

The Arizona Border Study

*An Extension of the
Arizona National Human Exposure Assessment Survey (NHEXAS) Study
Sponsored by the Environmental Health Workgroup of the Border XXI Program*

Quality Systems and Implementation Plan for Human Exposure Assessment

The University of Arizona
Tucson, Arizona 85721

Cooperative Agreement CR 824719

Standard Operating Procedure

SOP-UA-F-26.0

Title: Collection, Storage, and Shipment of Human Hair

Source: The University of Arizona

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

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Collection, Storage, and Shipment of Human Hair

1.0 PURPOSE AND APPLICABILITY

The procedures in this SOP describe how to collect, store, and ship human hair for analysis of mercury for the AZ Border Project and other Health and Environment projects. This SOP provides a brief description of the sample containers, collection, storage, shipping and custody procedures.

2.0 DEFINITIONS

- 2.1 **AZ BORDER** = The US border region is defined as 100 km north of the border. In this study, we define the border as 40 km north of the border. The Arizona Border Study or "Border AZ" is an alias for "Total Human Exposure in Arizona: A Comparison of the Border Communities and the State" conducted in Arizona by the University of Arizona / Battelle / Illinois Institute of Technology Consortium.
- 2.2 **BUCKET** = A plastic container with a buckle top. One bucket is assigned to each household to be visited. Household identification and stage numbers are listed on the outside of the container. The bucket contains all paperwork to be completed by field staff or household respondents. It serves as the primary vehicle for securing and transporting forms, data, and room temperature samples to and from the field.
- 2.3 **CHAIN OF CUSTODY RECORD** = A vital data tracking and quality assurance form that accompanies every sample with an already generated Sample Identification Number assigned to it by the Materials Technician.
- 2.4 **FIELD COORDINATOR** = The employee of the research project who supervises field data collection and operations. The field coordinator collates individual data into HH packets, and upon completion of all visits, sampling and QA checks, forwards the packet to the Data Coordinator.
- 2.5 **FIELD STAFF** = The Field Coordinator, the Team Leader and the Team Members.
- 2.6 **HOUSEHOLD (HH)** = The residence occupied by study respondents.
- 2.7 **HUMAN HAIR COLLECTION SHEET AND CHAIN OF CUSTODY RECORD (Fig. 1)** = A form containing sampling/collection information and the chain of custody record.
- 2.8 **MATERIALS TECHNICIAN (Materials tech)** = The employee of the research project who is responsible for assembling and assigning field forms, questionnaires and equipment for field use.

- 2.9 NHEXAS ARIZONA = Acronym for National Human Exposure Assessment Survey, a research project conducted in Arizona by the University of Arizona/Battelle/Illinois Institute of Technology Consortium.
- 2.10 QUALITY ASSURANCE (QA) = All those planned and systematic actions for ensuring the accuracy, validity, integrity, preservation and utility of collected data.
- 2.11 QUALITY CONTROL (QC) = Those quality assurance actions providing a means to control and measure the characteristics of a datum, process or the adherence to established parameters.
- 2.12 RESPONDENT = A person in the study population of AZ Border Project or other Health and Environment projects. Each household is assigned an HHID. All respondents are assigned an Individual Respondent Number (IRN). Each respondent can be uniquely identified by an HHID, IRN combination.
- 2.13 SAMPLE = An aliquot of an unknown substance collected from the household for chemical analysis and identification.
- 2.14 SAMPLE KIT = Kit that contains safety equipment (gloves, goggles, dust mask), collection materials (drip tray containers, plastic spoons, disposable pipettes), field collection sheets, pair of scissors. This kit contains all materials for field collection of unknown pesticides.
- 2.15 SAMPLE IDENTIFICATION NUMBER = A numeric code that uniquely identifies every sample. It is generated through the NHEXAS tracking system by the Materials Technician.
- 2.16 TEAM LEADER = The member of the field team who is primarily responsible for respondent contact, data collection, field form and questionnaire completion, and site QC checks of all data.
- 2.17 TEAM MEMBER = Member of a field team responsible for assisting the Team Leader in the collection of data and quality control checks in the field.
- 2.18 TRACKING SYSTEM = A database system containing information about the custody, transfer and storage of hard copy data, electronic data, field samples, and field sample aliquot.
- 2.19 VISIT = A scheduled appointment with participating respondents at their place of residence (HH) for the collection of samples, questionnaires and other data.

3.0 REFERENCES

None

4.0 DISCUSSION

Although hair collection is not physically unsafe for the participating respondents, they may feel anxiety about possible changes in their appearance. The Field Staff should be sensitive to respondent's concerns and should confirm that the respondent understands the sampling procedure and gives consent immediately prior to hair collection.

5.0 RESPONSIBILITIES

5.1 The Field Coordinator is responsible for:

- (a) knowing the procedures described in this SOP and insuring that they are followed by the Field Staff,
- (b) supervising the collection of human hair samples in one out of every ten houses sampled as a field audit for QA,
- (c) coordinating with the Materials Technician to insure that human hair sample containers have been logged into the Tracking System and assigned to HH as appropriate,
- (d) QA checks of the Human Hair Collection Data Sheet and Chain of Custody Record (Fig. 1.) within 24 hours of collection.

5.2 The Team Leader is responsible for:

- (a) knowing the procedures described in this SOP and insuring that they are followed by the Team Members,
- (b) arranging sampling dates and times with the HH,
- (c) obtaining the sample containers from the Materials Technician,
- (d) insuring the integrity and custody of the sample and field forms collected,
- (e) quality control (QC) checks in the field
- (f) properly storing the samples in the dark at 4°C to and from the Field site in a cooler,
- (g) forwarding individual QC checked field forms to the Field Coordinator for QA check within 24 hours of collection.

5.3 All Team Member(s) are responsible for:

- (a) knowing and following the procedures described in this SOP
- (b) receiving the sample containers from the Team Leader,
- (c) obtaining the samples according to this SOP,
- (d) completing the Human Hair Collection Data Sheet and Chain of Custody Record,

- (e) quality control (QC) checks in the field.

5.4 The Materials Technician is responsible for:

- (a) the proper assignment of sample containers to selected HH,
- (b) accepting custody of the sample containers from the Team Leader and annotating the receipt in the Human Hair Collection Data Sheet and Chain of Custody Record that accompanies the sample,
- (c) properly storing the sample containers in the dark at - 20 °C after receipt,
- (d) stocking the HH bucket with appropriate field sampling forms,
- (e) transferring the samples to the University of Arizona Lab coordinator.

6.0 MATERIALS AND EQUIPMENT

6.1 Materials:

- (a) sample containers (Ziploc bags)
- (b) scissors
- (c) latex gloves
- (d) ice chest with blue ice cold packs, labeled and dedicated to human hair samples
- (e) Two preprinted bar code labels

6.2 Reagents: None

7.0 PROCEDURE

7.1 Preparation

7.1.1 Identify participating respondents.

7.1.2 Confirm that the respondent understands and consents to the sample collection.

7.2 Sample collection

- a. Don a pair of disposable latex gloves.
- b. The sample should be collected no higher than 1 cm (0.39 inches) above the hair line and no further than 7.5 cm (2.93 inches) across the neck.
- c. Trim the nape hair (described above in b.) to a length of 2.5 cm (1 inch).
- d. Remove approximately 1 gram of hair from the occipital region of the head (nape of the neck) using the scissors. Transfer the sample to a Ziploc storage bag.

- e. Remove gloves and dispose in a trash receptacle.
- f. Place one preprinted bar code label on the sample container.
- g. Place one preprinted bar code label on the field form (Fig. 1.).

7.3 Sample Storage

7.3.1 Field transport: Place each sample in the ice chest with blue ice cold packs.

7.3.2 For storage in field office: Freeze at - 20 °C

7.3.2 The samples will be kept chilled or frozen at all times until analysis.

7.4 Sample Delivery or Shipment - N/A

7.5 Quality control

7.5.1 QA and QC duplicate/replicate sampling will not be performed.

7.5.2 Samples will be stored at - 20 °C.

8.0 RECORDS

8.1 The Human Hair Collection Data Sheet and Chain of Custody Record (Fig. 1) must be completed for all samples.

8.2 The original of the Human Hair Collection Data Sheet and Chain of Custody Record remains with the sample at all times.

8.3 A photocopy of the Human Hair Collection Data Sheet and Chain of Custody Record is retained with the household sampling packet.

Figure 1. Human Hair Collection Data Sheet and Chain of Custody Record**Human Hair Collection Data Sheet and Chain of Custody Record**

HHID# _____

Participant's IRN: _____

Participating Respondent's First Name: _____

Sample Collection Date: ____/____/____

Team Leader: _____

Human Hair ID#: _____

Comments:

Confirmation of respondent's consent:

I understand the hair sampling procedure as explained to me by the member of the Field Staff. I consent to the removal of a small sample of my hair from the back of my head at the nape of my neck. _____ (Respondent's initials)

Custody record

Relinquished or Received	Signature	Date mo /day /yr	Time	Action
[Rel] or [Rec]		____/____/____	____:____	
[Rel] or [Rec]		____/____/____	____:____	
[Rel] or [Rec]		____/____/____	____:____	
[Rel] or [Rec]		____/____/____	____:____	
[Rel] or [Rec]		____/____/____	____:____	