APPENDIX E

PROJECT QUALITY ASSURANCE SUMMARY

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CONTENTS

ACRONYMS

CQC	contractor quality control
EPA	U. S. Environmental Protection Agency
FCO	field change order
GPL	GPL Laboratories, Inc.
M&TE	materials and testing equipment
NCR	Nonconformance Report
QA	quality assurance
QC	quality control
RI	remedial investigation
RVAAP	Ravenna Army Ammunition Plant
SAIC	Science Applications International Corporation
SAP	sampling and analysis plan
SOW	Statement of Work
USACE	U. S. Army Corps of Engineers

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E. PROJECT QUALITY CONTROL SUMMARY REPORT

This appendix presents the actions and methodologies undertaken to meet the quality assurance/quality control (QA/QC) goals for the Phase I remedial investigation (RI) at Ramsdell Quarry at the Ravenna Army Ammunition Plant (RVAAP). These goals were established in the *Facility-wide Sampling and Analysis Plan (SAP) for the Ravenna Army Ammunition Plant* (USACE 2001a) and the *Sampling and Analysis Plan Addendum No. 1 for the Phase I Remedial Investigation of Ramsdell Quarry Landfill* (USACE 2003). The field investigation was conducted under one mobilization; this appendix addresses QA/QC goals for the entire project. These goals were implemented through project-specific procedures and requirements, the Science Applications International Corporation (SAIC) QA Program, and the U. S. Army Corps of Engineers (USACE), Louisville District QA requirements. A large portion of project QA was focused on field and analytical laboratory activities and project administration.

E.1 FIELD QUALITY ASSURANCE

E.1.1 Readiness Review

Field QA was initiated for the Ramsdell Quarry Phase I RI in the readiness review held at the SAIC Oak Ridge office on October 17, 2003. The purpose of the readiness review was to ensure that

- project documents and procedures were approved, controlled, and properly distributed;
- assigned personnel were trained or a schedule was established to conduct training;
- mobilization and site logistics were established;
- laboratories were ready to accept samples;
- subcontractors were ready to begin work; and
- QA systems were implemented.

All elements of the readiness review were completed prior to initiating field activities and were approved by the SAIC QA/QC Officer. Readiness review and project kickoff checklists provide documentation of this QA element and are maintained in the project file.

E.1.2 Procedures

Standard operating methods for field activities performed during the Ramsdell Quarry Phase I RI are incorporated into the governing documents for the project. The facility-wide sampling and analysis plan (SAP) (USACE 2001a) describes the overall approach and methodologies to be used for projects at RVAAP, and the *Phase I RI SAP Addendum* (USACE 2003) details project-specific requirements for field implementation. These documents were reviewed by USACE, Louisville District and by the Ohio Environmental Protection Agency prior to implementation. Clarifications and/or planned deviations from these methods were documented as field change orders (FCOs), and variances were documented as Nonconformance Reports (NCRs). Copies of the FCOs issued during the Phase I RI are attached to this appendix.

E.1.3 Training

Field team personnel were trained in all procedures applicable to their assigned tasks. Training was accomplished through a combination of classroom lectures, reading assignments, and on-the-job training. Surveillance performed by the project SAIC contractor quality control (CQC) representative provided assessments of worker proficiency and training effectiveness.

Training was documented by the completion of training records. The CQC representative completed performance documentation in the field after observing successful implementation of a procedure by a field team member. Copies of training records and surveillance reports were maintained in the project file. Copies of training records required for Occupational Safety and Health Administration and U. S. Department of Transportation compliance also were maintained in the field.

E.1.4 Equipment Calibration

Various types of measuring and testing equipment (M&TE) were used during the field investigation. All M&TE was categorized, assigned unique identifiers, and listed in an inventory in the M&TE logbook. Last and next calibration recall dates were also recorded. As appropriate, instruments were calibrated daily according to the manufacturer's instructions. Only equipment and standards having verifiable traceability to nationally recognized standards were used for calibration. Daily calibration activities and results were recorded in the M&TE logbook, as well as source information for all calibration standards and reagents.

E.1.5 Quality Control Samples

Field QC samples collected included trip blanks, equipment rinsate blanks, source water, and field duplicates. Field QA splits were collected as specified in the *Phase I RI SAP Addendum* (USACE 2003) pertaining to CQC. Implementation of the CQC program in the field was done by the SAIC CQC representative. Appendix F presents an evaluation of data quality and analytical performance with respect to field QC results. Field QC data and analyses of QC samples are presented in Appendix G.

E.1.6 Field Records

Field data, observations, activities, and information were recorded in pre-formatted, bound field logbooks, with the exception of hydraulic conductivity tests (slug tests). The use of structured logbooks ensured that all necessary data were entered consistently. Logbook entries were checked for accuracy and completeness by independent reviewers. Critical and/or contract-required original records (e.g., sampling forms) were recorded in duplicate using carbonless paper. Other field records, which were collected and likewise maintained, included equipment/material certifications, boring logs, and air-bill forms. Slug test data were collected using automated data loggers and computers utilizing commercial software packages to store and analyze these types of data (WinSitu™ and AqteSolve™).

E.2 ANALYTICAL LABORATORY QUALITY ASSURANCE

SAIC subcontracted GPL Laboratories, Inc. (GPL) to perform chemical analysis of samples collected during the Phase I RI. The selected laboratory is certified by the USACE, Missouri River Division, Mandatory Center of Expertise in Omaha, Nebraska. In addition, this laboratory was technically audited by SAIC prior to contract award. QA split samples were collected and submitted to an independent USACE QA laboratory, Severn Trent Laboratories, Inc., located in North Canton, Ohio.

E.2.1 Readiness Review

Laboratory QA/QC activities were initiated during the readiness review. The readiness review ensured that (1) governing documents and approved analytical methods were controlled and properly distributed, (2) the laboratory was scheduled and ready to conduct the analysis, (3) logistical coordination was established between the laboratory and the field team, and (4) laboratory QA programs were consistent and compatible with the project requirements.

E.2.2 Procedures

Prior to initiation of analytical support for the Phase I RI, GPL and SAIC reviewed and negotiated a contract based on a comprehensive laboratory Statement of Work (SOW). The laboratory SOW detailed project-specific requirements, including the parameters to be measured, analytical methods, adherence to U. S. Environmental Protection Agency (EPA) SW-846 protocols, project quantitation goals (sensitivity), and data deliverables requirements. All laboratory comments and questions were resolved before analytical work proceeded.

E.2.3 Laboratory Quality Control

To document laboratory data quality and to measure the quality of the analytical process, laboratory QC samples and data verification/validation were employed. The results of laboratory QC are discussed in the project QC Summary Report (Appendix F). Analytical results of laboratory QC samples are included in the project file and form the basis of the data verification and evaluation process (Section E.2.5).

E.2.4 Laboratory Documentation

GPL maintains comprehensive information regarding the entire analytical process. The laboratory delivered summary data packages and electronic deliverables consistent with those identified in the EPA SW-846 protocol to SAIC for validation and verification. Laboratory QC sample analyses were cross-referenced to the appropriate environmental field sample analyses in the laboratory deliverables.

E.2.5 Data Verification/Validation

Analytical data generated during this project were subjected to a rigorous process of data verification by SAIC. For verification of data, criteria were established against which the analytical results were compared and from which a judgment was rendered regarding the acceptability and qualification of the data (Appendix H). Upon receipt of data packages from each laboratory, the information was subjected to a systematic examination following standardized checklists and procedures to ensure content, presentation, administrative validity, and technical validity. Routine data changes were documented through data change forms. Data deficiencies or formal laboratory-related nonconformances were documented through an NCR process, as required.

E.3 QUALITY ASSURANCE DOCUMENTATION

Primary methods for documenting QA during the Ramsdell Quarry Phase I RI include the completion of FCOs requiring USACE concurrence and NCRs generated in accordance with SAIC QA procedures. Copies of FCOs completed during the investigation are included in this appendix. Copies of NCRs are on record in the SAIC RVAAP project file.

E.3.1 Field Change Control

The FCOs were completed during the RI to request and document the rationale and approval for any departures from protocols specified in the approved Facility-wide SAP and the Ramsdell Quarry Phase I RI SAP Addendum. Field changes provide clarification to the scope or refinement in the procedural approach to a specific field activity. All FCOs were reviewed and approved by designated technical representatives of USACE, Louisville District prior to implementation. None of the FCOs resulted in an

adverse impact to project quality, schedule, or scope. Copies of the approved FCOs are included in this appendix. The following two (2) FCOs were implemented during the Phase I RI activities:

- FCO No. 001 documented the volume reduction from five to three well volumes during the development of RQLmw-016 and RWLmw-017 due to slow recharge, and

- FCO No. 002 documented the reduction of protective casing at RQLmw-013 from 8 to 7 ft to make the stick up approximately 3 ft above ground surface instead of 4 ft above ground surface.

E.3.2 Nonconformance Reports

To identify and correct conditions adverse to quality, as described in the field and laboratory QA plans, NCRs and associated corrective action reports were completed, as necessary. No NCRs were identified throughout the duration of the project.

E.4 REFERENCES

USACE (U. S. Army Corps of Engineers) 2001a. *Facility-wide Sampling and Analysis Plan (SAP) for the Ravenna Army Ammunition Plant, Ravenna, Ohio,* DACA62-00-D-0001, DO CY 02, March.

USACE (U. S. Army Corps of Engineers) 2003. *Sampling and Analysis Plan Addendum No. 1 for Phase I Remedial Investigation of Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio*, F44650-99-D-0007, ECAS 186, October.

FIELD CHANGE ORDERS

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FIELD CHANGE REQUEST

Field Charge No: 001 Page of 1 of 1

Project Number: 01-1622-04-6771/01-1622-04-1754

Project Name: Ravenna Phase II RI EBG/Phase I RI RQL

Change Request

Applicable Reference SSHP

Description of Change: Currently the SSHP states that all onsite personnel will have current training in OHSA HAZWOPER. This FCR is to document an exclusion of this requirement for the land surveyors. Surveyors will be exempt from the OSHA training and medical surveillance during this work.

Reason for Change: 1. Surveyors will be onsite less than 30 days (2-3 days at RQL, 3-4 days at EBG).

2. Surveyors will not be conducting environmental sampling or waste management activities. Surveyors will not be conduction any activities involving disturbance of potentially contaminated materials.

3. At EBG, previous EPA Region 9 industrial PRG screening (at a risk level of 10-7) of surface soil identified no volatile organic constituents as COPCs. Only 2,4,6-TNT, two SVOCs, and eight metals were identified as COPCs in soil. Because the site is heavily vegetated, soil moisture content is currently high, and no intrusive activities will be performed by surveyors, there is negligible risk that airborne concentrations of identified COPCs would exceed any applicable PELs.

4. At RQL, previous EPA Region 9 industrial PRG screening (at a risk level of 10-7) of sediment collected from the bottom of the quarry identified no volatile organic constituents as COPCs. Only 3 metals were identified as COPCs in sediment. Because the site is heavily vegetated, soil moisture content is currently high, and no intrusive activities will be performed by surveyors, there is negligible risk that airborne concentrations of identified COPCs would exceed any applicable PELs.

Impact on Present and Completed Work: None

Requested by: Martha Clough (SAIC SSHO) Date: 10/24/03

Acknowledged by: N/A (Subcontractor Representative/Company Name) Date: N/A

Field Operations Manager Recommendation

Recommended Disposition:

Recommended by: (SAIC Field Operations Manager) Date:

Health and Safety Review

Approved/Disapproved by: (SAIC Qualified Individual) Date: 10/24/03

Project Manager Review

Final Disposition:

Approved/Disapproved by: W. Kent Ford (SAIC Project Manager) Date: 10-24-03

Field Change Order (FCO)

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FCO NO 002

MODIFICATION NO. _____ DATE 10/29/03 WORK AUTHORIZATION _____

TYPE OF CHANGE _____ PRIORITY O EMERGENCY O URGENT ☒ ROUTINE

ADS NO. _____ CYWP NO. _____ CWBS NO. _____ ☒ MINOR O MAJOR O OTHER

REQUESTER IDENTIFICATION

NAME Martha Clough ORGANIZATION SAIC PHONE 330·405·5804

TITLE FOM SIGNATURE Martha Clough

BASELINE IDENTIFICATION

BASELINE(S) AFFECTED O COST O SCOPE O MILESTONES ☒ METHOD OF ACCOMPLISHMENT

PROGRAM SERVICE ORDER NO. _____ REVISION NO. _____ CAM SIGNATURE _____

PHONE _____

DESCRIPTION OF CHANGE

Number of boreholes to have rock coring at Ramsdell Quarry Landfill reduced from all six locations to 3 locations - RQLmw-012, RQLmw-015, and RQLmw-017

JUSTIFICATION

Sufficient rock core samples have been obtained from this AOC, and with concurrence from OEPA reducing locations to be cored by half. Following new OEPA guidance. Site is adequately characterized with 3 locations - adequate stratagraphic represented.

IMPACT OF NOT IMPLEMENTING REQUEST

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST

COST ESTIMATE $ _____ ESTIMATOR SIGNATURE _____

PHONE _____ DATE _____

PREVIOUS FC AFFECTED O YES ☒ NO

APPROVAL CLIENT PROJECT MANAGER SIGNATURE P.L. Zeller El 1 Mgr 11/18/03 DATE 29 OCT 03

QAS REVIEW _____ DATE _____

TIME FROM INITIATION TO ACTION _____

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Field Change Order (FCO)

FCO NO 003

MODIFICATION NO. _____ DATE 11/6/03 WORK AUTHORIZATION _____

TYPE OF CHANGE _____ PRIORITY O EMERGENCY O URGENT ☒ ROUTINE

ADS NO. _____ CYWP NO. _____ CWBS NO. _____ ☒ MINOR O MAJOR O OTHER

REQUESTER IDENTIFICATION

NAME Martha Clough ORGANIZATION SAIC PHONE 330·405·5804

TITLE FOM SIGNATURE Martha Clough

BASELINE IDENTIFICATION

BASELINE(S) AFFECTED O COST O SCOPE O MILESTONES ☒ METHOD OF ACCOMPLISHMENT

PROGRAM SERVICE ORDER NO. _____ REVISION NO. _____ CAM SIGNATURE _____

PHONE _____

DESCRIPTION OF CHANGE

Protective casing at RQL mw #13 reduced from 8 feet to 7 feet.

JUSTIFICATION

One foot of protective casing was cut to allow the casing to be ~ 3 ft above ground surface.

IMPACT OF NOT IMPLEMENTING REQUEST

Protective casing would have been at four feet above ground surface

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST

COST ESTIMATE $ _____ ESTIMATOR SIGNATURE _____

PHONE _____ DATE _____

PREVIOUS FC AFFECTED O YES ☒ NO

APPROVAL CLIENT PROJECT MANAGER SIGNATURE P.L. Zdunek DATE 06 NOV 03

QAS REVIEW _____ DATE _____

TIME FROM INITIATION TO ACTION _____

Field Change Order (FCO)

FCO NO 004

MODIFICATION NO. _____ DATE 11/19/03 WORK AUTHORIZATION _____

TYPE OF CHANGE _____ PRIORITY O EMERGENCY O URGENT ⊗ ROUTINE

ADS NO. _____ CYWP NO. _____ CWBS NO. _____ ⊗ MINOR O MAJOR O OTHER

REQUESTER IDENTIFICATION

NAME Martha Clough ORGANIZATION SAIC PHONE 330-405-5804

TITLE FOM SIGNATURE Martha Clough

BASELINE IDENTIFICATION

BASELINE(S) AFFECTED O COST O SCOPE O MILESTONES ⊗ METHOD OF ACCOMPLISHMENT

PROGRAM SERVICE ORDER NO. _____ REVISION NO. _____ CAM SIGNATURE _____

PHONE _____

DESCRIPTION OF CHANGE

RQLmw-016 and RQLmw-017 minimum volume required for well development reduced from 5 well volumes to 3 well volumes.

JUSTIFICATION

RQLmw-016 and RQLmw-017 are slow recharging. Wells are able to be bailed dry.

IMPACT OF NOT IMPLEMENTING REQUEST

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST

COST ESTIMATE $ _____ ESTIMATOR SIGNATURE _____

PHONE _____ DATE _____

PREVIOUS FC AFFECTED O YES ⊗ NO

APPROVAL CLIENT PROJECT MANAGER SIGNATURE P. L. Zahn DATE 19NOV03

QAS REVIEW _____ DATE _____

TIME FROM INITIATION TO ACTION _____