FINAL

IMA

ADDENDUM #4
TO THE
SAMPLING AND ANALYSIS PLAN
FOR

3d Inf Div (Mech)

PHASE II RCRA FACILITY INVESTIGATIONS
AT THE
FORMER 724TH TANKER PURGING STATION, SWMU 26
AT
FORT STEWART, GEORGIA

Prepared for

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT

Contract No. DACA21-02-D-0004
Delivery Order 0039

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Regulatory Authority

Resource Conservation and Recovery Act,
Title II, Subtitle C, Section 3004;
42 USC 6901 et seq.; 40 *CFR* 264,

May 2007

APPROVALS

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Greg Grim, Program Manager	5/30/07 Date
Patricia Stoll, Project Manager	5/30/07 Date

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ACRONYMS

BGS	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAP	Corrective Action Plan
GA EPD	Georgia Environmental Protection Division
RCRA	Resource Conservation and Recovery Act
RFI	RCRA field investigation
SAP	Sampling and Analysis Plan

1.0 INTRODUCTION

This addendum supplements the *Sampling and Analysis Plan for Phase II RCRA Facility Investigations at the Former 724th Tanker Purging Station, Solid Waste Management Unit 26, at Fort Stewart, Georgia* (SAIC 1997). It addresses the delineation of contamination in groundwater at the Tanker Purging Station. It also presents changes and additions to the Sampling and Analysis Plan (SAP) and the specific sampling requirements for the performance of these field activities.

A Phase II Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) was completed at the site, and the revised final Phase II RFI report was submitted to the Georgia Environmental Protection Division (GA EPD) on November 24, 1998. The Phase II RFI report recommended that a Corrective Action Plan (CAP) be prepared, which was submitted to GA EPD in July 1999. The CAP recommended that an enhanced bioremediation system (PHOSter®II) be installed at the site.

This addendum includes installing soil borings to locate the extent of a spill at the site, installing additional monitoring wells, conducting semiannual groundwater sampling, and conducting a one-time sampling event surrounding the area of the spill.

2.0 PROJECT ORGANIZATION

The organizational chart for this addendum is presented in Figure 1.

3.0 FIELD ACTIVITIES

This chapter describes the field activities that will be conducted to delineate the soil and groundwater contamination at the Solid Waste Management Unit 26 site. Table 1 presents the sample numbering system that will be used for this investigation. The site-specific investigative activities for the site are presented in Table 2.

3.1 INSTALLATION OF SOIL BORINGS

A total of ten soil borings will be installed to define the extent of the spill area at the site. The new soil borings will be installed to approximately 15 ft below ground surface (BGS). Soil samples for benzene, toluene, ethylbenzene, and xylenes (BTEX) analysis will be collected from the two intervals exhibiting the highest organic vapor headspace reading above the water table each boring. After encountering the water table, groundwater will be collected and sampled for BTEX. The locations of these borings will depend upon field readings. Initially, soil borings will be located on the four sides of the suspected spill area.

3.2 MONITORING WELL INSTALLATION

Based on the results of the soil borings, three new 2-in. monitoring wells will be installed, one deep and two shallow, to characterize the area around the spill using the hollow-stem auger drilling method. One

shallow/deep pair will be located in the area exhibiting the highest contamination based on field measurements. The remaining well will be located downgradient of the shallow/deep pair. The procedures and methodology for hollow-stem auger drilling are presented in the SAP. The three new wells will be installed to approximately 25 ft BGS for the deep well and 15 ft BGS for the shallow wells. The monitoring wells will be developed in accordance with the procedures and methodology presented in the SAP. Upon completion of the development activities, the new monitoring wells will be sampled for BTEX analysis.

3.3 GROUNDWATER SAMPLING

Groundwater will be sampled in the 20 shallow wells surrounding the spill area. This will be a one-time sampling event to determine the extent of any groundwater contamination resulting from the spill. In addition, semiannual groundwater samples will be collected from a total of 40 monitoring wells—the 41 existing wells and the 10 new wells (5 additional wells are proposed in Option 1)—using low-flow techniques. Samples will be analyzed at an off-site laboratory for BTEX. Field parameters measured during sampling will include dissolved oxygen, temperature, oxidation-reduction potential, conductivity, and pH. The procedures and equipment for groundwater sampling are presented in the SAP.

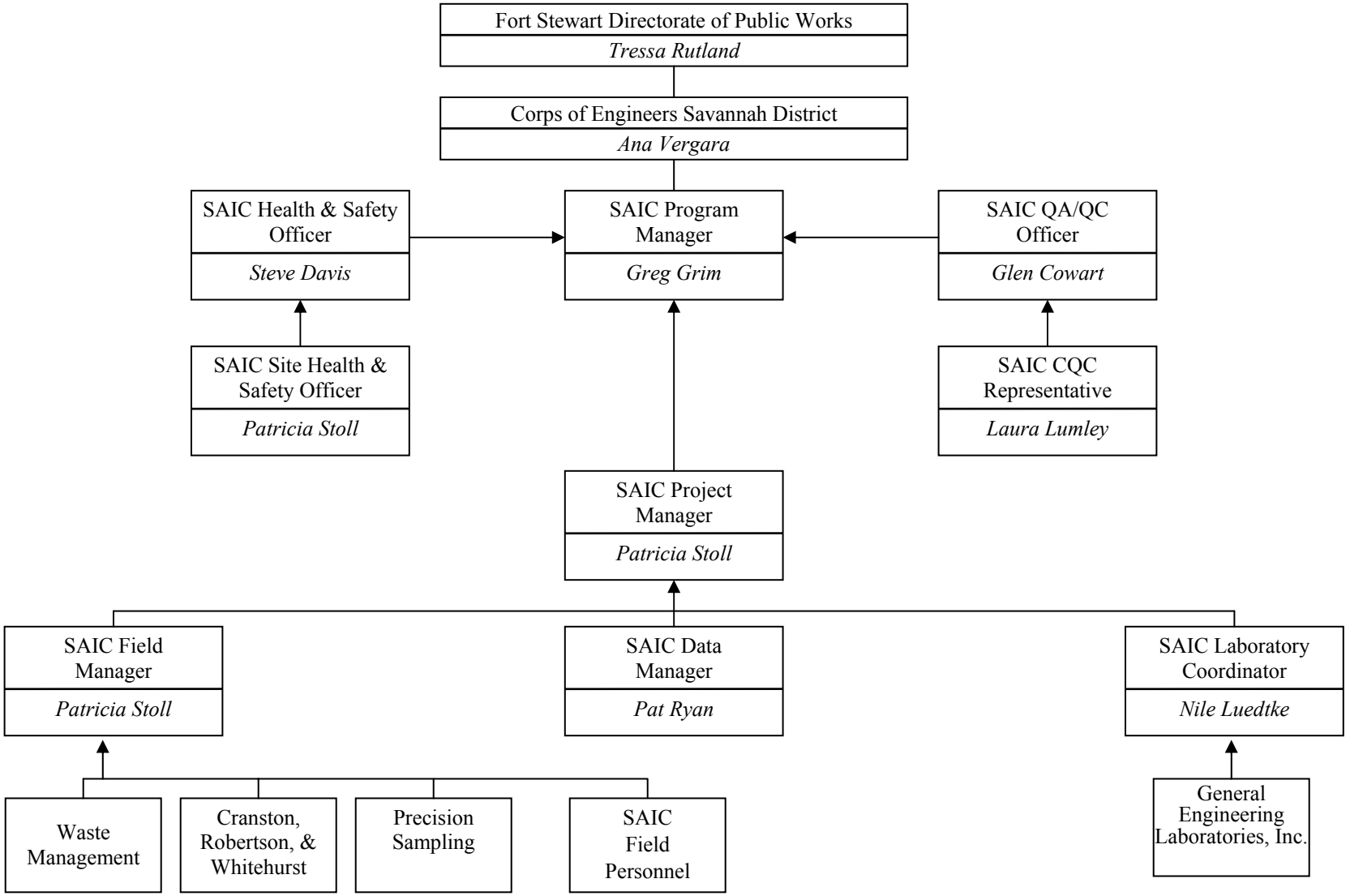
3.4 WATER LEVEL MEASUREMENT

Static water level measurements will be collected from each monitoring well before groundwater sampling. The procedures and equipment are presented in the SAP.

4.0 REFERENCES

SAIC (Science Applications International Corporation) 1997. *Sampling and Analysis Plan for Phase II RCRA Facility Investigations at the Former 724th Tanker Purging Station, Solid Waste Management Unit 26, at Fort Stewart, Georgia*, April.

USACE (U. S. Army Corps of Engineers) 2001. Engineering and Design – Requirements for the Preparation of Sampling and Analysis Plans, available at <http://www.usace.army.mil/inet/usace-docs/eng-manuals/em200-1-3/toc.htm>.



Refer to Chapter 3 of the project Quality Assurance Project Plan for the laboratory organization breakdown.

Figure 1. Revised Organizational Chart for SWMU 26 at Fort Stewart, Georgia

Table 1. Sample Number System for SWMU 26

Sample Identification: XXMLT#	
XX = Area Designator	Area designators used for the project will be the SWMU number **Examples** 26 = SWMU 26
M = Sample Media	**Examples** 1 = Soil 2 = Sediment 3 = Surface water 4 = Groundwater 5 = Soil screening 6 = Groundwater screening 7 = Soil from injection-point installation 8 = Pre-pilot soil from inside trench 9 = Injection-point groundwater 0 = Gas A = Temporary piezometer groundwater B = Temporary piezometer groundwater C = Monitoring well soil D = Monitoring well groundwater
L = Borehole/Sample Location	Sample locations will be consecutive starting from the last sample location **Examples** 1 = First sample location (MW-1, BS-1) 2 = Second sample location (MW-2, BS-2) 0 = Tenth sample location (MW-10, TP-10) J = Nineteenth sample location (MW-19, TP-19) M = Twenty-first sample location (MW-21, TP-21) P = Twenty-third sample location (MW-23, TP-23) R = Twenty-fourth sample location (MW-24, TP-24) **B, C, or D** 1 = Thirty-third sample location (MW-33, TP-33) 2 = Thirty-fourth sample location (MW-34, TP-34)
T = Sample Type	**Examples** 1 = Environmental sample 2 = Duplicate sample 3 = QA split sample 4 = Rinsate blank 5 = Investigation-derived waste sample
# = Sample Number	Sample number will be a sequential number **Examples** 1 = First sample from borehole 2 = Second sample from borehole

All trip blanks used during the project will be consecutively identified.
QA = Quality assurance.
SWMU = Solid waste management unit.

Table 2. Summary of Soil and Groundwater Samples to Be Collected at SWMU 26

Matrix	Analysis	Analytical Procedures	No. Field Samples	QC Duplicates[a]	Field Rinsates[b]	QC Trip Blanks	Total Samples	Holding Time	Preservation Requirements	Sample Containers
Groundwater	BTEX	EPA 8260B	110	10	5	5	130	14 days	Cool to 4°C HCl pH<2	Two 40-mL GSV[c]
Soil	BTEX	EPA 8260B	20	2	0	0	22	48 hr	Cool to 0°C	Encore™
IDW Water	VOCs	EPA 8260B	1	0	0	0	1	14 days	Cool to 4°C[c] HCl pH <2	Two 40-mL GSV[c]
	Oil & Grease	EPA 413.2	1	0	0	0	1	28 days	Cool to 4°C H_2SO_4	Two 1-L AG
	Total Phenols	EPA 420.1/420.2	1	0	0	0	1	28 days	Cool to 4°C H_2SO_4	Two 1-L AG
	pH	EPA 150.1	1	0	0	0	1	ASAP	Cool to 4°C	One 250-mL HDPE

[a]The number of QC duplicate samples represents a 10% distribution between the different types of investigations to be conducted; however, the actual number of duplicates collected for each investigation type might vary slightly from the distribution presented.
[b]The number of QC rinsate blank samples represents a 5% distribution between the different types of investigations to be conducted; however, the actual number of blanks collected for each investigation type might vary slightly from the distribution presented.
[c]Sample containers will be filled so that no headspace is present.
AG = Amber glass.
ASAP = As soon as possible.
BTEX = Benzene, toluene, ethylbenzene, and xylenes.
EPA = U. S. Environmental Protection Agency.
GSV = Glass septa vial.
HDPE = High-density polyethylene.
IDW = Investigation-derived waste.
QC = Quality control
SWMU = Solid waste management unit.
VOC = Volatile organic compound.
[This table is in conformance with EM 200-1-3 (USACE 2001)].