COR, SAIC Project Manager, and RVAAP Facility Manager will be notified. If the CRM is not available, the discovery will be reported to OHARNG Range Control. ~~Standard Operation Procedure #6 in the OHARNG Integrated Cultural Resources Management Plan (ICRMP) will be implemented.~~ The CRM or Range Control will collect or secure any artifacts or remains identified for analysis or curation, as appropriate. Human remains are not to be disturbed or removed. Excavation activities will not resume until the OHARNG Standard Operation Procedures for

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			determination and OHPO has not concurred yet with this determination (for text in this report), I recommend that you setup the text in this section similar to the USFWS/Endangered Species section. That way you are not making the determination (as it currently sounds in the text) but allowing OHPO the time to make the determination. I am suggesting that you replace the first 2 paragraphs in this section (5.2) with the following text: "RQL is considered highly disturbed by past construction activity. However, the Ohio Historic Preservation Office (OHPO) will be informed of the remedial activities prior to mobilization. The notification will state the implementation of this RD will have no effect on historic properties. The OHPO must concur with this determination prior to any implementation."		inadvertent discovery of cultural material is completed and the site has been released by the OHARNG ~~Cultural Resources Manager~~." Revised response per 010819 OHARNG comment: Agree. Section 5.2 will be replaced with the following text. "RQL is considered highly disturbed by past construction activity. ~~The disturbance in such areas is considered so great that any historic properties, if present, would have been destroyed or disturbed to the degree that they have lost historic integrity and have no value as historic properties. The Area of Potential Effect (APE) for the remediation activities consists of the quarry bottom, and is within the previously disturbed area.~~ ~~Based on the past disturbance history of the APE, it is has been determined that there is no potential for the remedial action to impact historic properties. A letter outlining the remedial action and the determination of no affect on historic properties will be sent to~~ However, the Ohio Historic Preservation Office (OHPO) ~~for their review and concurrence. Implementation~~ will be informed of the remedial acti~~on~~vities prior to mobilization. The notification will state the implementation of this RD will have no effect on historic properties. ~~will not take place until t~~The OHPO ~~has reviewed and concurred with the determination~~ must concur with this determination prior to any implementation. With any ground disturbing activity there is always the potential of an inadvertent discovery of human remains or funerary objects. If such items are

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					encountered during the remedial action, excavation will immediately stop and the OHARNG Cultural Resources Manager (CRM)/Environmental Office, USACE COR, SAIC Project Manager, and RVAAP Facility Manager will be notified. If the CRM is not available, the discovery will be reported to OHARNG Range Control. ~~Standard Operation Procedure #6 in the OHARNG Integrated Cultural Resources Management Plan (ICRMP) will be implemented.~~ The CRM or Range Control will collect or secure any artifacts or remains identified for analysis or curation, as appropriate. Human remains are not to be disturbed or removed. Excavation activities will not resume until the OHARNG Standard Operation Procedures for inadvertent discovery of cultural material is completed and the site has been released by the OHARNG C~~ultural~~ Resources ~~Manager~~." Additionally, "CRM" will be added to the list of acronyms and abbreviations.
CR-5	Pg 6-5, Line 22	Pg 6-5	"Prior to soil remedial activities, the subcontractor will pump the quarry bottom to the wooded areas on the outside of the landfill but within the AOC." There is not much wooded area within the AOC where the water is proposed to be pumped. My guess, based on topography too, is that the water will run off the AOC area into adjacent areas. I think your logic of keeping the water on the AOC		Agree. The text will be revised as follows: "Prior to soil remedial activities, the Subcontractor will pump the quarry water from the quarry bottom to the wooded areas on the outside of the landfill~~,~~ ~~but within the AOC. The Phase I RI (USACE 2005) indicated the surface water at the bottom of RQL has no COCs for the Security Guard Maintenance Worker and National Guard Trainee. Therefore, it is assumed that removal of the water from the quarry bottom will not impact discharging areas.~~ The Subcontractor will use a sediment bag to minimize

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			is incorrect here.		sedimentation build up at the receiving areas. The pumping will be conducted so that no significant ponding or flooding occurs in the receiving areas. As needed, the pump hoses will be moved if a receiving area gets too saturated."
CR-6	Attachment A, Pg 13-1, Emergency Phone Numbers	Attachment A, Pg 13-1	Although RQL is BRAC property, you will still be accessing and utilizing OHARNG property. Please add OHARNG Range Control to the emergency list at (614)336-6041. You should also add Camp Ravenna Garrison Commander at (614)336-6560.		Agree. Table 13-1 will be updated as recommend to include Camp Ravenna Range Control and Garrison Commander

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CR-7	Attachment B, SWPPP	RD Pg 5-1 Pg 5-3	Will this plan be submitted to Portage County Soil and Water Conservation District?		Clarification. SAIC contacted Mr. James Bierlair of the Portage County Soil and Water Conservation District and submitted an electronic version of the draft remedial design for his review on 12/23/09, as part of the new requirement (effective 1/1/10) established in the Portage County Construction Site Sediment, Erosion, and Storm Water Management Rules. The text in Section 5.0 Permit Notification Requirements will revised as follows: On page 5-1 the following bullet will be added after line 8: • Submittal and approval of the SWP3 (Attachment B) to the Portage County Soil and Water Conservation District; On page 5-3 the following section will be added to the text. "5.4 Portage County Requirements As required in the Portage County Construction Site Sediment, Erosion, and Storm Water Management Rules, SAIC will submit the site-specific SWP3 to the Portage County Soil and Water Conservation District for review. If required upon review by the Portage County Soil and Water Conservation District, five copies of the SWP3 and the Portage County Soil and Water Conservation Districts letter/report will be submitted to the Portage County Board of Commissioners for approval (in the event the project does not qualify for a waiver)."

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CR-8	Attachment B, Pg 2-3, Section 2.5 Receiving Stream	Attachment B, Pg 2-3, Section 2.5 Receiving Stream	Here you are indicating that all construction storm water shall be collected in a temporary storage tank and there will be no runoff to a receiving stream. What about the water that is discharged from the quarry prior to the remediation activities? It may go to a receiving stream. Should that be mentioned here?		Agree. Text will be revised as follows: "The wetland area is seasonally flooded and isolated (no surface water drainage to another body of water). Prior to soil remedial (construction activities), the water from the bottom of the quarry will be pumped to wooded areas outside of the landfill, as necessary. During construction activities: 1) water that is connected to excavated (contaminated) areas will be considered "Excavation Water" and will be managed in accordance with Table 10-1 of the RD. 2) any water that accumulates during construction activities but is not connected to excavated (contaminated) areas may also be pumped to the wooded areas outside of the landfill. For water that is pumped to the wooded areas, a sediment bag will be used to minimize sedimentation build up at the receiving areas. The pumping will be conducted so that no significant ponding or flooding occurs in the receiving areas. Clearing of riparian areas, vegetation, and trees shall be minimized during remedial activities. Sediment and erosion controls shall be installed prior to earth disturbing activities to minimize impacts to wetlands areas not requiring soil removal. Construction site storm water associated with disturbed areas shall be collected in a temporary storage tank for characterization and proper disposal."

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CR-9	Attachment B, Section 4.6, Spill Prevention	Attachment B, Section 4.6, Spill Prevention	Although RQL is BRAC property, you will be also accessing and utilizing OHARNG property. Please reference the OHARNG Camp Ravenna spill procedures in the text. I see that you provided the spill form in Attachment D which is good. 010809 OHARNG Comment: SAIC suggested text: "and the OHARNG First Responder Spill/Release Response Action Checklist" You need to reference the OHARNG spill plan not the reporting form. Change to "and the OHARNG Spill Contingency Plan (if the spill is on OHARNG property)".		Clarification. The OHARNG Camp Ravenna Spill Plan is referenced in Section 11.6 of the RD, as well as on Page 4-2 lines 41-42 of the SWPPP which states "Complete necessary paperwork as required by the RVAAP ISCP and OHARNG Camp Ravenna Spill Plan." The text will be revised on page 4-2, lines 25-27 as follows: "Spill cleanup procedures outlined in Section 12.1.2 of the Facility-Wide Safety and Health Plan (FWSHP) (USACE 2001), ~~and~~ pages 10 through 15 of the Installation Spill Contingency Plan (ISCP) (PIKA 2009) and the OHARNG First Responder Spill/Release Response Action Checklist shall be understood by employees, contractors, and the Subcontractor. Revised response per 010819 OHARNG comment: Agree. The text will be revised as recommended on page 4-2, lines 25-27 as follows: "Spill cleanup procedures outlined in Section 12.1.2 of the Facility-Wide Safety and Health Plan (FWSHP) (USACE 2001), ~~and~~ pages 10 through 15 of the Installation Spill Contingency Plan (ISCP) (PIKA 2009) and the OHARNG Spill Contingency Plan (if the spill is on OHARNG property) shall be understood by employees, contractors, and the Subcontractor.
CR-10	General	Drawing C-6	Change 'Show Road' to "Snow Road" on plans and documents. (ex. Drawing C-6)		Agree. Drawing C-6 will revised as recommended.

Change to clarify use of absorbent material:

During the implementation of the FBQ RD, excavated sediments were saturated and saw dust was mixed with the sediments to reduce the moisture content of the material. The following text will be inserted in Section 7.3.2, page 7-3 after line 4.

"…….disposal facility.

In the event excavated soils are saturated and a potential exists for water to leak or drip during the removal and transportation soil; the Subcontractor shall apply and mix an absorbent material (such as, saw dust, woodchips) to the soil within the limits of the excavation. The Subcontractor will ensure that an adequate amount of absorbent material is mixed to ensure free water is not present in the haul truck and there are no liquids escaping the truck bed. The Subcontractor will not use any absorbent material that could potentially change the chemical profile of the contaminated soil."

Changes as a result of ROD signature:

Page 1-7, line 2 will be revised as follows:
"…… RQL ROD on May 8, 2009 and was ~~is pending~~ sign~~ature~~d by the Director of the Ohio EPA on October 13, 2009."

Attachment B, Page 3-6, lines 15-16 will be deleted.

Organizational Chart Change:

Organizational Chart on Page 2-5 will be revised to reflect Jed Thomas as the Project Manager and Rich Sprinzl as the SAIC Technical Manager.