United States Environmental Protection Agency

Office of Research and Development

National Human Exposure Assessment Survey (NHEXAS)

Region 5 Study

Quality Systems and Implementation Plan for Human Exposure Assessment

Research Triangle Institute
Research Triangle Park, NC 27079

Cooperative Agreement CR 821902

Field Operations Protocol **EOHSI-AP-209-021**

Title: Soil/Street Sampling Workplan

Source: Environmental and Occupational Health Sciences Institute

U.S. Environmental Protection Agency
Office of Research and Development
Human Exposure & Atmospheric Sciences Division
Human Exposure Research Branch

FIELD OPERATIONS PROTOCOL	RESEARCH TRIANGLE INSTITUTE POST OFFICE BOX 12194 RESEARCH TRIANGLE PARK, NC 27709-2194	EOHSI-AP-209-021 Page 1 of 9

TITLE: SOIL/STREET SAMPLING WORKPLAN

SOURCE: Environmental and Occupational Health Sciences Institute
Post Office Box 1179
681 Frelinghuysen Road
Piscataway, NJ 08855-1179

AUTHOR(s):

Sabadie Fademan for Tom Wallace Date: 5/12/95

_____ Date: _____

_____ Date: _____

APPROVED BY:

Principal Investigator: _____ Date: 5/15/95

QA Officer: _____ Date: 5/15/95

STATUS:	IN PROGRESS:	☐
	DRAFT:	☐
	FINAL VERSION:	☒

REVISIONS:

No.	Date	No.	Date
0	‡	6	
1		7	
2		8	
3		9	
4		10	
5		11	

‡ Effective date of this version is the date of the last approval signature; revision 0 is the original version.

SOIL/SWEEP DUST SAMPLING

TABLE OF CONTENTS

1.0 SCOPE AND APPLICATION

The pollutants selected as the public health issues for the NHEXAS pilot study include Pb and As. Soils present a source of exposure through dermal contact and ingestion in the indoor environment, as a component of housedust, as well as the outdoor environment. Sampling will be conducted to determine the concentration of these contaminants in the soils and/or sweep dust adjacent to 50 of the homes.

All analytical and sample information will be assembled and returned to RTI for inclusion within the database for the entire pilot study. The data will eventually be returned to EOHSI for use in the pilot study exposure assessment.

2.0 SAMPLE COLLECTION OVERVIEW

Whenever possible, one sweep dust and one soil sample will be collected from each of the 50 homes selected. At least one of these samples should be collected from each home selected for this type of sampling. The sampling locations to be targeted for soil are the primary outdoor activity area or the front of the building where the participants reside. The sampling location targeted for sweep dust collection is the primary entryway to the building. The samples will be collected as outlined below. All data relevant to each sample will be maintained in the data collection record. A custody record will accompany each sample throughout its processing. Samples will be labeled to ensure proper identification.

3.0 SAMPLE COLLECTION MATERIALS AND SYSTEMS

<u>Soil/Sweep Dust Sampling Equipment List</u>

1. PVC soil sample collection rings
2. Polyethylene soil sample collection plates
3. Soil sample custody records
4. Sample collection bags
5. Hand brooms
6. Polypropylene sweep dust collection scoops

7. Sweep dust sample custody records

4.0 PREPARATION OF MATERIALS

Soil and sweep dust sampling apparatus will be washed in 10% nitric acid, rinsed in deionized water and air dried at EOHSI prior to being shipped to the field. After the initial use, the sampling apparatus will have to be rewashed in the field or returned to the laboratory for washing prior to subsequent use in accordance with the standard operating procedure for cleaning sampling apparatus.

5.0 SAMPLE COLLECTION

Whenever possible, one sweep dust and one soil sample will be collected from each of the 50 homes selected. At least one of these samples, one sweep or one soil, should be collected from each home selected for sampling. If no soil exists on the property, then two sweep samples should be collected if possible. If no areas are available for sweeping, then two soil samples should be collected if possible. Neither soil nor sweep dust samples will be collected if the ground is wet, muddy or frozen. The field technicians will identify the location of the primary outdoor activity area (OAA) through interviews with the participants. If possible, a soil sample will be collected from this area following the standard operating procedure for soil sample collection. The field technicians will also identify the primary entryway to the residence. If possible, one sweep dust sample will be collected at the identified primary entryway in accordance with the standard operating procedure for sweep dust collection.

6.0 SAMPLE STORAGE AND SHIPMENT

Samples will be stored in a refrigerator or on ice at a temperature of 0 to 6 degrees Centigrade after they are returned to the field staging area. The samples should be shipped within 10 days to EOHSI for analysis. Samples do not have to be refrigerated during

shipment. Upon arrival at EOHSI the samples will be refrigerated until they are prepared for analysis.

7.0 QA/QC PROCEDURES

1. Each sample will be assigned a unique sample ID which will conform to the NHEXAS coding scheme.
2. A standard operating procedure will be followed for collecting the soil samples.
4. All sample collection apparatus will be cleaned prior to implementation in the field in accordance with the standard operating procedure for sampling apparatus.
5. All samples will be labeled to ensure proper identification.
6. All data relevant to the collection of the sample will be recorded.
7. A custody record will accompany each sample throughout its collection, handling, and analysis.
8. Ten percent of the field samples will be "split" samples and will serve as duplicates for this study. A SAS™ Uniform Random Number Generator will be used to identify the "split" samples.

STANDARD OPERATING PROCEDURE

CLEANING THE SOIL SAMPLING APPARATUS

1. Soak the samplers in deionized water for a minimum of 1 hour.
2. Scrub the samplers with a clean bristle brush (a new toothbrush will do) to remove any dirt.
3. Rinse the samplers with deionized water.
4. Allow samplers to dry in a clean, dry environment.

STANDARD OPERATING PROCEDURE

SOIL SAMPLING

1. Field technicians will identify the location of the primary outdoor activity area (OAA) through interviews with the participants. The location from which the sample is collected should meet the following criteria:
   a. The location should be an area of activity such as a child's play area or garden area.
   b. The soil should be exposed and available for human contact.

   If there is no location which meets these criteria then do not collect a soil sample.

2. The sampling location should be noted in the sample collection record or an addendum to the record.

3. Take a PVC soil collection ring and embed it into the soil with the bevelled edge facing down. Twisting the ring may help embed it in the soil. The flat polyethylene plate may be used to push down on top of the ring.

4. Slide a polyethylene plate underneath the collection ring, entrapping the soil within the ring's boundary.

5. Lift the plate and the ring from the ground and deposit the soil in the plastic collection bag.

6. If it is not possible to use the ring, the surface can be scraped using the polyethylene plate to collect the top half inch of the soil. A few grams of soil is sufficient for analysis. Place the soil in a labelled collection bag.

7. Review the data collection record.

STANDARD OPERATING PROCEDURE
PRIMARY ENTRY/SWEEP DUST SAMPLING

1. Whenever possible the sweep dust sample should be collected near the main entrance of the home. For a private residence this will involve sweeping an area of the porch, stoop, stairs or sidewalk adjacent to the entrance. For an apartment, this will involve sweeping an area of the hallway outside of the entrance. If a doormat is present, the sample will be collected adjacent to the doormat.

2. Approximately 1 gram of dust should be collected per sample. If a sample is designated as a split sample, approximately 2 grams should be collected.

3. Take a new dust collection brush and use it to sweep the dust from the desired area onto a polypropylene collection scoop. A template to demarcate the area may be used if desired.

4. Carefully pour the dust into a labelled polyethylene collection bag.

5. The sampling location should be noted in the sample collection record or an addendum to the record.

6. Complete the data collection record.

I. Sample Identification

Sample ID: _____

II. Sampling

Sample collected by: _____ Date: ___/___/___

Sample transported by: _____ Date: ___/___/___

Sample received/stored by: _____ Date: ___/___/___

III. Post Sampling

Sample relinquished by: _____ Date: ___/___/___

Sample sent to: _____

Shipper: _____

IV. Analytical

Analytical method: _____

Analysis performed by: _____ Date: ___/___/___

Figure 1. Information to be collected on the soil/sweep dust sample custody record.