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-C-4.0**

Title: Batching of Field Data Forms

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APPROVALS

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Form TP-1

BATCHING OF FIELD DATA FORMS

1.0 Purpose and Applicability

This procedure describes the assembly of household packets into data processing batches. The batching process enables orderly tracking of packets or forms through data processing and limits the potential for packet or form loss. This procedure will be used for the field data forms generated by NHEXAS ~~Arizona.~~ Border and Other Health & Environment Projects.

ESC 7.14.97

2.0 Definitions

2.1 BATCH CUSTODY FORM: A hard copy form serving as a tracking and custody tool for the packets or forms contained in a data processing batch. This form contains a precise description of the batch and its custody transfer history from data entry to data validation (see example in Figure 1). This form may be generated via the TRACKING DATABASE (see below).

2.2 DATA, ELECTRONIC: Data stored on some type of magnetic or optical medium (for example: floppy disk, hard disk, Bernoulli, tape).

2.3 DATA, PHYSICAL: A datum or data written on a physical data form.

2.4 DATA PROCESSING BATCH (DP BATCH): A collection of household packets or physical data forms reviewed for quality assurance and ready for data entry. Each DP batch receives a unique numeric or alphanumeric code that is written on all forms in the DP batch and is entered into the database corresponding to that form.

2.5 HOUSEHOLD: The residence occupied by study subjects.

2.6 HOUSEHOLD IDENTIFICATION (HHID) NUMBER: A unique identification number assigned to a study household. An associated letter (or extension) defines any divisions of single households into multiple units.

2.7 HRP SITE: The Health Related Professions building, located at 1435 North Fremont Avenue; Tucson, AZ 85719. This is an annex of the Respiratory Sciences Center and the primary site of operations for NHEXAS Arizona.

2.8 KEY VARIABLE(S): One or more variables in a data record or on a physical form whose value or combined values make a data record unique from the others in the same table or file.

2.9 KEYPUNCH: The primary area in which data entry and data verification of NHEXAS Arizona field data takes place. It is located in the Respiratory Sciences Center, Room 2329; Arizona Health Sciences Center (AHSC); 1501 N. Campbell Avenue; University of Arizona; Tucson, AZ 85724. Data are also entered and verified at the HRP SITE (see above).

2.10 LOGBOOK: The notebook where all documentation of the arrival and departure of individual physical forms within a household packet is kept.

2.11 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.

2.12 PACKET: A sturdy, envelope-like container that can be fully closed and is large enough to hold the physical data form(s) generated by a study household, laboratory, research site, or data processing batch. One type of packet is used for one type of physical data forms (eg., manila envelopes would be used for all lab forms processed at the HRP site). Packets are either color coded, labeled according to their contents, or both. What are referred to as "household packets" are relevant to this SOP (see PACKET, HOUSEHOLD below).

2.13 PACKET, HOUSEHOLD: A packet containing the physical data forms generated from sampling and surveying a study household.

2.14 QA = QUALITY ASSURANCE: All those planned and systematic actions necessary for ensuring the validity, integrity, preservation and retrievability of the data.

2.15 QC = QUALITY CONTROL: Those quality assurance actions providing a means to control and measure the characteristics of an item, process, or the establishment of requirements.

2.16 STUDENT DATA PROCESSING: The area of the HRP site in which one or more Student Data Assistants enter, verify, clean, validate, and QA check post-field data.

2.17 TRACKING DATABASE: A database system containing information about the custody, transfer, and storage of hard copy data, electronic data, field samples, and field sample alloquats.

3.0 References

None

4.0 Discussion

During every week of active field sampling, a DP batch will be assembled on a certain day of that week, regardless of the quantity of packets accumulated. The only exceptions to weekly batching are if (1) no completed household packets exist, or (2) completed packets were transferred to the data section, but were returned to the field section due to missing QA checks, missing forms, or unaccounted forms.

The regular formation of DP batches on a certain day of each week has two main benefits. First, it promotes quick and efficient data processing that enables us to continually update the characterization of our study population with respect to their exposure to target pollutants. This, in turn, allows us to readily determine the direction of future sampling.

The second benefit is organizational in nature. Although a DP batch

consists of data forms from various households, it is created during a specific week, year, and season of sampling. It will also often consist of households from a certain region in Arizona, as well as ones in certain sampling stages. Discrete quantities of this sort are easily recognized, tracked, sorted, and cross-checked, especially since the DP batch code is electronically entered and treated as a whole throughout data processing. For instance, if errors in key variables were detected, then the DP batch code would allow one to narrow the possibilities to the packets or forms within the same DP batch.

5.0 Responsibilities

5.1 Project Field Coordinator

5.1.1 Receives the physical data forms from the field Team Leader and performs the intermediate and final QA checks preceding data entry (See SOP#UA-C-2.0).

5.1.2 Assembles complete packets containing all questionnaires and field forms collected at household.

5.1.3 Completes HHID Report forms (Figure 2) describing the contents of each packet.

5.1.4 Checks household field visit records to ensure that all household packets eligible for data entry are present at times of custody transfer to the data section.

5.2 Project Data Coordinator (or Delegate)

5.2.1 Signs the HHID Report form contained in household packet as appropriate, and retains completed HHID Report forms (Figure 2, "Received by")

5.2.2 Assembles household packets or physical forms into DP batches.

5.2.3 Completes batch custody forms, including assignment of the DP batch codes, at the appropriate transfer of custody junctures.

5.2.4 Makes and retains photocopies of the batch custody form for records prior to batch transport to Keypunch.

5.2.5 Transports DP batches to Keypunch and transfers custody in person.

5.2.6 Receives photocopies of signed and dated batch custody forms from Keypunch at the time of batch delivery.

5.2.7 Retrieves both the physical and electronic DP batches from Keypunch.

5.2.8 Installs empty databases on computer(s) accessible by Keypunch personnel in anticipation of the next DP batch deliveries.

5.2.9 Assigns data cleaning, validation, and filing tasks to Student Data Assistant(s).

5.2.10 Verifies the filing of the physical forms and questionnaires in the appropriate storage unit(s).

5.2.11 Replaces the photocopy of the batch custody form with the completed original batch custody form in the "Data Processing Batch Sheets" notebook.

5.2.12 Forwards the validated electronic data batch to the Project Data Manager for update of the master database.

5.3 Student Data Assistant(s)

5.3.1 Maintains custody of both physical and electronic DP batches for the duration of data cleaning, validation, electronic QA checks, and filing of the physical data forms.

5.3.2 Writes initials and current date on batch custody forms at the appropriate custody transfer junctures.

5.3.3 Completes "append form" when a DP batch is cleaned, validated, and ready for appendage to the master database (see SOP# UA-D-16.0).

5.4 Keypunch

5.4.1 Receives DP batches by signing batch custody forms and completing "Household Packet Contents Log" in the Logbook (see SOP# UA-C-6.0).

5.4.2 Codes, enters, and verifies data and completes batch tracking form at each stage.

5.4.3 Notifies the Project Data Coordinator when the batch is completed.

5.4.4 Notifies the Project Manager if the batch is not picked up within one week.

5.5 Principal Investigator is responsible for all aspects of the project.

6.0 Equipment

6.1 Materials

6.1.1 Computers linked to the Local Area Network (LAN) as described in SOP# UA-D-1.0

6.1.2 Batch Custody Form (Figure 1)

6.1.3 "HHID Report" form (Figure 2)

6.1.4 "Household Packet Transfer Log" form (Figure 3)

6.2 Reagents (Not Applicable)

7.0 Standard Operating Procedure

7.1 Preparations

7.1.1 After the data are collected and reviewed by the field staff, they are given to the Project Field Coordinator for QA checks; she or he accepts forms when QA standards are met (UA-C-2.0).

7.1.2 The Project Field Coordinator checks against household visit records and verifies that all forms are present.

7.1.3 The Project Field Coordinator assembles the packet and completes the HHID Report form.

7.1.4 The Project Field Coordinator completes the appropriate sections of the "Household Packet Transfer Log" (Figure 3) for all household packets ready for data entry. He or she then transfers custody of these packets to the Project Data Coordinator in person.

7.1.5 The Project Data Coordinator receives custody of the packets and immediately completes the appropriate sections of the "Household Packet Transfer Log."

7.2 Standards and Blanks

Not applicable

7.3 Procedure Description

7.3.1 Each week received packets are batched by the Project Data Coordinator. Packets are sorted in ascending order by key variable(s). The DP batch code is recorded on the batch custody form. This form may be optionally generated via the tracking database.

7.3.2 The Project Data Coordinator writes his or her initials and current date on the batch custody form.

7.3.3 Packets are bundled using a secure tie (eg., rubber-band, string).

7.3.4 A proxy batch custody form (photocopy) is placed in the "Data Processing Batch Sheets" notebook.

7.3.5 The original batch custody form is placed with the bundled packets.

7.3.6 The Project Data Coordinator delivers the batch to Keypunch in person.

7.3.7 Keypunch records the date and initials of person receiving the DP batch(es) on the batch custody form (UA-C-6.0).

7.3.8 All data are coded (UA-D-14.0), entered and verified by Keypunch (UA-D-15.0). When these tasks are completed, the "Coding, Data Entry, and Data Verification Log" form is completed appropriately

(UA-C-6.0).

7.3.9 Keypunch notifies the Project Data Coordinator when verification is completed.

7.3.10 The Project Data Coordinator retrieves the physical and electronic DP batches to the HRP data processing area.

7.3.11 A Student Data Assistant cleans and validates the DP batch.

7.3.12 When the batch is filed, the batch custody form is completed appropriately.

7.3.13 Packets or physical forms are filed in ascending order by key variable(s) in a storage unit located primarily at the HRP site.

7.3.14 The completed, original batch custody form is placed in the "Data Processing Batch Sheets" notebook by the Project Data Coordinator.

7.4 Calculations

Not applicable

7.5 Special QA Checks

7.5.1 Tolerance Limits

(a) DP batches are supposed to be transported to Keypunch on a certain day of each week. A maximum of five business days beyond the original scheduled day of transport is allowable under special circumstances. The latter includes insufficient trained personnel, lack of transportation, and questionable data forms.

(b) Physical and electronic DP batches are supposed to be retrieved from Keypunch within one week of notification that they are ready. A maximum of five business days beyond the original scheduled day of retrieval is allowable under special circumstances. The latter includes insufficient trained personnel, lack of transportation or electronic storage media, and malfunctioning of LAN or pertinent computer hardware/software.

7.5.2 Detection Limits

(a) For the processes outlined in this SOP that must occur within a certain time frame, all deviations are detectable via the batch custody forms.

(b) For the custody transfers of physical data, all errors are detectable because the person representing a link in the chain of custody verifies the claim(s) of the person representing the previous link. This is an independent verification of key variable(s) and the presence or absence

of physical data.

(c) Any error(s) in key variable(s) originating with the Team Leader(s) that went undetected by the Project Field Coordinator will unfortunately be passed through the entire chain of custody, unless discovered by field staff.

7.5.3 Corrective Actions

(a) If the transport of a DP batch to Keypunch exceeds five business days beyond the original scheduled day of transport, then the reason(s) for lack of transport will be addressed immediately. If the usual trained personnel are absent, then the On-Site PI will select someone to perform the job. If usual transportation is unavailable, then the UA shuttle bus or other state vehicle will be used. If the data forms to be sent are questionable, then the DP batch will be voided and the data forms sent at a later date, with a different DP batch code.

(b) If the retrieval of a DP batch from Keypunch exceeds five business days beyond the original scheduled day of retrieval, then the reason(s) for lack of retrieval will be addressed immediately. If the usual trained personnel are absent, then the On-Site PI will select someone to perform the job. If usual transportation is unavailable, then the University of Arizona shuttle bus or other state vehicle will be used. If the LAN or pertinent computer hardware/software are malfunctioning, then data will be retrieved manually via floppy disks if possible. If this is impossible, then data will be retrieved from tape backup(s). If this is impossible, then we will have to wait until pertinent equipment is fixed or otherwise resumes its normal functioning.

8.0 Records

8.1 HHID Report forms (Figure 2) remain with and are filed by the Project Data Coordinator in an appropriate storage container at the HRP site.

8.2 The completed, original batch custody forms (Figure 1) are filed in the "Data Processing Batch Sheets" notebook and are retained by the Project Data Coordinator at the HRP site.

8.3 The completed "Household Packet Transfer Log" forms are housed in a notebook commonly available to both data and field sections at the HRP site.

Figure 1: Batch Custody Form accompanying batch (example)

BATCH CUSTODY FORM; DP batch # _____

Please date, initial and check boxes:

D A T A E N T R Y

To keypunch:	____/____/____	By:____	Received By:____
Called for pickup:	____/____/____	By:____	
From keypunch:	____/____/____	By:____	Received By:____
To Student DP:	____/____/____	By:____	Received By:____
From Stdt DP:	____/____/____	By:____	Received By:____
Filed:	____/____/____	By:____	

Problem sheet attached to batch: [ ] yes [ ] no

H O U S E H O L D P A C K E T S O R F O R M S

	Key Variables	To KP	At KP	To HRP	To SDP	To Files	Comments:
1		[ ]	[ ]	[ ]	[ ]	[ ]	
2		[ ]	[ ]	[ ]	[ ]	[ ]	
3		[ ]	[ ]	[ ]	[ ]	[ ]	
4		[ ]	[ ]	[ ]	[ ]	[ ]	
5		[ ]	[ ]	[ ]	[ ]	[ ]	
6		[ ]	[ ]	[ ]	[ ]	[ ]	
7		[ ]	[ ]	[ ]	[ ]	[ ]	
8		[ ]	[ ]	[ ]	[ ]	[ ]	
9		[ ]	[ ]	[ ]	[ ]	[ ]	
10		[ ]	[ ]	[ ]	[ ]	[ ]	
11		[ ]	[ ]	[ ]	[ ]	[ ]	
12		[ ]	[ ]	[ ]	[ ]	[ ]	
13		[ ]	[ ]	[ ]	[ ]	[ ]	
14		[ ]	[ ]	[ ]	[ ]	[ ]	
15		[ ]	[ ]	[ ]	[ ]	[ ]	

Form ID: UA-C-4.0-1.0

Figure 2: "HHID Report" form inserted in packet (example)

HHID REPORT

PROJECT ID : ____________	STAGE # ______	HHID # ____________
FORM ID : UA- C3.0 - 1.0	V1___/___/___ by____. V2___/___/___ by____.	
REPORT DATE 19___/___/___	V3___/___/___ by____. V4___/___/___ by____.	Team Leader ID # ______

IRN level Sampling

IRN #	Birth Name	Relates to IRN	Status Δ	Con-sent	Base Line	Active Diary	PEF Diary	Follow Up	Diet Diary	Diet √-list	Active Pump	Derm wipe	Urine	Blood	Diet samples
[ ]			Y N	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]			Y N	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]			Y N	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]			Y N	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]			Y N	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]			Y N	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]			Y N	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]			Y N	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]			Y N	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]			Y N	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Household Level Sampling

	Status		Status	
PID Indoors	[ ]	In VOC by Badge	[ ]	Chain of Custody initiated (sig.) : ____________
PID Outdoors	[ ]	Out VOC by Badge	[ ]	
Sentinel Hi-Vol	[ ]	In Pump (PM)	[ ]	
Dust Floors	[ ]	Out Pump (PM)	[ ]	Consigned to packet : [√] on ___/___/___
Soil Composite	[ ]	In Pump (VOC)	[ ]	
Soil Foundation	[ ]	Out Pump (VOC)	[ ]	
Soil Thin Film	[ ]	Dust Surface (wipe)	[ ]	
Water - Tap Flush	[ ]	Dust Thin Film	[ ]	
Water - Drinking	[ ]		[ ]	
Tech Qx	[ ]	Descriptive Qx	[ ]	Box UA G4-2.0

Form ID = UA - C3.0 - 1.0.

Figure 3: "Household Packet Transfer Log" form (example)

Household Packet Transfer Log

	From Field to Data				From Data to Field (as applicable)						initials:
HHID	Stage	Date	Field Init	Data Init	Returned	QA or Inc	Return Date	Data Init	Field Init	*Resubmit Date*	field / data
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__
		__/__/__			Y N	[ ] [ ]	__/__/__			__/__/__	__/__

FORM ID = UA-C3.0-2.0