

**Title and Approval Page**

# **Sampling and Analysis Plan (SAP)**

## **Soil Gas Survey**


### **Providence Barrel Superfund Site Smithfield, RI**

**November 2007**

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
NEW ENGLAND REGIONAL LABORATORY  
OFFICE OF ENVIRONMENTAL MEASUREMENT & EVALUATION  
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Prepared for: Office of Site Remediation & Restoration, Removal Program  
U.S. Environmental Protection Agency, New England

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Approved by:  Date: 11/20/07  
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## 1. Introduction

**This SAP is an addendum to the QAU approved Generic Air QAPP, revision 2, October, 2007, RFA # 08002.**

The EPA New England, Office of Environmental Measurement and Evaluation (OEME), at the request of Mia Pasquerella, On-Scene Coordinator (OSC) for the Providence Barrel Site in Smithfield, Rhode Island, will perform soil gas sampling and analysis and inspect residential basements for soil gas points of entry and collect samples as needed during the week of December 3. Five to ten homes will be selected by the OSC for this project based on if the contaminated groundwater plume is moving underneath the buildings. The OSC will use the consultant firm, Sovereign, to insert soil gas sampling probes with a Geoprobe as close to the foundation as possible and to a depth slightly below the buildings footings/basement slab. Peter Kahn is the EPA project manager for this study and will be responsible for the following tasks: write the Sampling and Analysis Plan (SAP), communicate all aspects of the project to the OSC, coordinate the EPA field and laboratory analytical support with OEME laboratory personnel, prepare and collect canister confirmation soil gas and air grab samples and prepare the final report. Scott Clifford will be responsible for collecting grab samples and on-site analysis of soil gas and air grab samples using the OEME Mobile Laboratory. Dan Curran will operate the OEME Laboratory GC/MS which will be used to analyze canister confirmation soil gas and air grab samples. Sovereign's work will be managed by the OSC and will include installing Geoprobe soil gas sampling probes and collecting samples from these wells for EPA on-site analysis. The SAP will be distributed to Mia Pasquerella and all other interested parties.

The compounds of concern for this project are tetrachloroethylene (PCE) and trichloroethylene (TCE). RIDEM has adopted the Connecticut standards for indoor air, groundwater volatilization and soil vapor intrusion. The residential soil vapor volatilization criteria for TCE and PCE are 0.14 ppm and 0.56 ppm, respectively. The residential target indoor air concentrations for TCE and PCE are 1 ug/m<sup>3</sup> (0.186 ppb) and 5 ug/m<sup>3</sup> (0.737 ppb), respectively. Table 1 shows the complete list of VOCs that will be reported for this project.

## 2. Sampling Design

The five to ten homes selected by Mia Pasquerella for this project will be adjacent to the site and situated above the contaminated groundwater plume. Mia will obtain property access agreements and contract with the consultant firm, Sovereign who will insert soil gas sampling probes with a Geoprobe as close to the foundation as possible and to a depth slightly below the buildings footings/basement slab. They will also collect soil gas samples which will be analyzed on-site by the EPA Mobile Lab. If access can be obtained to get inside the homes, EPA will inspect areas where soil gases have the greatest potential to migrate into the basement (i.e. openings in the basement walls and floors and drain pipes) and collect air grab samples from these areas. Initially, all soil gas and air grab samples will be analyzed on-site using a portable GC. The data will

be reviewed as it becomes available and at the discretion of Peter Kahn and Scott Clifford a soil gas grab sample will be collected with a canister and brought back to the EPA Laboratory for GC/MS confirmation analysis. The collected data will be evaluated by a risk assessor, who will determine if detected levels pose a risk to the building occupants.



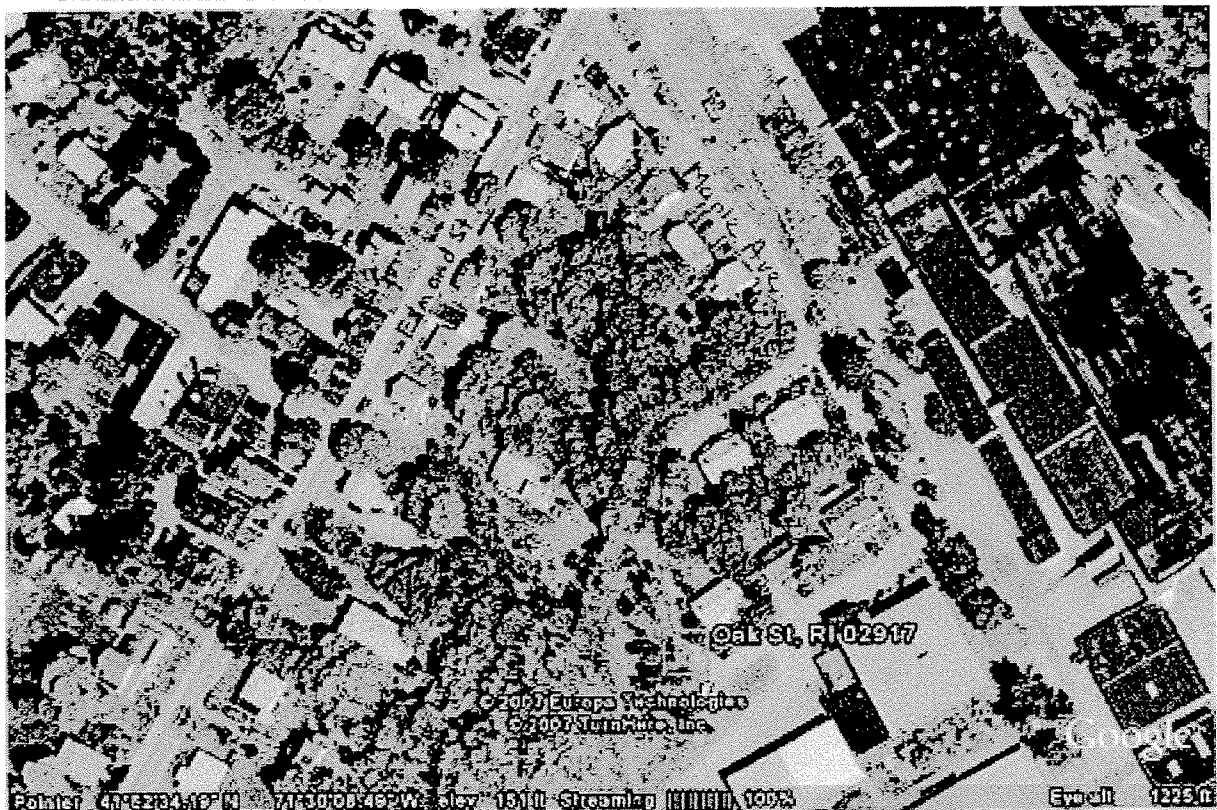
### 3. Sampling and Analytical Summary Table

Parameter	Matrix	Number of Samples (Include field QC)	Analytical Methods	Sampling SOPs	Containers	Preservation	Maximum Holding Time
VOCs	air	15 (10%)	EIASOP-Aircan9	ECASOP-CanisterSampling.SOP.Rev4.doc	6 L canisters	none	14 days
VOCs	air	30 (10%)	EIASOP-FLDGRAB4 (field work)	none	syringe	none	none
VOCs	soil gas	30 (10%)	EIASOP-FLDGRAB4 (field work)	none	syringe	none	none



## 4. Site Map

SITE LOCATION MAP



**TABLE 1-EPA METHOD TO15 TARGET VOC LIST**

1,1,1-Trichloroethane  
1,1,2,2-Tetrachloroethane  
1,1,2-Trichloroethane  
1,1-Dichloroethane  
1,1-Dichloroethylene  
1,2,4-Trichlorobenzene  
1,2,4-Trimethylbenzene  
1,2-Dibromoethane  
1,2-Dichlorobenzene  
1,2-Dichloroethane  
1,2-Dichloropropane  
1,3,5-Trimethylbenzene  
1,3-Butadiene  
1,3-Dichlorobenzene  
1,4-Dichlorobenzene  
2-Hexanone  
4-Ethyl Toluene  
Acrylonitrile  
Allyl Chloride  
Benzene  
Benzylchloride  
Bromodichloromethane  
Bromoform  
Carbon Tetrachloride  
Chlorobenzene  
Chloroethane  
Chloroform  
Cyclohexane  
Dibromochloromethane  
Dichlorodifluoromethane (F12)  
Dichlorotetrafluoroethane  
Ethyl Benzene  
Heptane  
Hexachloro-1,3-butadiene  
Hexane  
Methyl Ethyl Ketone  
Methyl Isobutyl Ketone  
Methyl-t-butyl ether  
Methyl Bromide (Bromomethane)  
Methyl Chloride (Chloromethane)  
Methylene Chloride  
Styrene  
Tetrachloroethene  
Tetrahydrofuran  
Toluene  
Trichloroethene  
Trichlorofluoromethane  
Trichlorotrifluoroethane  
Vinyl Bromide  
Vinyl Chloride  
cis-1,2-Dichloroethene  
cis-1,3-Dichloropropene  
m,p-Xylene  
o-Xylene  
trans-1,2-Dichloroethene  
trans-1,3-Dichloropropene