

**Swift & Staley Team/DOE Paducah Site  
Classification Office (CO)/Technical Information Office (TIO)  
and Operations Security (OPSEC) Release Form**

To Be Completed by Person Requesting Release  
(Required to be completed prior to submittal to CO/TIO/OPSEC)

Date 02/05/2010 Date Release is Required 02/05/2010  
Person Requesting Release Teresa Overby Phone Number 5188  
Mailing Address \_\_\_\_\_  
Organization PRS  
Document Number PRS-ENM-0023 Number of Pages 9  
Accession Number (DMC only) \_\_\_\_\_  
Document Title/Date Composite Sampling  
\_\_\_\_\_  
Author \_\_\_\_\_ Corporate Author \_\_\_\_\_  
**Media** (Check all that apply)  
 Paper  Photo  Diskette  Drawing  Video  CD  Report/Letter  Other \_\_\_\_\_  
Project Subcontract/Task Order \_\_\_\_\_  
Requestor/Purpose of Release Release to Regulators and Stakeholders (public)

**DO NOT WRITE BELOW THIS LINE – CO/TIO/DC/OPSEC USE ONLY**

---

<b>Classified</b>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<b>UCNI</b>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<b>ECI</b>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<b>OUO</b>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

**Type of Release** (Check One)  
 Public Release  Internal Release Only  Limited Release

**Reason** (Check all that apply)  
 Circumvention of Statute  Statutory Exemption  Commercial/Proprietary  
 Personal Privacy  Privileged Information  OPSEC

Other/Comments \_\_\_\_\_

---

DC	<u><i>MBreneman</i></u>	Date <u>2.5.10</u>
TIO	<u><i>MBreneman</i></u>	Date <u>2.5.10</u>
Reviewing Official*	_____	Date _____
OPSEC	<u><i>MBreneman</i></u>	Date <u>2.5.10</u>

\*Signature required for documents containing information in UCNI subject area.



# PADUCAH

## Remediation Services

*A Portage Shaw Joint Venture Company*

OWNER: Environmental Monitoring	PRS-ENM-0023	REV. NO. 0
SUBJECT MATTER AREA: Engineering Management	PREPARER: C. S. Jones	Page 1 of 9
DOC TYPE: <input checked="" type="checkbox"/> PROCEDURE <input type="checkbox"/> POLICY	APPROVED BY/DATE: Tracey Brindley, (Signature on file in DCC) 2/22/2008	
PROC TYPE: <input checked="" type="checkbox"/> OPERATING PROCEDURE <input type="checkbox"/> FACILITY SPECIFIC PROCEDURE FACILITY: _____		
TITLE:  COMPOSITE SAMPLING		
USQD <input checked="" type="checkbox"/> UCD <input checked="" type="checkbox"/> CAT EX <input type="checkbox"/>	EFFECTIVE DATE: 3/15/2008	
USQD/UCD No: USQD-PH-SITE-0111/UCD-PH-SITE-0179	REQUIRED REVIEW DATE: 3/15/2011	
Mandatory Subcontractor Pro Forma Procedure? <input type="checkbox"/>	If an interim Procedure, Expiration Date:	

REVISION LOG		
Revision Number	Description of Changes	Pages Affected
0	Intent Change. Revise as a PRS Environmental Monitoring technical procedure for collecting composite samples.	All

### TABLE OF CONTENTS

1.0	PURPOSE .....	3
2.0	SCOPE .....	3
3.0	PRECAUTIONS AND LIMITATIONS.....	3
3.1	ES&H Precautions.....	3
3.2	Work Environment or Other Location .....	3
4.0	PREREQUISITES .....	3
4.1	Project-Specific Documentation .....	3
4.2	Procedures, Guidance.....	3
4.3	Training .....	4
5.0	OTHER DOCUMENTS NEEDED .....	4
6.0	ACTIONS.....	4
6.1	Approvals and Notifications.....	4
6.2	Special Tools, Equipment, Parts, and Supplies .....	4
6.3	Pre-Performance Activities.....	5
6.4	Collection of Composite Samples—General Steps.....	5
6.5	Surface Soil, Sludge, and Sediment Compositing.....	6

6.6	Subsurface Soil Compositing .....	6
6.7	Surface Water Compositing .....	7
6.8	Surface Water Timed Compositing .....	7
6.9	Groundwater Compositing.....	7
6.10	Post-Performance Activities .....	8
7.0	RECORDS.....	8
7.1	General Requirements .....	8
7.2	Quality Records.....	8
8.0	SOURCE DOCUMENTS .....	8
	Attachment—Definitions/Acronyms .....	9

<b>OWNER: Environmental Monitoring</b>	<b>PRS-ENM-0023</b>
<b>TITLE: Composite Sampling</b>	<b>REV. NO. 0</b>
	<b>Page 3 of 9</b>

## **1.0 PURPOSE**

The purpose of this procedure is to define composite samples and the requirements for sample compositing techniques.

## **2.0 SCOPE**

This procedure applies to any person performing environmental sampling activities for work coordinated by PRS at the DOE-owned Paducah Site.

## **3.0 PRECAUTIONS AND LIMITATIONS**

### **3.1 ES&H Precautions**

- 3.1.1** Field personnel are required to wear protective clothing and equipment as specified in the AHA.
- 3.1.2** Composite samples should **NOT** be collected when there is a potential risk of dangerous chemical reaction.

### **3.2 Work Environment or Other Location**

- 3.2.1** Composite samples normally are not an acceptable means of collecting samples to be analyzed for VOCs, SVOCs, and dissolved gases.
- 3.2.2** Composite samples shall not be collected when the measure of contamination variation as a function of the location is important.
- 3.2.3** Composite samples are average values that are useful in estimating overall site properties. They are not representative of the variability of contaminant levels at specific locations.

## **4.0 PREREQUISITES**

### **4.1 Project-Specific Documentation**

Field personnel must be familiar with project-specific documents, as applicable, which may include all or some of the following plans: health and safety plan, quality assurance project plan, site-specific SAP, and waste management plan. A copy of each shall be available in the field office before the onset of any field activities. Consult these documents, as necessary, to obtain specific information regarding equipment and supplies, health and safety, sample collection and identification, sample packaging, decontamination, etc.

### **4.2 Procedures, Guidance**

Field personnel must be knowledgeable of the latest version of the procedures included in Section 5 of this procedure before beginning any soil collection activities.

OWNER: Environmental Monitoring	PRS-ENM-0023
TITLE: Composite Sampling	REV. NO. 0
	Page 4 of 9

### 4.3 Training

Collection of samples shall be limited to those individuals who are fully trained and knowledgeable of field procedures applicable to the collection of samples.

### 5.0 OTHER DOCUMENTS NEEDED

- DOE Order 5400.5, Radiation Protection of the Public and the Environment
- PRS-ENM-5003, *Quality Assured Data*
- PRS-ENM-2700, *Logbooks*
- PRS-ENM-2708, *Sample Chain-of-Custody*
- PRS-ENM-2101, *Groundwater Sampling*
- PRS-ENM-2300, *Soil Sampling*

**NOTE 1:** Definitions and acronyms are provided in Attachment A.

### 6.0 ACTIONS

#### 6.1 Approvals and Notifications

- 6.1.1 Make appropriate notifications for any sampling activity to be conducted in areas of the Paducah Site leased to the United States Enrichment Corporation.
- 6.1.2 Issue any required permits (i.e., excavation or penetration permit due to underground lines or utilities, etc.).

#### 6.2 Special Tools, Equipment, Parts, and Supplies

Ensure that all of the appropriate items needed to complete a specific sampling task are gathered and taken into the field:

- Site-specific plan;
- Field logbook;
- Indelible black ink pens and markers;
- Measuring tape;
- Labels and appropriate forms/documentation for sample shipment including chain-of-custody forms, custody seals, sample labels;
- Sampling tools and equipment;

OWNER: Environmental Monitoring	PRS-ENM-0023
TITLE: Composite Sampling	REV. NO. 0
	Page 5 of 9

- Plastic sheeting; and
- Decontamination equipment.

### 6.3 Pre-Performance Activities

- 6.3.1 Don the appropriate personal protective clothing as dictated by the AHA.
- 6.3.2 Survey (use of GPS system may be utilized) and stake sampling locations and determine appropriate sampling requirements.
- 6.3.3 Place clean plastic sheeting on a flat and level surface near the sampling area, if possible.
- 6.3.4 Place decontaminated equipment to be used on the plastic **AND** place the sample cooler(s) on separate plastic sheeting.
- 6.3.5 Cover all equipment and supplies with clean plastic sheeting when not in use.
- 6.3.6 Set up the decontamination line if required. Any decontamination should be staged on plastic sheeting.

### 6.4 Collection of Composite Samples—General Steps

**NOTE 1:** Follow these general steps when compositing any samples using methods described in Section 6.5 through 6.9.

- 6.4.1 **IF** sampling locations cannot be sampled due to a physical obstruction,  
**THEN** contact the Environmental Monitoring manager or designee.
- 6.4.2 **WHEN** the manager approves the changes,  
**THEN** move the sampling location  
**AND** document the change in the field logbook  
**AND** notify the data manager.
- 6.4.3 Document the sampling events by recording the information in the logbook.
- 6.4.4 Clear away any vegetation or debris from the sampling location surface.
- 6.4.5 If subsurface soils are collected, place plastic sheeting over the boring location so soil cuttings have minimal contact with the ground surface prior to containerization.
- 6.4.6 Place all decontaminated equipment in plastic sheeting.

OWNER: Environmental Monitoring	PRS-ENM-0023
TITLE: Composite Sampling	REV. NO. 0
	Page 6 of 9

- 6.4.7 Carefully remove the top ½ to ¾ inch of exposed soil, sediment, or sludge before sample collection unless otherwise specified.
- 6.4.8 First collect sample portions or aliquots for volatile analyses and/or for any other samples that would be degraded by aeration and continue collection of remaining samples
- 6.4.9 Follow applicable sampling requirements related to data quality.
- 6.4.10 Complete chain-of-custody forms as described in procedure PRS-ENM-2708, *Sample Chain-of-Custody*.

### 6.5 Surface Soil, Sludge, and Sediment Compositing

- 6.5.1 Consult the site-specific SAP if applicable for composite sample frequency, location, and techniques. Follow guidance herein if technique is not described in the plan.
- 6.5.2 Carefully remove stones, vegetation, snow, etc., from the sampling location surface.
- 6.5.3 Carefully remove the top ½ to ¾ inch of exposed soil, sediment, or sludge before sample collection unless the SAP indicates otherwise.
- 6.5.4 Collect equal volumes from each of the specified sampling locations. The volume of each sample must be at least the amount required for a single sample.
- 6.5.5 Place the samples in an appropriate container and thoroughly homogenize using a stainless steel spatula or other appropriate equipment.
- 6.5.6 Transfer subsamples of the composited sample into the appropriate sample containers and seal the container.
- 6.5.7 Wipe the containers clean with a Kimwipe™, paper towel, or other appropriate media.
- 6.5.8 Place appropriate labels on the sample containers and secure with waterproof tape unless directed otherwise in the site-specific SAP.
- 6.5.9 Complete chain-of-custody forms as described in PRS-ENM-2708, *Sample Chain of Custody*.
- 6.5.10 Place samples in a sample cooler container in ice (or blue ice if required for VOC preservation).
- 6.5.11 Decontaminate sampling equipment.

### 6.6 Subsurface Soil Compositing

OWNER: Environmental Monitoring	PRS-ENM-0023
TITLE: Composite Sampling	REV. NO. 0
	Page 7 of 9

- 6.6.1 Consult the site-specific SAP, if applicable, for composite sample frequency and locations.
- 6.6.2 Place the soil samples in an appropriate container, making sure that equal amounts of sample from each depth/location are used.
- 6.6.3 Repeat Steps 6.5.5 through 6.5.10.

### **6.7 Surface Water Compositing**

- 6.7.1 Consult the site-specific SAP, if applicable, for composite sample frequency and location.
- 6.7.2 Collect equal volumes from each sample location. The volume of each sample must be at least the amount required for a single sample.
- 6.7.3 Repeat Steps 6.5.5 through 6.5.10.

### **6.8 Surface Water Timed Compositing**

- 6.8.1 Consult the site-specific SAP, if applicable, for composite sample frequency and location.
- 6.8.2 Use automated EMS to determine mass-per-unit time concentrations and to identify sporadically discharged contaminants from outfalls or streams. The system can be used for basins, ponds, pools, lakes, or streams.
- 6.8.3 Place the automated EMS with the sample collection jar near the specified sample point. (A refrigerated jar is required if samples should be at 4 °C.)

**NOTE 1:** To minimize disturbance of sediments, carefully place the automated EMS at the specified sample point.

- 6.8.4 Set mechanisms on the EMS to collect a selected volume at the desired time frequency (e.g., 250 mL of the total discharge at the same time each hour).
- 6.8.5 Mix and decant samples into the appropriate sample containers.
- 6.8.6 Repeat Steps 6.5.6 through 6.5.10.

### **6.9 Groundwater Compositing**

- 6.9.1 Consult the site-specific SAP, if applicable, for composite sample frequency and location.
- 6.9.2 Conduct groundwater sampling activities following PRS-ENM-2101, *Groundwater Monitoring Sampling*.



OWNER: Environmental Monitoring	PRS-ENM-0023
TITLE: Composite Sampling	REV. NO. 0
	Page 8 of 9

## 6.10 Post-Performance Activities

6.10.1 Obtain radiation screening results, when required, for an aliquot of the sample for shipment to an off-site laboratory.

6.10.2 Monitor all samples as required for radioactivity before shipment from the Paducah site to ensure that allowable total and transferable surface contamination levels for various radionuclides is below levels established by DOE Order 5400.5.

**NOTE 1:** Include a copy of the off-site survey with each shipment.

6.10.3 Dispose of excess sample media, personal protective equipment, plastic, and other waste materials as specified by the waste management plan, Statement of Work, or other applicable documents.

## 7.0 RECORDS

### 7.1 General Requirements

Records generated as a result of this procedure shall be processed and maintained in accordance with requirements in procedure PRS-DOC-1009, *Records Management*.

### 7.2 Quality Records

7.2.1 Field logbook/field data forms.

7.2.2 Chain-of-custody forms.

## 8.0 SOURCE DOCUMENTS

- EPA/540/P-87/001, December 1987. *A compendium of Superfund Field Operations Methods*, U.S. Environmental Protection Agency, OSWER Directive 9355.0-14.
- U.S. Environmental Protection Agency, Region 4, Environmental Compliance Branch, *Standard Operating Procedures and Quality Assurance Manual*, 1996.

<b>OWNER: Environmental Monitoring</b>	<b>PRS-ENM-0023</b>
<b>TITLE: Composite Sampling</b>	<b>REV. NO. 0</b>
	<b>Page 9 of 9</b>

**Attachment  
Definitions/Acronyms  
Page 1 of 1**

**DEFINITIONS**

**Composite Samples**—Samples that consist of two or more subsamples taken from a specific media and locations at a specific point in time. The subsamples are collected and mixed, and a single average sample is taken from the mixture.

**ACRONYMS**

**DOE**—U.S. Department of Energy

**EMS**—Environmental Monitoring Sampler

**GPS**—global positioning satellite

**PRS**—Paducah Remediation Services, LLC

**SAP**—Sampling and Analysis Plan

**SVOC**—semivolatile organic compound

**VOC**—volatile organic compound