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-25.0**

Title: Collection, Storage, and Shipment of Unknown Substances

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Form TP-2

Collection, Storage, and Shipment of Unknown Substances

1.0 PURPOSE AND APPLICABILITY

The procedures in this SOP describe how to collect, store, and ship unknown substances for chemical analysis and identification 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 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.

2.8 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.

2.9 QUALITY ASSURANCE (QA) = All those planned and systematic actions for ensuring the accuracy, validity, integrity, preservation and utility of collected data.

2.10 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.

2.11 PESTICIDE SURVEY (Fig. 2) = This is a list of all pesticides stored at or in the HH. It is the final question attached to the Tech questionnaire.

2.12 RESPONDENT = A person in the study population of AZ Border Project or other Health and Environment projects. Each household is assigned and 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 IDENTIFICATION NUMBER = A numeric code that uniquely identifies every sample. It is generated through the NHEXAS tracking system by the Materials Technician.

2.15 SAMPLE KIT = Kit that contains safety equipment (gloves, goggles, dust mask), collection materials (drip tray containers, plastic spoons, disposable pipettes), field collection sheets. This kit contains all materials for field collection of unknown pesticides.

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 UNKNOWN SUBSTANCE = Any liquid or solid material that is identified and/or used by the respondent as a pesticide but that is not labeled with product name or chemical content or that cannot otherwise be specifically identified by the respondent.

2.20 UNKNOWN SUBSTANCES COLLECTION DATA SHEET AND CHAIN OF CUSTODY RECORD (Fig. 1) = A form containing sampling/collection information and

the chain of custody record.

2.21 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

Samples will be collected only if the substance is not labeled and the respondent cannot state the identity or source of the material. Material in an unlabeled container that is known by the respondent to have originated in another container will not be considered an unknown substance if the originating labeled container is available for inspection.

If household respondents become alarmed by the use of personal protective equipment by the Field Staff, a staff member may explain that the unknown substances are not necessarily dangerous but that the members of the Field Staff may be handling many different samples throughout the course of the study. Therefore, the use of such equipment is prudent and necessary to avoid future lawsuits.

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 identification and collection of unknown substance samples in one out of every ten houses sampled as a field audit for QA,
(c) coordinating with the Materials Technician to insure that unknown substance sample containers have been logged into the Tracking System and assigned to HH as appropriate,
(d) QA checks of the Pesticide Survey (Fig 2.) and the Unknown Substances 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) collaborating with the Team Member(s) to select appropriate substances for collection
(e) insuring the integrity and custody of the sample and field forms collected,
(f) quality control (QC) checks in the field
(g) properly storing the samples in the dark at 4°C to and from the Field site in a cooler,
(h) 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) collaborating with the Team Leader to select appropriate substances for collection
(d) obtaining the samples according to this SOP,
(e) completing the Pesticide Survey and Chain of Custody Record,
(f) 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 Unknown Substances 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) shipping the samples collected at the appropriate time to the analyzing laboratory and documenting shipment on the Chain of Custody Record and on the NHEXAS Arizona Shipment Log (Fig. 3).

6.0 MATERIALS AND EQUIPMENT

6.1 Materials:
(a) sample containers for solid materials (Ziploc bags)
(b) sample containers for liquid materials (HDPE screw-top vials, 20 mL)
(c) two preprinted sample ID bar codes for each field collection
(d) Field kit contains:
  (1) disposable, plastic sample collection spoons
  (2) plastic pan
  (3) disposable polyethylene transfer pipet
  (4) latex gloves
  (5) dust mask
  (6) safety goggles

(7) trash receptacle (hazardous materials red bag with contents label)
(8) pre-moistened towelettes

(e) ice chest with blue ice cold packs, labeled and dedicated to unknown substance samples

6.2 Reagents: None

7.0 Procedure

7.1 Preparation

7.1.1 Identifying unknown substances

Have the respondent identify pesticides or materials used as pesticides in the household. Such materials will be identified as unknown substances if the material is stored in a container that is not labeled and the respondent cannot state the identity or source of the material.

7.2 Sample collection

Caution: While pesticides intended for household use are reasonably safe and require only minimal care in handling, unknown substances must be considered potentially hazardous. Therefore, these samples must be handled with extreme care.

7.2.1 Solid (dry) Unknown Substance

a. Don a pair of disposable latex gloves, safety goggles, and a dust mask.

b. Remove the container of unknown substance from the residence to the outdoors and out of the wind.

c. Place the container in the plastic pan on the ground.

d. Open the container, transfer a teaspoonful of the substance (approximately 5 grams) to the Ziploc bag using a disposable spoon.

e. Place one preprinted bar code label, provided in the sample kit on the ziploc bag.

f. Place the other preprinted label on the field sheet.

g. Close the source container and return it to the household.

h. Remove any material spilled in the plastic pan to trash as necessary and record

each spill on the contents label.

i. Remove gloves and dust mask, place in trash and then wash hands thoroughly using pre-moistened towelettes. Dispose of towelettes in regular trash.

7.2.2 Liquid Unknown Substance

a. Don a pair of disposable latex gloves and safety goggles.

b. Remove the container of unknown substance from the residence to the outdoors.

c. Place the container in the plastic pan on ground.

d. Open the container, transfer approximately 5 mL of the material to the liquid sample container using the disposable transfer pipette.

e. Place one preprinted bar code label, provided in the sample kit on the ziploc bag.

f. Place the other preprinted label on the field sheet.

g. Close the source container and return it to the household.

h. As necessary, clean up any liquid spilled in the Nalgene pan with paper towels, remove to trash, and record each spill on the contents label.

i. Remove gloves, place in trash and then wash hands thoroughly using pre-moistened towelettes. Dispose of towelettes in regular trash.

7.3 Waste disposal

7.3.1 Return the trash receptacle and the completed contents label to the laboratory.

7.3.2 Call Risk Management for disposal.

7.4 Sample Storage

7.4.1 For transport from field: Place each sample in the ice chest with blue ice cold packs.

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

7.4.3 The sample will be kept chilled or frozen at all times until the analysis.

7.5 Sample Delivery or Shipment

7.5.1 All samples should be kept to - 20°C prior to shipping.

7.5.2 Complete the NHEXAS AZ Shipment log (Fig. 3.) and document shipment on the Unknown Substances Collection Data Sheet and Chain of Custody Record (Fig. 1.). Retain a copy of the Unknown Substances Collection Data Sheet and Chain of Custody Record and Shipment Log. Forward a second copy of the Unknown Substances Collection Data Sheet and Chain of Custody Record and Shipment Log to U.S. EPA Labs in Cincinnati. The original Unknown Substances Collection Data Sheet and Chain of Custody Record and Shipment Log remains with the sample(s).

7.5.3 Ship or transport (within 24 hours) the sample in insulated shipping containers with sufficient cold packs to maintain a sample temperature of 4°C for 24 hours.

7.5.4 For glass sample containers, wrap each container in bubble wrap or other protective cover to prevent breakage.

7.5.5 If the samples are shipped, transport using the quickest possible method conforming to all DOT (Department of Transportation) express mail packaging and shipping regulations.

7.6 Quality control

7.6.1 One sample of every 30 samples collected will be a known liquid pesticide.

7.6.2 One sample of every 30 samples collected will be a known solid pesticide.

7.6.3 One sample of every 30 samples collected will be a duplicate sample.

7.6.3 10% of all samples collected/analyzed are for QC/QA purposes.

7.6.4 Samples will be stored at - 20°C.

7.6.5 Tolerance

(a) Retain samples up to one year.

(b) Cull samples annually.

(c) Call risk management to dispose of materials.

8.0 RECORDS

8.1 The Unknown Substances Collection Data Sheet and Chain of Custody Record (Fig. 1) and Pesticide Survey (Fig.2) must be completed for all samples.

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

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

Figure 1. Unknown Substances Collection Data Sheet and Chain of Custody Record (Page 1 of 2)

Unknown Substances Collection Data Sheet and Chain of Custody Record

HHID# _____

Participant's IRN:_____

Participating Respondent's First Name: _____

Sample Collection Date: ___/___/___ Tech. ID:_____

Unknown Substance ID#: _____
(Bar code)

Sample characteristics:

Reported use of substance:

Age of substance and origin (if known):

Storage location:

Description of container (cardboard, plastic, glass; well-sealed, open to air):

Description of contents (liquid, solid, color, odor, texture, etc.):

Comments:

Respondent's release of unknown substance sample to Field Staff:

I understand that a small sample of pesticide or unknown substance will be removed from my household. I further understand that these samples will not be returned to me. _____
(Respondent's initials)

Figure 1. Unknown Substances Collection Data Sheet and Chain of Custody Record (Page 2 of 2)

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]		__/__/__	__:__	
[Rel] or [Rec]		__/__/__	__:__	
[Rel] or [Rec]		__/__/__	__:__	
[Rel] or [Rec]		__/__/__	__:__	
[Rel] or [Rec]		__/__/__	__:__	
[Rel] or [Rec]		__/__/__	__:__	
[Rel] or [Rec]		__/__/__	__:__	
[Rel] or [Rec]		__/__/__	__:__	
[Rel] or [Rec]		__/__/__	__:__	
[Rel] or [Rec]		__/__/__	__:__	

Figure 2. Pesticides Survey Form (Page 1 of 2)

Pesticide Survey

HHID | F.S. | Administration Date MO / DAY / YR | Page

Line	Container	Product Name:	Key Ingredients/ Registration Number:	Formulation:	Storage site:	Condition of Container:	Last Known Use:	Sample Collected
1				1 2 3 N M	1 2 3 4 N M	1 2 3 N M	1 2 3 N M	Y N N M
2				1 2 3	1 2 3 4	1 2 3	1 2 3	Y N
3				1 2 3	1 2 3 4	1 2 3	1 2 3	Y N
4				1 2 3	1 2 3 4	1 2 3	1 2 3	Y N
5				1 2 3	1 2 3 4	1 2 3	1 2 3	Y N
6				1 2 3	1 2 3 4	1 2 3	1 2 3	Y N
7				1 2 3	1 2 3 4	1 2 3	1 2 3	Y N
8				1 2 3	1 2 3 4	1 2 3	1 2 3	Y N

Comments: _____

51063

Code Code Code

Formulation Codes:
1) Ready to use liquid
2) Ready to use powder
3) Liquid concentrate
4) Dry concentrate
5) Aerosol spray

Storage Codes:
1) Kitchen
2) Bathroom
3) Basement
4) Attic
5) Utility room
6) Attached garage
7) Attached shop/ workshop

Container Codes:
1) Container is closed and outside is clean.
2) Container is closed and outside is soiled.
3) Container is opened.
4) Contents spilled on adjacent surfaces.
5) Mixing container (not original package)

Last known use Codes:
1) Never used.
2) Within the past week.
3) Within the past month.
4) Within the past 6 months.
5) Longer.
6) Dont know

Figure 2. Pesticides Survey Form (Page 2 of 2)

Pesticide Survey

TRMS | F.S. | Administration Date MO / DAY / YR | Page

Line	Container	Product Name	Key Ingredients/ Registration Number	Formulation	Storage site	Condition of Container	Last Known Use	Sample Collected
1				1 2 3 N M 4 5 5 6 7 O O	1 2 3 4 N M 5 6 7 O O	1 2 3 N M 4 5 6 O O	1 2 3 N M 4 5 6 O O	Y N N M O O O
2				1 2 3 4 5 5 6 7 O O	1 2 3 4 5 6 7 O O	1 2 3 4 5 6 O O	1 2 3 4 5 6 O O	Y N O O
3				1 2 3 4 5 5 6 7 O O	1 2 3 4 5 6 7 O O	1 2 3 4 5 6 O O	1 2 3 4 5 6 O O	Y N O O
4				1 2 3 4 5 5 6 7 O O	1 2 3 4 5 6 7 O O	1 2 3 4 5 6 O O	1 2 3 4 5 6 O O	Y N O O
5				1 2 3 4 5 5 6 7 O O	1 2 3 4 5 6 7 O O	1 2 3 4 5 6 O O	1 2 3 4 5 6 O O	Y N O O
6				1 2 3 4 5 5 6 7 O O	1 2 3 4 5 6 7 O O	1 2 3 4 5 6 O O	1 2 3 4 5 6 O O	Y N O O
7				1 2 3 4 5 5 6 7 O O	1 2 3 4 5 6 7 O O	1 2 3 4 5 6 O O	1 2 3 4 5 6 O O	Y N O O
8				1 2 3 4 5 5 6 7 O O	1 2 3 4 5 6 7 O O	1 2 3 4 5 6 O O	1 2 3 4 5 6 O O	Y N O O

Comments: _____

Code Code Code

51063

Formulation Codes:
1) Ready to use liquid.
2) Ready to use powder.
3) Liquid concentrate.
4) Dry concentrate.
5) Aerosol spray

Storage Codes:
1) Kitchen
2) Bathroom
3) Basement
4) Attic
5) Utility room
6) Attached garage
7) Attached shop / workshop

Container Codes:
1) Container is closed and outside is clean.
2) Container is closed and outside is soiled.
3) Container is opened.
4) Contents spilled on adjacent surfaces.
5) Mixing container (not original package)

Last known use Codes:
1) Never used.
2) Within the past week.
3) Within the past month.
4) Within the past 6 months.
5) Longer.
6) Dont know.

Figure 3. NHEXAS AZ Shipment Log.

NHEXAS Az SHIPMENT LOG

Shipment Date_____/_____/_____ Destination_____ Shipment prepared by [_____]
(mo / day / yr)

Recipient Notified of Shipment by [_____] on _____/_____/_____ comments_____
(mo / day / yr)

note: FF = field form included with shipment and CoC = chain of custody record verified and present

SAMPLE ID#	TYPE	FF	CoC	COMMENTS

FORM ID = UA-F2.0-1.0