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WORK PLAN FOR SOIL GAS SAMPLING AT THE ENVIRITE FACILITY IN THOMASTON, CONNECTICUT

Prepared for

Envirite Corporation
Plymouth Meeting, PA

Prepared by

ENVIRON Corporation
Arlington, VA

July 23, 1996

ENVIRITE CORPORATION
TECHNOLOGY FOR THE ENVIRONMENT

July 29, 1996

Mr. Raphael J. Cody, Project Manager
Corrective Action Section - HBT
Office of Site Remediation and Restoration
United States Environmental Protection Agency
J. F. Kennedy Federal Building
Boston, MA 02203-2211

By FedEx

Re: RCRA Docket I-90-1032: Envirite Corporation; Soil Gas Survey Work Plan

Dear Mr. Cody,

Pursuant to your final comments on Envirite's Phase I Interim Report dated March, 1995 attached is a brief work plan describing the manner by which Envirite intends to quantify and qualify the potential presence of vinyl chloride. This work plan replaces the draft work plan that Envirite submitted to you on June 20, 1996, as it amends the draft plan in accordance with our telephone conversations during the past several weeks. Envirite requests that you review and approve the enclosed plan.

Please be advised that Envirite will notify the Agency at least one week in advance of performing any field sampling work described in the plan.

Should you have any questions or comments, please do not hesitate to contact either John Krupa or me.

Thank you for your attention in this matter.

Very truly yours,

William R. McTigue Jr.

William R. McTigue, Jr.
Director, Environmental Affairs

cc: C. Brammer, D. Duva, T. Griffith, J. Krupa, R. Machado, F. Marrazza, T. McCrum,

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I. PROJECT SCOPE

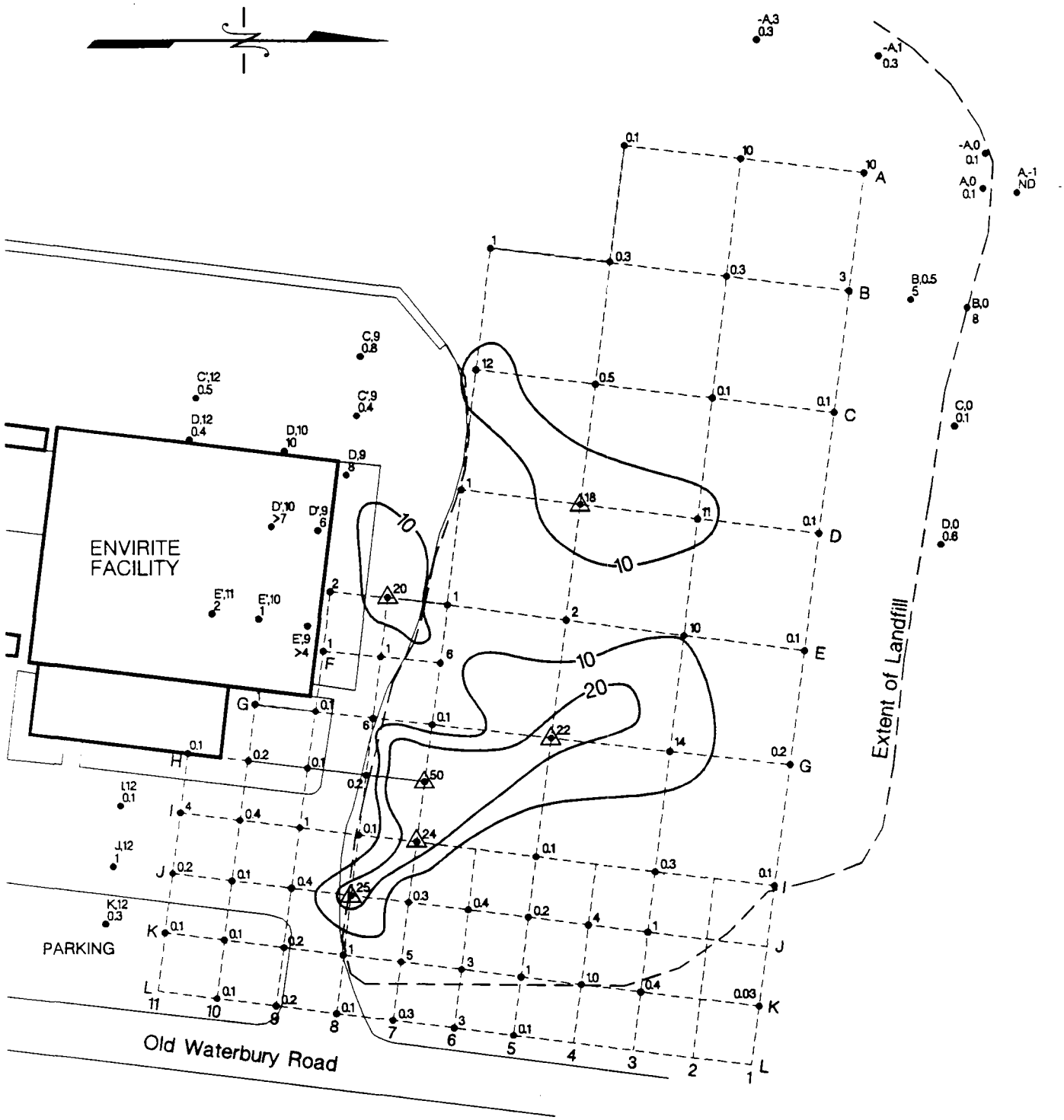
A. Background

Envirite Corporation (Envirite) operated a hazardous waste treatment and nonhazardous solid waste disposal facility ("site") in Thomaston, Connecticut from 1975 until 1990. In November 1990, Envirite and the United States Environmental Protection Agency (USEPA) entered into a Consent Agreement issued under Section 3008(h) of the Resource Conservation and Recovery Act (RCRA) requiring Envirite to investigate the nature, rate, and extent of migration of potential releases of hazardous constituents from the solid waste management units at the facility.

Pursuant to the Consent Agreement, a RCRA Facility Investigation (RFI) Phase I report was prepared for Envirite by GZA GeoEnvironmental, Inc. (GZA) and submitted to USEPA in March 1995. This Phase I RFI report includes the results of soil and ground water samples collected at the site and analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals. A soil gas survey was also conducted by GZA, which involved the collection of soil gas samples from 92 locations on a sampling grid shown in Figure 1. This included survey points in the vicinity of an oily sludge, which was discovered in the northeast corner of the site in 1975 prior to Envirite's operations at the site ("Pre-Envirite Waste Material").

VOCs detected in the soil or ground water samples include tetrachloroethene (PCE), trichloroethene (TCE), 1,1-dichloroethene (1,1-DCE), *trans*-1,2-dichloroethene (t-1,2-DCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,2-dichloroethane (1,2-DCA), and vinyl chloride. The primary VOC detected in soil gas was PCE. As shown in Figure 1, there are three primary areas at the site in which PCE was detected in soil gas. Other VOCs included in the soil gas survey include TCE, 1,1-DCE, t-1,2-DCE, 1,1,1-TCA, and 1,2-DCA. Vinyl chloride could not be detected in the soil gas survey performed by GZA.

Because vinyl chloride is a natural degradation product of PCE, USEPA has requested the collection of a limited number of soil gas samples to quantify concentrations of vinyl chloride in soil gas at the site. Envirite has retained ENVIRON Corporation (ENVIRON) to prepare a work plan for this soil gas survey. The results of this soil gas survey will be incorporated into the RFI Supplement and the final Public Health and Environmental Risk Evaluation (PHERE).



ENVIRON
A Division of APBI
Environmental Sciences Group, Inc.

GZA SOIL GAS SURVEY RESULTS
PERCHLOROETHYLENE - ENVIRITE CORPORATION
THOMASTON, CONNECTICUT

Figure 1

B. Soil Gas Survey Design

The soil gas survey will be conducted in a phased manner. The first phase, described below, is designed to evaluate whether vinyl chloride is present in significant[1] concentrations at the site. As shown in Figure 1, PCE was detected in relatively low concentrations in soil gas. Although PCE was detected in soil samples, no vinyl chloride has been detected in soil samples. Since vinyl chloride can be formed as an intermediate product in the biodegradation of PCE, under certain environmental conditions, this initial phase will focus on locations where the highest concentrations of vinyl chloride may be expected.

Generally, the highest concentrations of vinyl chloride in soil gas would be expected in locations where the highest concentrations of PCE have been detected. Thus, soil gas samples will be collected for vinyl chloride and PCE analysis at the same locations and sampling depths where PCE was detected in soil gas in relatively high concentrations by GZA. Based on a review of the available data, six locations where PCE was detected in soil gas at the highest concentrations will be sampled as follows:

	Maximum PCE Concentration		
Grid Location	(mg/m^3)	(ppmv)	Sampling Depth (in)
H7	50	7	42
J8	25	4	42
I7	24	3.5	10, 12, 42
G5	22	3	16, 42
E8	20	3	42
D5	18	2.5	16, 42

These sampling locations, which are shown in Figure 1, also correspond with the locations where the highest concentrations of total VOCs were reported. Data collected from this effort will be used to extrapolate to other points on the sampling grid, as appropriate. Depending on the sampling results, if significant concentrations of vinyl chloride are detected (i.e., substantially above one ppm), a second round of sampling that is more comprehensive in scope may be proposed.[2]

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[1]The term "significant" is used to indicate the need for further sampling, and is not intended to indicate the need for remedial action.

[2]The significance of the results of the first phase of sampling in terms of decisions on further sampling will be discussed following a review of the results of the initial sampling.

C. Data Table Report

The analytical results (including QA/QC information) will be summarized in a short report. Data tables will identify sample number and compound concentration. A copy of the field map will be included to relate sample number to location. Sample collection and standard QA/QC procedures will be documented in the field procedures section of the report.

D. Schedule

Envirite anticipates that sampling will be conducted approximately two weeks after USEPA's final approval of this work plan. The 10 soil gas samples will be collected over a period of a single day. Envirite will notify USEPA at least one week prior to implementing this plan.

Within 90 days of USEPA approving this work plan, Envirite will submit to USEPA a letter report summarizing the results of this project. In addition to being summarized in a letter report, results of this project will be included in both the RFI Supplement and final PHERE, as required by the Consent Order.

II. SAMPLING PROTOCOL

This section describes the procedures that will be used for collection and analysis of soil gas samples, including a brief description of quality assurance and quality control (QA/QC) protocols.

A. Sampling and Analysis Procedures

Sampling will be conducted by Target Environmental Services, Inc., under the direction of ENVIRON Corporation. Upon arrival at the site, the sampling team will check the site map for accuracy, identify the predetermined sampling locations, and mark each location with a pin flag or paint. The sampling equipment will be purged with bottled nitrogen or ambient air filtered through a dust and organic vapor cartridge.

At each location, a 1/2" diameter hole will be made to the sampling depth by using a slide hammer (1/2" in diameter steel rod with a sliding weight attached to one end, the rod is driven into the ground by a reciprocating motion manually applied to the weight). A 1/2" diameter stainless steel probe will be inserted to the full depth of the hole and sealed off from the atmosphere using a biodegradable inert sealant. Samples of soil gas will then be drawn from the prescribed depth by a manual syringe pump, and collected as described below.

In a two-step process, a consistent volume of *in situ* soil gas vapor will be withdrawn and encapsulated in a pre-evacuated, EPA-clean glass vial at 2 atmospheres (15 psig) pressure. The two-step sampling procedure allows for an initial gas draw to fully "charge" the sampling apparatus with soil gas, and remove all purge gases from the system. The second draw, then, produces a truly representative soil gas sample. Small consistent volumes of extracted soil gas help to ensure consistent sampling of *in situ* vapors.

Following collection, the sample will be labeled and stored in a dark container pending analysis. The interior surfaces of all sample handling equipment and storage containers are stainless steel, teflon, and/or EPA-clean glass. The samples will be returned to an analytical laboratory the same day they are obtained. Samples will be analyzed on a gas chromatograph/mass spectroscopy (GC/MS) system. Standards will be analyzed in order to quantify vinyl chloride to a detection limit of 0.2 ppm and perchloroethylene to a detection limit of 0.15 ppm.

All of the equipment required by the sampling procedure is portable. No vehicular access to the sample location is necessary. No heavy equipment will be used. Disturbance to activities and properties in the sample area is minimal.

B. Quality Assurance and Quality Control Procedures

The following procedures will be followed to ensure and measure the accuracy and precision of the sample collection and analytical procedures:

1. Assurance of Sampling Quality

Sampling probes and apparatus are decontaminated internally and externally prior to each day's sample collection, and at additional intervals as judged appropriate by the sampling team.

INITIAL DECONTAMINATION PROCEDURES

Slide Hammer or Drive Pipe

1. The bar or pipe is washed with a Contrad cleaner/distilled water solution, and wiped dry with clean paper towels.
2. The bar or pipe is rinsed with distilled water and then wiped dry with clean paper towels.

Sampling Probe

1. The exterior of the probe is washed with Contrad/distilled water, and scrubbed with clean paper towels.
2. The exterior of the probe is rinsed with distilled water and wiped with clean paper towels.
3. The interior of the probe is flushed with Contrad/distilled water and purged for approximately 30 seconds with 20 psi of ultra-zero grade air, prepurified nitrogen, or filtered ambient air.

CONTINUAL DECONTAMINATION PROCEDURES

Sampling Probe and Apparatus

1. The sampling probes and apparatus (including valves and injection needle) are purged with a volume of filtered ambient air approximately 70 times the void space volume of the sampling system prior to each sample extraction.
2. The sampling apparatus is then purged with *in situ* soil gas approximately 25 void space volumes of the sampling system. This *in situ* soil gas, which is withdrawn through the probe and used to purge the filtered air from the sampling equipment, is then vented to the atmosphere.

2. Control of Sampling Quality

Field control samples are collected by drawing prepurified nitrogen or ambient air (filtered through an MSA organic cartridge filter) through the sampling apparatus and probe at the following times:

- prior to each day's sampling activities
- at the conclusion of each sampling day

These field control samples are labeled and analyzed in the same manner as the actual field samples and are visually indistinguishable from them.

3. Assurance of Analytical Quality

Each sample is encapsulated in a pre-evacuated EPA-clean glass vial, pressurized to 2 atmospheres (15 psig), and transported to the laboratory in an opaque protective container at ambient temperature. Samples are logged on a Chain of Custody form, which accompanies the samples during transport to the analytical laboratory. All samples are analyzed using a laboratory-grade gas chromatograph in a climate-controlled environment.

Calibration curves include at least three points, on which a linear regression is run to determine the detector response curve. The laboratory will not analyze any samples if the correlation coefficients of any of the standardized compounds are less than 0.99. It is, therefore, safe to assume linearity of the response curve throughout the range of expected concentrations.

4. Control of Analytical Quality

Between sample injections, the syringe is heated to 60°C and flushed with UPC grade nitrogen. Standards, blanks, and duplicates are analyzed as follows:

- Analyte standards are analyzed prior to sample batch analysis and at intervals during analysis.
- Carrier gas blanks are analyzed prior to sample batch analysis and after every tenth sample.
- Duplicate analyses are run of every tenth sample analyzed.

III. HEALTH AND SAFETY

A Health and Safety Plan specific to this site will be prepared. All field personnel have successfully completed a 40-hour Health and Safety training course, fulfilling the initial training requirements as specified in 29 CFR §1910.120(e). The training policies and procedures will ensure that personnel can recognize hazards, understand emergency response procedures, and have the knowledge necessary to enable them to perform their assigned jobs in a manner that ensures employee and public safety. Annual 8-hour updates and Supervisory Courses have been completed as appropriate.

All personal protective equipment (PPE) necessary for operations under Safety Level B will be maintained, including protective suits, respirators, and self-contained breathing apparatus (SCBA). In accordance with OSHA regulations, breathing space air monitoring will be performed during sampling at this site. The necessity for an upgrade of safety level from Level D is not expected, but will be based on action levels specified in the Health and Safety Plan.