APPENDIX F

Investigation-Derived Waste Management Reports

Appendix F-1. Characterization and Disposal Letter Report for Soil Cuttings and Decontamination Fluids
Appendix F-2. Ohio EPA Approval of Waste Characterization

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Appendix F-1. Characterization and Disposal Letter Report for Soil Cuttings and Decontamination Fluids

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SAIC Engineering of Ohio, Inc.
A subsidiary of Science Applications International Corporation

May 25, 2010

Mr. Mark Nichter
U.S. Army Corps of Engineers, Louisville District
ATTN: CELRL-PM-P-E
600 Martin Luther King, Jr. Place
Louisville, Kentucky 40202-0059

Reference: **Contract No. W912QR-04-D-0028, Delivery Order 0001, 2008 Performance-Based Acquisition (PBA) for Environmental Investigation and Remediation at the Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio**

Subject: **Contract Line Item (CLIN) 2.2 – Implementation of Remedial Investigation Work Plan ~ Characterization and Disposal Letter Report for Soil Cuttings and Decontamination Fluids**

Dear Mr. Nichter:

Investigative activities in accordance with the *PBA 2008 Supplemental Investigation Sampling and Analysis Plan Addendum No. 1* (December 2009) (herein referred to as the SAP Addendum No. 1) were performed from February 15, 2010 through April 14, 2010. These activities have resulted in the generation of Investigation-Derived Waste (IDW) consisting of soil cuttings from drilling activities and equipment decontamination fluids. The purpose of this letter is to characterize and classify IDW for disposal and to propose methods for disposing the IDW.

This letter report includes a summary of IDW generated, the origin of the IDW (Table 1), as well as proposed classification and recommendations for disposal of the IDW (Table 2). This letter report follows guidance established by the following:

1) The *Facility-Wide Sampling and Analysis Plan* (USACE 2001) (herein referred to at the Facility-wide SAP);
2) The SAP Addendum No. 1; and
3) Letter to RVAAP/USACE Regarding IDW Disposal Guidance (Ohio EPA, November 3, 1997).

Three distinct IDW streams were sampled as part of the PBA 2008 RI field activities. Each waste stream was composited and sampled on April 14, 2010 per requirements outlined in Section 7.0 of the Facility-wide SAP and SAP Addendum No. 1. IDW streams generated are:

- One (1), 15-gallon drum containing 2% HCl and DI water from equipment decontamination rinse;
- Six (6), 55-gallon drums containing liquinox wash water from equipment decontamination; and
- Twelve (12), 55-gallon drums containing soil and sediment from PBA 2008 RI activities.

Table 1. Summary of Sampled Investigation-Derived Wastes from Sampling Activities for the PBA 2008 Supplemental Investigation Sampling.

Container Number	Container Type and Size	Contents	Generation Date	Sample ID	Date Sampled
SAIC-2009-4	15 Gallon, Poly, Open Top Drum	2% HCl and DI Water	09/22/09 - 4/14/10	PBA-WW-IDW-5787-WW	4/14/2010
SAIC-2010-1	55 Gallon, Steel, Closed Top Drum	Decon Wash Water	01/18/10 – 02/25/10	PBA-WW-IDW-5788-WW	4/14/2010
SAIC-2010-2	55 Gallon, Steel, Closed Top Drum	Decon Wash Water & Purge Water	01/19/10 – 03/29/10	PBA-WW-IDW-5788-WW	4/14/2010
SAIC-2010-3	55 Gallon, Steel, Open Top Drum	Soil Cuttings	02/16/10 – 03/09/10	PBA-SO-IDW-5806-SO	4/14/2010
SAIC-2010-4	55 Gallon, Steel, Open Top Drum	Soil Cuttings	02/23/10 – 03/16/10	PBA-SO-IDW-5806-SO	4/14/2010
SAIC-2010-5	55 Gallon, Steel, Open Top Drum	Soil Cuttings	03/1/10 – 03/12/10	PBA-SO-IDW-5806-SO	4/14/2010
SAIC-2010-6	55 Gallon, Steel, Closed Top Drum	Decon Wash Water	03/2/10 – 03/18/10	PBA-WW-IDW-5788-WW	4/14/2010
SAIC-2010-7	55 Gallon, Steel, Open Top Drum	Soil Cuttings	03/3/10 – 03/9/10	PBA-SO-IDW-5806-SO	4/14/2010
SAIC-2010-8	55 Gallon, Steel, Closed Top Drum	Decon Wash Water	03/3/10 – 03/18/10	PBA-WW-IDW-5788-WW	4/14/2010
SAIC-2010-9	55 Gallon, Steel, Open Top Drum	Soil Cuttings	03/10/10 – 03/23/10	PBA-SO-IDW-5806-SO	4/14/2010
SAIC-2010-10	55 Gallon, Steel, Open Top Drum	Soil Cuttings	03/17/10 – 03/29/10	PBA-SO-IDW-5806-SO	4/14/2010
SAIC-2010-11	55 Gallon, Steel, Open Top Drum	Soil Cuttings	03/18/10 – 04/08/10	PBA-SO-IDW-5806-SO	4/14/2010
SAIC-2010-13	55 Gallon, Steel, Open Top Drum	Soil Cuttings	03/24/10 – 03/25/10	PBA-SO-IDW-5806-SO	4/14/2010
SAIC-2010-14	55 Gallon, Steel, Open Top Drum	Soil Cuttings & Sediment	03/25/10 – 04/07/10	PBA-SO-IDW-5806-SO	4/14/2010
SAIC-2010-15	55 Gallon, Steel, Open Top Drum	Soil Cuttings	04/02/10 – 04/06/10	PBA-SO-IDW-5806-SO	4/14/2010
SAIC-2010-16	55 Gallon, Steel, Open Top Drum	Soil Cuttings	04/02/10 – 04/07/10	PBA-SO-IDW-5806-SO	4/14/2010
SAIC-2010-17	55 Gallon, Steel, Closed Top Drum	Decon Wash Water	03/29/10 – 03/29/10	PBA-WW-IDW-5788-WW	4/14/2010
SAIC-2010-18	55 Gallon, Steel, Closed Top Drum	Decon Wash Water	03/29/10 – 04/14/10	PBA-WW-IDW-5788-WW	4/14/2010
SAIC-2010-19	55 Gallon, Steel, Open Top Drum	Soil Cuttings	03/29/10 – 04/12/10	PBA-SO-IDW-5806-SO	4/14/2010

SAIC-2009-3, SAIC-2010-12, SAIC-2010-20, SAIC-2010-21 are not included in this list as these containers are partially full and have been carried over to future planned PBA 2008 sampling to minimize IDW waste containers. These four containers have not been sampled.

Liquid IDW Discussion

Per Section 7.0 of the Facility-wide SAP, two composite waste samples were collected for Toxicity Characteristic Leaching Procedure (TCLP) parameters and submitted for laboratory analysis to characterize the waste streams for disposal. The first sample (PBA-WW-IDW-5787-WW) characterized one drum of decontamination fluids containing 2% HCl and DI Water. The second sample (PBA-WW-ODW-5788-WW) was composited from six drums containing liquinox wash water from equipment decontamination. Upon receipt of analytical results from the laboratory, the analytical results were validated and reviewed to determine if the waste was potentially hazardous. This review consisted of a comparison of the analytical results against the TCLP criteria presented in Table 7-1, Maximum Concentration of Contaminants for the Toxicity Characteristic (40 *CFR* 261.24), presented in the Facility-Wide SAP (USACE 2001) and Resource Conservation Recovery Act (RCRA) Hazardous Waste regulations 40 *CFR* 261 – 265.

Attachment 1 presents the analytical laboratory data for TCLP analysis for IDW water generated during ongoing field activities. The results are summarized below:

1) All analytical results were below quantitative limits for the IDW liquid sample;
2) The pH for the IDW aqueous waste is considered neutral (2 S. U. < pH < 12 S.U.);
3) The flash point was below detectable limits, >180°F.

Given the observed analytical results, it is recommended that both liquid IDW streams be classified as non-hazardous, non-contaminated.

Solid IDW Discussion

Per Section 7.0 of the Facility-wide SAP, a composite waste sample (PBA-SO-IDW-5806-SO) was collected for TCLP parameters and submitted for laboratory analysis to characterize the soil IDW for disposal. Upon receipt of analytical results from the laboratory, the analytical results were validated and reviewed to determine if the waste was potentially hazardous. This review consisted of a comparison of the analytical results against the TCLP criteria presented in Table 7-1, Maximum Concentration of Contaminants for the Toxicity Characteristic (40 *CFR* 261.24), presented in the Facility-Wide SAP (USACE 2001) and RCRA Hazardous Waste regulations 40 *CFR* 261 – 265.

Attachment 1 presents the analytical laboratory data for TCLP analysis for solid IDW generated during ongoing field activities. The results are summarized below:

1) All analytical results were below quantitative limits for the IDW solid sample;
2) The pH for the IDW sample was neutral, at 7.5 standard units; and
3) The flash point was below detectable limits, >180°F.

Given the observed analytical results, it is recommended that the solid IDW stream be classified as non-hazardous, non-contaminated.

Recommended Disposal Pathways for IDW

Table 2 presents the disposal pathway identified as a result of IDW characterization data. Please note that this IDW has been characterized under provisions of the Facility-Wide SAP and SAP Addendum No. 1 using TCLP analyses and process knowledge. SAIC recommends that all IDW be disposed as non-hazardous, non-contaminated waste to be removed offsite by a permitted water treatment or waste

facility unless the U.S. Army has additional information that would result in the IDW meeting the definition of a listed hazardous waste as defined in 40 *CFR* Part 261 Subpart D.

Table 2. Summary of Final Waste Classification and Recommended Disposal

NON-HAZARDOUS WASTE			
Container Number	**Medium**	**Waste Criterion**	**Disposal Recommendation**
SAIC-2009-4	Liquid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-1	Liquid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-2	Liquid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-3	Solid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-4	Solid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-5	Solid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-6	Liquid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-7	Solid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-8	Liquid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-9	Solid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-10	Solid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-11	Solid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-13	Solid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-14	Solid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-15	Solid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-16	Solid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-17	Liquid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-18	Liquid	Inorganics, organics	Permitted Treatment or Waste Facility
SAIC-2010-19	Solid	Inorganics, organics	Permitted Treatment or Waste Facility

Since RVAAP, under RCRA, is the generator of this material, SAIC requests concurrence or direction on the waste classification and recommended disposal pathways prior to disposal. Following your concurrence, we will proceed with the appropriate waste disposal.

If you have any questions, or require additional information, please do not hesitate to contact me at (330) 405-5822.

Sincerely,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

Amanda Trenton

Amanda Trenton
Project IDW Coordinator

cc: Vicki Deppisch – Ohio EPA
Eileen Mohr – Ohio EPA
Mark Nichter – USACE
Mark Patterson – RVAAP
Christy Esler – RVAAP
Jim McGee – RVAAP/Vista
Kevin Jago – SAIC
Jed Thomas – SAIC
SAIC Contract No. W912QR-04-D-0028 Project File
SAIC Central Records Facility

ATTACHMENT 1
ANALYTICAL RESULTS FOR IDW

Parameter	CAS Number	Units	Maximum Concentration For Toxicity Characteristic	PBA-SO-IDW-5806-SO	PBA-WW-IDW-5787-WW	PBA-WW-IDW-5788-WW
TCLP Herbicides						
2,4,5-TP (Silvex)	93-72-1	mg/L	1	0.1 U	0.1 U	0.1 U
2,4-D	94-75-7	mg/L	10	0.5 UJ	0.5 UJ	0.5 UJ
TCLP Metals						
Arsenic	7440-38-2	mg/L	5	0.5 U	0.5 U	0.008 UJ
Barium	7440-39-3	mg/L	100	0.47 UJ	0.16 UJ	0.023 UJ
Cadmium	7440-43-9	mg/L	1	0.0016 UJ	0.0044 UJ	0.1 U
Chromium	7440-47-3	mg/L	5	0.012 UJ	0.13 UJ	0.0032 UJ
Lead	7439-92-1	mg/L	5	0.0095 UJ	0.062 UJ	0.0044 UJ
Mercury	7439-97-6	mg/L	0.2	0.002 U	0.002 U	0.002 U
Selenium	7782-49-2	mg/L	1	0.25 U	0.25 U	0.25 U
Silver	7440-22-4	mg/L	5	0.5 U	0.5 U	0.0028 UJ
Miscellaneous						
Acid-soluble sulfide	Q1314	mg/kg	-	30.6 J	NA	NA
Acid-soluble sulfide	Q1314	mg/L	-	NA	3 U	3 U
Corrosivity	Q183	No Units	-	7.5	2.3	7.4
Cyanide, Total	57-12-5	mg/kg	-	0.32 J	NA	NA
Cyanide, Total	57-12-5	mg/L	-	NA	0.01 U	0.01 U
Flashpoint	Q376	deg F	-	>180	>180	>180
Percent Solids	Q1082	%	-	75.9	NA	NA
TCLP Pesticides						
Chlordane (technical)	57-74-9	mg/L	0.03	0.005 U	0.005 U	0.005 U
Endrin	72-20-8	mg/L	0.02	0.0005 U	0.0005 U	0.0005 U
Heptachlor	76-44-8	mg/L	0.008	0.0005 U	0.0005 U	0.0005 U
Heptachlor epoxide	1024-57-3	mg/L	0.008	0.0005 U	0.0005 U	0.0005 U
Lindane	58-89-9	mg/L	0.4	0.0005 U	0.000017 J	0.0005 U
Methoxychlor	72-43-5	mg/L	10	0.001 U	0.001 U	0.001 U
Toxaphene	8001-35-2	mg/L	0.5	0.02 UJ	0.02 UJ	0.02 UJ

Parameter	CAS Number	Units	Maximum Concentration For Toxicity Characteristic	PBA-SO-IDW-5806-SO	PBA-WW-IDW-5787-WW	PBA-WW-IDW-5788-WW
TCLP Semi-Volatile Organics						
1,4-Dichlorobenzene	106-46-7	mg/L	7.5	0.004 U	0.004 U	0.004 U
2,4,5-Trichlorophenol	95-95-4	mg/L	400	0.02 U	0.02 U	0.02 U
2,4,6-Trichlorophenol	88-06-2	mg/L	2	0.02 U	0.02 U	0.02 U
2,4-Dinitrotoluene	121-14-2	mg/L	0.13	0.02 U	0.02 U	0.02 U
Hexachlorobenzene	118-74-1	mg/L	0.13	0.02 U	0.02 U	0.02 U
Hexachlorobutadiene	87-68-3	mg/L	0.5	0.02 U	0.02 U	0.02 U
Hexachloroethane	67-72-1	mg/L	3	0.02 U	0.02 U	0.02 U
m-Cresol & p-Cresol	65794-96-9	mg/L	200	0.04 U	0.04 U	0.04 U
Nitrobenzene	98-95-3	mg/L	2	0.004 U	0.004 U	0.004 U
o-Cresol	95-48-7	mg/L	200	0.004 U	0.004 U	0.004 U
Pentachlorophenol	87-86-5	mg/L	100	0.04 U	0.04 U	0.04 U
Pyridine	110-86-1	mg/L	5	0.02 U	0.02 U	0.02 U
TCLP Volatile Organics						
1,1-Dichloroethylene	75-35-4	mg/L	0.7	0.07 U	0.07 U	0.07 U
1,2-Dichloroethane	107-06-2	mg/L	0.5	0.025 U	0.025 U	0.025 U
2-Butanone (MEK)	78-93-3	mg/L	200	0.25 U	0.25 U	0.25 U
Benzene	71-43-2	mg/L	0.5	0.025 U	0.025 U	0.025 U
Carbon tetrachloride	56-23-5	mg/L	0.5	0.025 U	0.025 U	0.025 U
Chlorobenzene	108-90-7	mg/L	100	0.025 U	0.025 U	0.025 U
Chloroform	67-66-3	mg/L	6	0.025 U	0.025 U	0.025 U
Tetrachloroethylene	127-18-4	mg/L	0.7	0.07 U	0.07 U	0.07 U
Trichloroethylene	79-01-6	mg/L	0.5	0.05 U	0.05 U	0.05 U
Vinyl chloride	75-01-4	mg/L	0.2	0.025 U	0.025 U	0.025 U

J = Estimated Concentration, less than the reporting limit – Lab Qualifier
U = Non-detect, concentration reported is reporting limit – Lab Qualifier
UJ = Non-detect, reporting limit estimated – Lab Qualifier
- = No Standard Exists
NA = Not Applicable

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Appendix F-2. Ohio EPA Approval of Waste Characterization

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OhioEPA
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Ted Strickland, Governor
Lee Fisher, Lieutenant Governor
Chris Korleski, Director

June 2, 2010

CERTIFIED MAIL

Mr. Mark Patterson
Installation Manager
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266

RE: ***RAVENNA ARMY AMMUNITION PLANT, PORTAGE/TRUMBULL COUNTIES, DRAFT, INVESTIGATION DERIVEDWASTE AND DISPOSAL PLAN, FWGWMP, FOR THE "IMPLEMENTATION OF REMEDIAL INVESTIGATION WORK PLAN-CHARACTERIZATION AND DISPOSAL, LETTER REPORT FOR SOIL CUTTINGS AND DECONTAMINATION FLUIDS" DATED MAY 25, 2010***

Dear Mr. Patterson:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Implementation of Remedial Investigation Work Plan-characterization and Disposal Letter Report for Soil cuttings and Decontamination Fluids" at the Ravenna Army Ammunition Plant, Ravenna, OH document. This document was received at Ohio EPA, Northeast District Office (NEDO), Division of Emergency and Remedial response (DERR), and is dated May 25, 2010. The document was prepared for the U.S. Army Corps of Engineers (USACE) – Louisville District, by SAIC Engineering of Ohio, Inc., under contract no. W912QR-04-D-0028.

The report is approved and Ohio EPA concurs that the generation of Investigation Derived Waste (IDW) consisting of purged water may be disposed of as non-contaminated, non-hazardous waste and that it be sent off-site for disposal to a permitted water treatment facility.

If you have any questions, please call me at (330) 963-1207.

Sincerely,

Vicki Deppisch
Project Coordinator
Division of Emergency and Remedial Response

VD:ddw

cc: Eileen Mohr, Ohio EPA, NEDO, DERR
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