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U.S. EPA
Eastern District Office



CORPORATION

July 31, 1984

Howard Zar
U.S. EPA 5WQ-11
230 S. Dearborne St.
Chicago, IL 60604

Dear Howard:

I have enclosed three copies of the Tier 7 Sampling Plan, the draft forms of the pamphlet and other literature provided by Headquarters and a copy of the proposed budget.

Copies of the Sampling Plan were sent to Gary Amendola and Steve Kroner (EPA Headquarters). I have notified both the SCC and the Central Sample Container Repository regarding the possibility of sampling next week.

Should any problems arise regarding the Sampling Plan, please contact Bob Schaffer in my absence.

Sincerely,

Edward D. Handel
Manager, Measurement Systems

EDH/sh

Enclosure



CORPORATION

BUDGET FOR TIER 7 SAMPLING IN REGION 5

TASK	HRS	RATE	TOTAL
LABOR:			
PROJECT MANAGMENT	40	60.00	2,400
SAMPLING - 10 MAN-WEEKS	400	30.00	12,000
TRIP REPORT	40	45.00	1,800
PROJECT ADMINISTRATION	20	60.00	1,200
ODC:			
AIR TRAVEL (PER PERSON PER TRIP)			
5 TRIPS X 2 PERSONS X \$400.00			4,000
CAR RENTAL			
5 WEEKS X \$200.00			1,000
PER DIEM EXPENSES, 10-MAN-WEEKS X \$500.00			5,000
SAMPLE STORAGE AND MISC EXPENDABLE SUPPLIES			2,000
GRAND TOTAL			29,400

DISPOSAL AND HANDLING FEE FOR DISPOSABLE EQUIPMENT AND SUPPLIES WILL BE AVAILABLE AT A PRICE NOT TO EXCEED \$500.00 PER 55 GAL DRUM. ONLY SOILD WASTE WILL ACCEPTED. *This applies to Tier 3 and 6 materials.*

Edward J. Hall

NATIONAL DIOXIN STUDY
REGION 5
TIER 7: SAMPLING PLAN

JULY 30, 1984

TIER 7 SAMPLING PLAN

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- 1.0 Project Name: Region V: Tier 7 Investigation - Soil.
- 2.0 Project Requested by: U.S. EPA, as part of EPA's National Dioxin Survey.
- 3.0 Period of Project Performance: July 1984 - September 1984.
- 4.0 Regional Project Coordinator: Howard Zar (312/886-0150)
- 5.0 Regional Quality Assurance Officer: Howard Zar
- 6.0 Contractor: CENTEC Corporation
11260 Roger Bacon Dr.
Reston, VA 22090
Attn: Ted Handel, Ph.D. (703/471-6300)

7.0 Project Description

7.1 Tier 7 Sampling Protocols

Tier 7 consists of areas where no known or suspected sources of 2,3,7,8-TCDD contamination are located. The basic goal of the Tier 7 study is to evaluate the extent and severity of 2,3,7,8-TCDD contamination in the environment in order to establish background levels. In addressing this goal, phase I of this study will focus on soil contamination.

The specific objective of this study is to determine the percentage of sites in the EPA Urban and Rural Networks that have measurable levels of 2,3,7,8-TCDD in the soil. These networks were established to provide a statistical basis for monitoring pesticide residues in the environment. If 2,3,7,8-TCDD is detected at a significant number of locations, the EPA will attempt to quantify these background levels and to determine their sources. Analyses of soil samples at Tier 7 sites will be performed at approximately a level of detection of one part per trillion (ppt).

Soil collection procedures at rural and urban Tier 7 sites are identical to those for Tiers 3, 5 and 6. In this way, a valid data base is created from which comparisons among the tiers can be performed.

The major differences between the tiers is that Tier 7 limits the number of samples to one sample for each site. At designated sampling sites for urban sampling, one discrete sample should be taken at the mid-point of the site. At designated rural 10-acre sites, the area should be divided into equal sized grids (not exceeding 50' x 50') from which one grid should be randomly selected. A single discrete sample should be taken from the mid-point of the chosen grid.

7.2 Rural Sites: Engineering Grid System

An engineering grid system will be used to facilitate sampling rural 10-acre sites using the random sampling approach. The sampling team will locate the general vicinity of the site using the assistance of county officials, such as the county health official or the district soil conservation agent, USGS 7 1/2 minute maps, and the county map, drawings and aerial photographs provided by EPA from the Soils Networks.

At the site, bearings will be obtained by locating specific landmarks noted in the provided site materials. For the purpose of this study, an engineering drawing will be prepared of the site using a 50' x 50' grid system. A corner of the site will first be unequivocally identified by establishing directions and distances from several permanent nearby landmarks such as intersections, roads, fencelines, section markers, large trees or buildings. This corner will be marked with a stake. This corner will then be marked on the site map allowing room for the marking of the reference landmarks. Distances will be measured using a tape measure or rangefinder. Distances should be measured with accuracy to the nearest foot. Direction will be measured with a field siting compass accurate to the nearest degree. Specially prepared drafting paper with an engineering grid system will be used for the site map preparation. Each grid will normally represent a 50' x 50' grid.

The perimeter of the site will then be defined using a rangefinder and compass. Each boundary will be related to prominent landmarks. Each corner will be marked with a stake. The boundary line will be marked on the site map. A flag man will walk to an adjacent corner of the site. A second person with the rangefinder and compass will focus on the marker flag in order to establish distance. He will note distance and magnetic heading on the site drawing for each boundary. In the event that visual obstructions exist along a border, several sightings may be necessary. In this case, each flag position will be marked with a stake and indicated on the map with an "X", a heading and a distance. In this way true headings may more easily be obtained. All borders of the site perimeter will be determined in this manner. Prominent landmarks within the site will then be shown in their proper location on the map. Magnetic North will be indicated on the site map using an arrow pointing in the North direction. Each map must contain the following information: city or county, state, name of owner, sampling date, site number and name of sampling team captain.

Each grid on the map will be consecutively numbered beginning with 1. One grid will be randomly selected using either a calculator with a random number generator or by using statistical random number tables. The corners of this grid will be located using the rangefinder (or tape measure) and compass. The corners will be marked with stakes. The selected grid will be clearly identified on the site map. The site will be documented by noting distance and direction of nearby prominent landmarks from the corner stakes. Care will be taken to avoid disturbing the center location of the site prior to taking the sample. The site will be further documented by a series of photographs taken using an autofocus 35mm camera capable of electronically providing a date and time on each picture. A large placard will be prepared with site number and location indicated. This will be included in the photo-documentation of each site. Photographs taken will include prominent landmarks where possible. The direction of the photographs will be indicated on the site map. The site documentation will be recorded in a permanently bound field notebook.

7.3 Urban Sites

Urban sites will be sampled at their mid-point. Site maps will be prepared, accurately describing the site borders with reference to prominent landmarks in such a manner as to enable the unequivocal identification of the site and its mid-point. The site corners will be marked with stakes and the site will be documented with photographs in the same manner as described for rural sites.

7.4 Sample Collection

Soil samples will be taken at the mid-point of the site (located as described above). Prior to sampling, grass will be trimmed to just above soil surface. Samples will be taken using a new tulip bulb planter for each site. The tulip bulb planter will be forced into the ground to a depth of 4 inches. The soil will be placed in a new disposable aluminum pan. Sufficient cores will be taken to fill the sample container one-half full. Stones, twigs and other debris will be removed from the soil using clean tweezers. The soil sample will then be transferred to the 1-quart sample container. The container will be sealed with a tamper-proof seal and will be labeled with the sample identification number. The tulip bulb planter, tweezers and aluminum pan will be placed in a plastic bag. These materials will be removed from the site and will be properly disposed of by the sampling team. The lawn will be repaired using locally obtained topsoil and sod.

7.5 Sample Shipment

The sample container will be labeled with a unique sample number provided by the Sample Control Center (SCC). A Sample Tag (Fig 1) will be prepared and attached to the container. The container will be sealed with an EPA Custody Seal (Fig 1). The sample will then be logged on a Chain of Custody form (Fig 2). The sample container will be placed in a plastic bag. The bag will be sealed with a twist tie and placed in the shipping box and packed with peanuts.

A Batch of samples will be defined as the number of samples collected during a week by one sampling team, or, if as in the case of urban sampling more than 12 samples are collected, two or more batches will be defined grouped chronologically. A Batch will include up to 12 environmental samples, one duplicate, one field blank and one Performance Evaluation (PE) soil. Since the field blanks and PE soils are not yet available, the environmental samples will be shipped to a temporary storage facility. CENTEC Analytical Services, located in Salem Virginia, will provide secured storage of these samples until the Batch can be completed with appropriate blank and PE soils. Storage will be in original shipping containers in a cool, dark, locked room. Upon receipt of the PE and Blank soils, assigned laboratory personnel will assign specified sample numbers, complete the Chain of Custody forms and the Dioxin Shipment Record (Fig 3) and arrange shipping to the specified TROIKA facility for analysis. CENTEC will notify the SCC and the TROIKA Laboratory of the shipping details.

The shipping box will be sealed and marked as follows:

1. Affix a label with complete laboratory address and the name of the responsible person at the laboratory
2. Affix a completed shipping label (e.g. Federal Express)
3. Mark side of box with number of samples in box, box volume and weight
4. Mark box number in batch, eg, "1 of 2"
5. The Chain-of-Custody Form and Dioxin Shipment Record (parts 4 and 5) will be enclosed with each shipment

Prior to initiating each sampling episode, the Sample Control Center will be notified so that they can prepare for sample receipt. Immediately after shipment, the laboratory will be contacted and the following information relayed:

1. Number of samples
2. Name of carrier
3. Airbill numbers
4. Number of boxes in shipment
5. Date and time shipment sent
6. Estimated date and time of delivery
7. Any problems relating to shipment

The above information should also be recorded in a bound notebook. Part 3 of the Dioxin Shipment Record will be kept with the sampling records. Part 1 of the Dioxin Shipment Record will be sent to the Sample Control Center and Part 2 will be sent to the Sample Management Office if part per billion (ppb) level analyses is required.

8.0 Safety and Public Relations

The sites sampled in this study are not suspected to be contaminated with dioxin. In order to conduct this effort without unnecessarily distressing and confusing the public, the following procedures will be followed. The Region V Office will identify and notify all public officials who must and who should be informed about the nature and details of the sampling. It is recognized that the officials who wish to be informed will vary from area to area.

The CENTEC Sampling Team will identify the local officials who should be contacted. Generally the County Public Health Officer and/or the County Soil Conservation Agent will be contacted. If questions and confusion in the public is aroused during sampling, it is expected that these county officials will be contacted first by concerned citizens. In addition, these officials could be extremely valuable in assisting the sampling team in identifying the location of the site and locating the owner in order to obtain permission to sample. It is likely that they would be willing to assist the sampling team in many cases.

Any public relations problems will be promptly reported to Howard Zar at EPA Region V Headquarters and Ted Handel at CENTEC. The sampling team will await further instructions prior to resumption of any sampling related activities.

Customary safety procedures will be observed throughout this project. Sampling team members will wear standard work clothing including full length work pants (no shorts or cut-offs), a work shirt and leather work boots. Sampling team members will wear a clean pair of disposable neoprene

gloves while collecting and handling the sample. Sampling team members will not eat, drink or smoke at the site and will thoroughly wash with soap and water prior to performing these activities. At the end of a work day each sampling team member will brush all exterior clothing to remove dust. At the motel, each sampler will take a shower as soon as possible. All sampling equipment and supplies will be retained by the sampling team. In no case will any supplies be disposed locally. The closest medical services will be identified in the event of illness or injury. Each team will be equipped with a First Aid Kit including a Snake Bite Kit.

Any medical emergency will be promptly reported to Howard Zar at EPA Region V Headquarters and Ted Handel at CENTEC.

9.0 Materials and Supplies

- Sampling Kit (from Versar)
 - Sample containers
 - Sample labels
 - Shipping materials
 - plastic bag
 - Cardboard shipping carton
 - Styrofoam peanuts
 - Shipping Label
 - Packing List Pouch
 - Federal Express Form
 - Strapping tape
 - Tulip bulb planters (one planter will be used for each sample - if necessary CENTEC will supply additional planters)
- Maps with sampling locations marked
- USGS 7.5 minute area maps
- Hammer
- Stakes
- Sighting compass (+/- 1 degree)
- Measuring Tape
- Optical rangefinder (+/- 1 foot)
- Sighting flag
- Map drawing materials
- Erasable placard and marking pens
- 35mm Autofocus Date-back camera
- Film
- Neoprene gloves
- Scissors
- Disposable aluminum foil pans
- Disposable tweezers
- Garbage bags
- 15-gal recovery drum for disposal of garbage bag containing used tulip bulb planter, aluminum pan, tweezers, gloves, paper towels
- Clean water spray can
- Hand soap dispenser
- Paper towels
- Speedi-dri for waste water
- Marking pens and pencils
- Bound field sampling logbook
- Dioxin shipment record forms (from region)

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- Chain of custody forms (from region)
- Tamper-proof seals (from region)
- Backup supply of shipping materials normally supplied in Sample Kit
- Federal Express Directory
- Public relation materials (from region)
- Sampling supplies checklist
- Sample site location checklist
- Sample selection/documentation checklist
- Sample collection checklist
- Sample shipping checklist

10.0 Project Schedule and Responsibilities

National Dioxin Study Responsibility: Steven Schatzow, Dir. DWRS

Region V Dioxin Study Coordinator: Howard Zar

CENTEC National Dioxin Survey Coordinator: Ted Handel, Ph.D.

Sample Control Center (SCC): Jim King, VIAR

Central Sample Container Repository (CSCR): Gary Hacker, Versar

Activity -----	Responsibility -----
Prepare Tier 7 Sampling Plan	CENTEC
Approve Sampling Plan	Region V & DWRS
Schedule Sampling	SCC
Inform CENTEC of Laboratory to ship to:	SCC
Supply CENTEC with sample kits	CSCR
Supply CENTEC with PE and Field Blank soils	Region V
Supply CENTEC with Chain-of-custody forms	Region V
Supply CENTEC with Dioxin Shipping Report form	Region V
Pre-notification of State & Federal Officials	Region V
Notification of local officials/property owners	CENTEC
Sample Collection & Shipment	CENTEC
Sample Analysis	TROIKA
Sampling Trip Report	CENTEC

Tentative Sampling Schedule:

August 6 through August 10, 1984 (1 team of 2 people)
 4 rural sites in Ohio: Meigs, Preble, Sandusky, Whitley counties

- 4 field samples - soil (ppt)
- 1 duplicate
- 1 field blank
- 1 PE sample (ppt)

August 13-17, 1984 (3 teams of 2 people)
 15 urban sites in Gary, Indiana

- 15 field samples - soil (ppt)
- 2 duplicates
- 2 field blanks

2 PE samples (ppt)

13 urban sites in Springfield, Illinois

13 field samples - soil (ppt)

2 duplicates

2 field blanks

2 PE samples (ppt)

4 rural sites in Illinois: Christian, Shelby, Sangamon, Hancock counties.

4 field samples - soil (ppt)

1 duplicate

1 field blank

1 PE sample (ppt)

August 20-24, 1984

(1 team of 2 people)

1 rural site in Wisconsin: Washara county

2 rural sites in Minnesota: Hennepin and Watowan counties

1 rural site in Michigan: Presque Isle county

4 field samples - soil (ppt)

1 duplicate

1 field blank

1 PE sample (ppt)

11.0 Trip Reports

CENTEC will prepare written weekly trip reports providing complete documentation of all sampling. These reports will be submitted to the Region V Dioxin Study Coordinator within two weeks of completion of each sampling episode. CENTEC will prepare a bound report documenting sampling protocols, site documentation, quality assurance and safety procedures together with the weekly trip reports.

DRAFT

Project Code	Station No.	Month/Day/Year	Time	Designate:	Grab	Comp.	Preservative: Yes ☐ No ☐	
							ANALYSES	
Station Location	Samplers (Signatures)	BOD		Anions				
		Solids		(TSS) (TDS) (SS)				
		COD, TOC, Nutrients						
		Phenolics						
		Mercury						
		Metals						
		Cyanide						
		Oil and Grease						
		Organics GC/MS						
		Priority Pollutants						
		Volatile Organics						
		Pesticides						
		Mutagenicity						
		Bacteriology						
		Remarks:						
Tag No.		Lab Sample No.						
10502								

Sample Tag

CUSTODY SEAL Date _____ Signature _____			CUSTODY SEAL
			Date ..
			Signature

CHAIN OF CUSTODY RECORD

[illegible]

