

National Human Exposure Assessment Survey (NHEXAS)

Arizona Study

Quality Systems and Implementation Plan for Human Exposure Assessment

The University of Arizona
Tucson, Arizona 85721

Cooperative Agreement CR 821560

Standard Operating Procedure

SOP-UA-F-14.1

Title: Collection of Personal Air Samples for Analysis of Pesticides or Metals

Source: The University of Arizona

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

Notice: The U.S. Environmental Protection Agency (EPA), through its Office of Research and Development (ORD), partially funded and collaborated in the research described here. This protocol is part of the Quality Systems Implementation Plan (QSIP) that was reviewed by the EPA and approved for use in this demonstration/scoping study. Mention of trade names or commercial products does not constitute endorsement or recommendation by EPA for use.

Collection of Personal Air Samples for Analysis of Pesticides or Metals

1.0 PURPOSE AND APPLICABILITY

This standard operating procedure (SOP) describes the procedure for sampling personal air for metals and pesticides during a predetermined time period for the EPA NHEXAS project of the University of Arizona/Battelle/Illinois Institute of Technology consortium. The SOP includes the set up of the samplers for collection of either a metals sample or a pesticides sample, the calibration and initial checks of the system, and the termination of sampling.

2.0 DEFINITIONS

- 2.1 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 samples to and from the field.
- 2.2 CHAIN OF CUSTODY RECORD (Fig.1) = A vital data tracking and quality assurance document which accompanies every sample and documents custody, receipt and transfer. The record documents a unique sample identification number assigned to the filters by the Materials Technician through entry of the filter media into the NHEXAS Tracking System.
- 2.3 DATA COORDINATOR = The employee of the research project who supervises data batching, entry and verification.
- 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 KIT = A sampling tool-box containing appropriate collection and storage utensils. For the collection of Personal Air Samples it contains a calibrated SKC pump, tygon tubing, polyethylene gloves, alligator clips and pipe-cleaners, extra copies Personal Air Sampling Data (Fig. 2), a calibrated rotameter with appropriate swagelok fittings, and aluminum foil wrap.
- 2.6 FIELD STAFF = The Field Coordinator, the Team Leader and the Team Members.

- 2.7 HRP OFFICE = The Health Related Professions building, currently located at 1435 North Fremont Avenue; Tucson, AZ 85719. This is an annex of the Respiratory Sciences Center and the primary site of the operations for NHEXAS Arizona.
- 2.8 HOUSEHOLD(HH) = The residence occupied by study respondent(s).
- 2.9 HOUSEHOLD IDENTIFICATION NUMBER(HHID) = A unique number and character combination which is assigned to each respondent household for identification purposes. This number must be recorded on all data (forms, samples, questionnaires and correspondence) collected from the household.
- 2.10 LAB SUPERVISOR = The employee of the research project who supervises laboratory analyses.
- 2.11 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. The Materials Tech also assigns unique sample identification numbers to all samples upon receipt from the manufacturer (UA-G-5.0).
- 2.12 N/A = Not Applicable.
- 2.13 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.
- 2.14 PM = Particulate Matter - specifically less than 10 microns (um) in diameter.
- 2.15 PACKET = A sturdy, envelope-like container that can be fully closed and is large enough to hold the physical data forms generated from sampling and surveying a study household.
- 2.16 QUALITY ASSURANCE (QA)= All those planned and systematic actions necessary for ensuring the accuracy, validity, integrity, preservation and utility of collected data.
- 2.17 QUALITY CONTROL (QC) = Those quality assurance actions providing a means to control and measure the characteristics of a datum, processor the adherence to established parameters.
- 2.18 RESPONDENT = A person in the study population of NHEXAS Arizona. Each household is assigned an HHID. All the family respondents are assigned an Individual Respondent Number (IRN). Each respondent can be uniquely identified by a combined HHID and IRN designator.

- 2.19 **SAMPLE** = The dust deposit left on the filter (or PUF) after sampling is complete. Sample may also refer to the filter (or PUF) before it is exposed, while sampler refers to the SKC Pump, and impactors.
- 2.20 **SAMPLE IDENTIFICATION NUMBER** = A numeric code that uniquely identifies every sample. It is generated by the NHEXAS tracking system by the Materials Technician and assigned to each filter by the Materials Tech. or the Lab Supervisor.
- 2.21 **SKC PUMP** = Is an Aircheck 509 air sampling pump produced by SKC. The pump comes with a 115 V charger. The pump is programmed by the Field Team to draw ambient air through the Sample at 4 L/min.
- 2.22 **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.
- 2.23 **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.
- 2.24 **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.
- 2.25 **URG-2000 sampler** = The sampler that is used for collection of the pesticide sample. The sampler consists of a delrin cap with inlet hole and 10 um cut-point impactor plate, Teflon O-ring, stainless steel filter holder screen, delrin sleeve/ filter holder, and glass sorbent tube (see Fig. 3). This sampling train is frequently referred to as the *pesticide impactor*.
- 2.26 **URG-2000-25F Personal Impactor Filter Pack** = The sampler that is used for collection of the metals sample. The sampler consists of a delrin cap with inlet hole and 10 um cut-point impactor plate, Teflon O-ring, stainless steel filter holder screen, and cassette body with a fixed exit tube. This sampling train is frequently referred to as the *metals impactor*.
- 2.27 **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

- 3.1 Lebowitz, M.D. 1993. Study Design (Revision of 31 Dec. 1993). EPA NHEXAS Cooperative Agreement.

- 3.2 R.W. Whitmore, F.W. Immerman, D.E. Camann, A.E. Bond, R.G. Lewis, and J.L. Schaum; "Non-Occupational Exposures to Pesticides for Residents of Two U.S. Cities," *Arch. Environ. Contam. Toxicol.*, 26, 47-59 (1994).

4.0 DISCUSSION

- 4.1 This procedure describes the steps that must be followed to set-up, calibrate, initiate, and terminate personal air sampling with an actively-pumped system for either pesticides or metals. The pump is worn in a pouch on a belt at waist-level. The impactor is clipped to the carrying cases' shoulder strap as close as possible to the participant's upper chest or collar.
- 4.2 The sampler is programmed to actively pump air through the filter assembly for 1 minute out of every 3 during a 24 hour sampling period when worn by a non-smoking participant. The sampler is programmed to sample air for 1 min. out of every 4, when the pump is worn by a participant who smokes. Thus the pump draws air at 4 Lpm for eight hours on a non-smoker and for 6 hours on a smoker. In both cases the sampling is integrated over a 24 hour period.

5.0 RESPONSIBILITIES

- 5.1 Battelle personnel are responsible for:

- (a) purchasing 37mm and 25mm teflon filters and PUFs;
- (b) processing samples before shipment for field use;
- (c) shipping sampling materials in pre-packaged units to the HRP Office for use in household sampling;
- (d) assuring that blank levels for each batch of filters meet acceptability requirements prior to shipping to the HRP Office;
- (e) documenting blank levels in a NHEXAS laboratory notebook.

- 5.2 The Materials Technician is responsible for:

- (a) receipt of all samples shipped by Battelle personnel;
- (b) logging the material into the Tracking System and generating a unique sample ID for each sample in accordance with SOP UA-G-5.0;
- (c) storing the pesticide puffs in the pre-field storage bin at minus twenty degrees centigrade (-20°C) before assignment to the HH;
- (d) assigning blanks and samplers to the field and documenting the assignment in the Tracking System;
- (e) shipping the exposed samplers and blanks on dry-ice with the appropriate custody documentation to Battelle for analysis.

5.3 The Field Coordinator is responsible for;

- (a) supervision of Field Staff and the Materials Technician;
- (b) performing a 10% QA audit of personal air sampling in the field;
- (c) 100% QA check of all Actively Pumped Personal Air Sample sheets within 24 hours of submission by the Team Leader.

5.4 The Team Leader is responsible for:

- (a) sample site selection;
- (b) custody of all samples until they are transferred to the Field Coordinator.

5.5 The Team Member is responsible for:

- (a) Sample collection according to the procedures outlined in this SOP;
- (b) Documenting the collection on the field sheet (Fig. 2) and the Chain of Custody Record (Fig. 1).

6.0 MATERIALS AND REAGENTS

6.1 Materials

- 6.1.1 Pre-cleaned PUF plugs.
- 6.1.2 Pre-cleaned 25mm Teflon-coated glass fiber filters (Pallflex T60A20) for pesticides.
- 6.1.3 25 mm Teflon filters (Gelman) for metals.
- 6.1.4 Teflon coated tweezers.
- 6.1.5 Small Kim-Wipes (4"x4").
- 6.1.6 Non-sterile, non-powered latex gloves.
- 6.1.7 URG-2000 samplers.
- 6.1.8 URG-2000-25F samplers.
- 6.1.9 SKC Personal Sampler Pumps 224-PCXR8, plus carrying pouch.
- 6.1.10 Flow meter or rotameter.
- 6.1.11 Disposable glass pipettes.
- 6.1.12 Impactor extraction tool.
- 6.1.13 Tygon tubing in 2-ft lengths.
- 6.1.14 Zip-Lock (Freezer) Polyethylene bags (4"x4"), 4 mils thick.
- 6.1.15 Sterile 47 mm petri-dishes, with snap-fit lids.

6.2 Reagents

- 6.2.1 Aluminum foil.
- 6.2.2 Dow Corning 704 vacuum oil.

7.0 PROCEDURE

7.1 Preparation

7.1.1 Procedure to Assemble Impactor for Pesticides (at UA lab)

- (a) Materials Technician puts on a pair of non-sterile, non-powered latex gloves and removes one cleaned PUF plug from a Zip-lock bag using tweezers.
- (b) Using tweezers, the technician pushes the PUF into the glass sorbent holder. The bottom end of the PUF should not extend below the straight part of the glass into the rounded bottom end near the exit tube.
- (c) The delrin sleeve is added to the top of the glass tube. Make certain that the fit is snug. The filter screen is added to the delrin sleeve and a pre-cleaned 25mm Teflon Coated Glass Fiber Filter (TCGFF) for pesticide collection filter is loaded on top of the screen. The Teflon O-ring is added to the top of the filter.
- (d) Two Kim-Wipes are placed on a nearby surface. The impactor plate is placed, frit side up, on the top of the impactor tool and the tool is placed upright on the Kim-Wipe.
- (e) Two drops of the Dow Corning oil are placed in the center of the frit, drop wise, making sure that all the oil is absorbed into the frit. If any oil remains pooled on the surface, use one other clean Kim-Wipe to blot up the excess.
- (f) Use the impactor tool to position the oiled impactor plate inside the delrin cap, with the oiled side facing the inlet jet at the top of the cap. Push the impactor plate in as far as it will go. Remove the impactor plate tool and then use the bottom edge of the tool to push once more on the center of the impactor plate to be certain that the impactor is firmly seated.
- (g) Screw the delrin cap down onto the sleeve/filter holder part of the sampler. Cover the visible PUF on the outside of the glass tube with a small square of aluminum foil to limit PUF exposure to light.

7.1.2 Procedure to Assemble Impactor for Metals (at UA lab)

- (a) Field technician puts on a pair of disposable non-sterile, non-powdered latex gloves and removes one Teflo filter (Gelman) for metals collection using Teflon coated tweezers.
- (b) The URG-2000-25F sampler is opened up and the filter is placed on top of the filter screen. The Teflon O-ring is added to the top of the filter.
- (c) Two Kim-wipes are placed on a nearby surface, and the impactor plate is placed, frit side up, on the top of the impactor plate tool, which is placed on the Kim-Wipe.
- (d) Two drops of the Dow Corning oil are placed in the center of the frit, drop wise, making sure that all the oil is absorbed into the frit. If any oil remains pooled on

- the surface, use another clean Kim-Wipe to blot up the excess.
- (e) Use the impactor tool to position the oiled impactor plate inside the delrin cap, with the oiled side facing the small hole at the top of the cap. Push the impactor plate in as far as it will go. Check as above to make sure that the impactor is completely seated.
 - (f) Screw the delrin cap down onto the delrin base of the sampler.

7.1.3 Standards and Blanks

Ten percent of all samples collected will be for QA and QC purposes. Field Blanks, Lab Blanks and Spike Blanks will undergo the same preparation, transportation, set-up, collection and post-field storage and handling as the accompanying active samplers.

7.1.4 Pre-Field SKC Pump Checks

- (a) SKC pump batteries are completely drained before recharging. Recharging times can vary from 12 to 16 hours. Overcharging may damage the battery. The green-light on the unit recharger will light when charging is complete. Routine pump maintenance is recorded on the SKC Pump Log (Figure 4).
- (b) Two fully charged SKC pumps are assigned to the HH by the Materials Tech before sample collection. Sampler assignment is documented in the NHEXAS Tracking System.

7.2 Field Procedure

TROUBLESHOOTING:

Flow faults encountered on set-up are most likely the result of a crimp or fold in the tygon sample tubing near the SKC pump inlet jet. Clear the fault by adjusting the tubing and restart. For additional troubleshooting hints see Figure 5., *The Personal Air Sampling Troubleshooting Guide*.

7.2.1 Participant selection and Flow Checks

- (a) Two members of the same family will be asked to wear one personal air pump over the same 24 hour period. One person will wear the metals sampling train, while the other will wear the pesticides sampling train.
- (b) If only one person agrees to participate, metals collection dominates and pesticide collection is forfeited. When two members of the HH agree to participate, urge the primary respondent to use the metals sampling set-up.
- (c) Verify participant selection with the Team Leader. Remove the anti-tamper plate from the front of the SKC pump.
- (d) Turn the SKC pump on using the ON/OFF switch, the START/HOLD key and the

FLOW AND BATTERY CHECK KEY. Adjust the flow to 4 Lpm using the center of the black ball in the internal rotameter.

- (e) Connect the impactor to the SKC pump and allow the pump to run for 1 minute.
- (f) To check the flow rate attach the rotameter to the inlet jet on the impactor. Measure the sampler flow rate and record on the Field data sheet. An electronic mass flow meter may also be used.
- (g) Adjust the flow if the measured flow rate is not within 3.8 to 4.2 Lpm by turning the screw (needle valve) that controls the flow in the front of the SKC pump. Clockwise rotation of the screw closes the needle valve and decreases flow rate and counter clockwise rotation opens the valve and increases flow rate.
- (h) If the flow is adjusted, allow the pump to run for one minute at the new setting and repeat steps (f) and (g).
- (i) Repeat (f) - (h) until three consecutive readings within 3.8 to 4.2 Lpm are recorded.
- (j) Once the flow-rate has been adjusted (as necessary) and recorded, pause the SKC pump unit by pressing 'HOLD'.
- (k) Record the temperature, in degrees Centigrade (°C) on the field data sheet (Fig. 2).

A. SKC PUMP PROGRAMMING

In programming the SKC pump use the DELAYED START function to pause the sampler for as long as necessary. The pump should be programmed so that it will start immediately (see Fig. 6. for the relative timing of Personal Air Sample Collection). The delayed start would be 10 minutes in a typical stage 3 scenario followed by a 24 hr. run time. Record the Delayed start in the field Data Sheet (Fig.2)

- (a) While the pump unit is paused (the HOLD indicator should be flashing on the LCD display) press the SET-UP key.
- (b) DELAYED START will flash on the display. Use the SET DIGIT key to increment the flashing character and the SELECT DIGIT to switch from one order of magnitude to the next.
- (c) Program the delayed start for 10 minutes unless otherwise instructed by the Team Leader.
- (d) Press the MODE key and the SAMPLE PERIOD prompt will be flashing. Use SET DIGIT and SELECT DIGIT to program a sample period of 1440 minutes (60 mins. x 24 hrs).
- (e) Press the MODE key and program the PUMP PERIOD. The pump period is the actual number of minutes you want the pump to actively sample before automatic shutdown. Program the PUMP PERIOD for 480 minutes (60 mins. x 8 hrs) in a non-smoking home. Program the PUMP PERIOD for 360 minutes (60 mins. x 6 hrs) in a smoking home. The SKC pump will automatically calculate and control the integrated run time. That is, the pump will program itself to start in 48 hours

and once started, it will sample for one minute and pause for two over a 24 hour period in the non-smoking home. In a smoking home, the pump will pause for 48 hours and then sample for one minute and pause for three over the 24 hour pump period.

- (f) Verify that the pump settings are correct by scrolling through the values using the MODE key.
- (g) Start the sample cycle by depressing the START/HOLD key and DELAYED START will flash on the LCD display.
- (h) Re-attach the anti-tamper plate and verify that there are no knots or kinks in the sample lines.

B. INSTRUCTIONS TO PARTICIPANTS

- (a) Instruct the participant that the pump will start functioning immediately and that they should start to wear their pump.
- (b) Select a mutually agreeable location within the home for the participant to keep the pump assembly after the sampling period.
- (c) Advise the participant that they need not adjust the pump in any way, and that it is programmed to turn itself on and off.
- (d) Demonstrate and coach the participant in the correct methods for wearing the pump and impactor unit.
- (e) Advise the participants to use caution when taking the sampling assembly off (e.g. in a shower) and to make every effort not to crimp or kink the tygon tubing as this will produce a flow fault error.
- (f) Instruct the participant to keep the sampling assembly as close as possible to them when they are not able to wear it. Suggest keeping the pump assembly by the nightstand or on a dresser in the same room while sleeping as possible solutions.
- (g) Advise the participants to contact you or the project immediately via the toll free number should any problems arise.
- (h) Inform respondents that they may "pause" the pump by depressing the HOLD key should the pump become too annoying. It is better to have respondents pause and restart sampling when inconvenient rather than have the pump cycle continuously in another room, etc.

C. SAMPLER AND SAMPLE RETRIEVAL

- (a) The SKC Pump will shut itself off automatically at the end of the sampling period.
- (b) Retrieve the sampler and record any changes in the sample set-up or configuration that you notice on the field data sheet.
- (c) Record flow fault or other error messages as appropriate.
- (d) Start the pump and allow it to run for 2 minutes before obtaining a single take-down flow rate using the rotameter or mass flow meter.
- (e) Remove the anti-tamper plate and record the pump run time by depressing the

PUMP RUN TIME key on the sampler. The pump run time is the total active sampling or exposure time for the sample and should be 480 mins (non-smoking) or 360 mins (smoking).

- (f) The total elapsed time (including the delayed start) is found by depressing the TOTAL ELAPSED TIME key. The total elapsed time should be close to 4320 mins.
- (g) Record the PUMP RUN TIME and the TOTAL ELAPSED TIME in addition to the take-down temperature on the field data sheet (Fig. 2).
- (h) Ask the respondents if they had any trouble wearing the pump for the 24 hour sampling period and if they were able to keep it with them at all times. Record their answer on the field data sheet.
- (i) Disconnect the sampling train. Move as quickly and as smoothly as possible. Place the pesticide impactor in the original container and place in the cooler on blue-ice. The metals impactor may be transported to the UofA Lab at room temperature in the HH Bucket.

D. POST FIELD

- (a) PUF and Filters are removed from the impactors under controlled conditions at the UA Lab. Pesticide PUF and TCGFF are stored at -20°C until they are shipped to Battelle on dry-ice. Shipments will be made to Battelle weekly.
- (b) Open the metals impactor and use clean teflon tweezers to remove the filter. Place metals filter in a Millipore petri-dish for shipment. Secure an unexposed edge of the filter with the inner lip of the petri-dish lid to hold the filter in place during shipment.
- (c) SKC Pumps are fully drained, recharged and recalibrated upon return to the Field Office.

7.3 Calculations - N/A

7.4 Quality Control

Field teams consist of 2 - 3 Team members assigned to different tasks in each HH. On the Personal Air Data Sheet (Figure 2), there are double check points at many critical data entry/recording moments. These opportunities serve as an independent verification of the data and the readings recorded. The Team Member independently verifies the values recorded by their team-mate and records a "" in the appropriate box.

Once the Field Team Member has completed the set-up for either the metals or pesticide sampling train, she or he switches with a second Field Team Member and verifies the readings recorded for the alternate set-up.

7.4.1 Tolerance Limits

- (a) The measured flow rate through both impactors should be 4 Lpm. A reading of between 3.8 Lpm and 4.2 Lpm on three consecutive occasions is tolerable on set-up.
- (b) The total elapsed time should be 4320 minutes unless the pump experiences a flow fault or other problem. The pump run-time should be 480 or 360 minutes unless the pump experiences a flow-fault or other problem.

7.4.2 Detection Limits

- (a) The rotameter will be read to the smallest minor division of the meter.
- (b) Logs of the flow rates of the SKC pumps will be maintained with each pump (see Fig. 4).

8.0 RECORDS

8.1 Chain of Custody Record.

8.1.1 This Record (Fig.1) will serve as the primary record of sample custody after collection in the field. The Team Leader and the collector are responsible for the thorough completion of this form. Enter data in the appropriate fields on the form.

8.1.2 The completed original Chain of Custody Record will remain with the data sample except when the filters are left at a HH while sampling is taking place. The Chain of Custody Record will be stored with the appropriate field sampling sheet in the HH Bucket until the filter is collected from the field at which time the custody record will be reunited with the sample by the Team Leader.

8.2 Personal Air Sampling Data Sheet

8.2.1 This data sheet serves as the primary record of critical flow, source and status information for the sample during and after collection.

Figure 1. Chain of Custody Record

[illegible]

Figure 2. Personal Air Sampling Data Sheet (page 1 of 2).

PERSONAL AIR SAMPLING									
Form Type: <div style="border: 1px solid black; padding: 2px; display: inline-block;">108</div> <small>FORM UA-F-14.0-1.0</small>	Study: <input type="radio"/> 1. NHXAS <input type="radio"/> 2. Border <input type="radio"/> 3. _____ <input type="radio"/> 4. _____ <input type="radio"/> 5. _____	Stage # <div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto;"></div> Collapsed? <input type="radio"/> Y <input type="radio"/> N <input type="radio"/> 8	Team Leader: Init. _____ Tech ID <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div>	HHID <div style="border: 1px solid black; width: 60px; height: 20px; display: inline-block;"></div> IRN first name: _____	F.S. <input type="checkbox"/>	IRN # <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div>	Visit <input type="checkbox"/>	Set up QC: <input type="checkbox"/> <input type="checkbox"/> Take down QC: <input type="checkbox"/> <input type="checkbox"/>	
<div style="display: flex; justify-content: space-between;"> <div> 1. Smoking home <input type="radio"/> Y <input type="radio"/> N <input type="radio"/> N/A 2. <input type="radio"/> Metals or <input type="radio"/> Pesticides </div> <div> If Yes, pump period = 360 min. If No, pump period = 480 min. </div> </div>									
Item	Start	Stop	Set up QC:	Take down QC:					
Date	<div style="border: 1px solid black; padding: 2px;">MO / DAY / YR</div>	<div style="border: 1px solid black; padding: 2px;">MO / DAY / YR</div>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>					
Time	<div style="border: 1px solid black; padding: 2px;">: </div>	<div style="border: 1px solid black; padding: 2px;">: </div>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>					
Pump ID#	<div style="border: 1px solid black; padding: 2px;"></div>	<div style="border: 1px solid black; padding: 2px;"></div>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>					
Impactor ID#	<div style="border: 1px solid black; padding: 2px;"></div>	<div style="border: 1px solid black; padding: 2px;"></div>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>					
Filter ID# or Filter/PUF ID#	<div style="border: 1px solid black; padding: 2px;"></div>	<div style="border: 1px solid black; padding: 2px;"></div>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>					
Temperature	<div style="border: 1px solid black; padding: 2px;"></div> °C °F	<div style="border: 1px solid black; padding: 2px;"></div> °C °F	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>					
RH%	<div style="border: 1px solid black; padding: 2px;"></div> %	<div style="border: 1px solid black; padding: 2px;"></div> %	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>					
Flowmeter ID #	<div style="border: 1px solid black; padding: 2px;"></div>	<div style="border: 1px solid black; padding: 2px;"></div>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>					
Flowmeter Cal. Date	<div style="border: 1px solid black; padding: 2px;">MO / DAY / YR</div>	<div style="border: 1px solid black; padding: 2px;">MO / DAY / YR</div>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>					
Flowmeter Accuracy	<div style="border: 1px solid black; padding: 2px;"></div> %	<div style="border: 1px solid black; padding: 2px;"></div> %	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>					
Comments: <div style="border: 1px solid black; height: 40px; margin-top: 5px;"></div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div>Real Samp. <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></div> <div>Rep. Samp. <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></div> <div>Blank Samp. <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></div> <div>Spike Samp. <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></div> </div>									

Data Use Only: 0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

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Figure 2. Personal Air Sampling Data Sheet (page 2 of 2).

PAGE 2
Personal Air Sampling

ITEM	Start	Stop	Set up QC:	Take down QC:
Flow	<input type="text"/> . <input type="text"/> Lpm	<input type="text"/> . <input type="text"/> Lpm	[]	[]
Cal. Time	<input type="text"/> mins	<input type="text"/> mins	[]	[]
Delayed Start	<input type="text"/> mins		[]	
Sample Period	<input type="text"/> mins	<input type="text"/> mins	[]	[]
Pump Period	<input type="text"/> mins	<input type="text"/> mins	[]	[]
Total Sample Time		<input type="text"/> mins		[]
Tech. ID	Tech ID <input type="text"/>	Tech ID <input type="text"/>	Tech ID <input type="text"/>	Tech ID <input type="text"/>
Replicate or N/A []				
Sample ID#	<input type="text"/>	<input type="text"/>	[]	[]
Impactor ID#	<input type="text"/>	<input type="text"/>	[]	[]
Flow	<input type="text"/> . <input type="text"/> Lpm	<input type="text"/> . <input type="text"/> Lpm	[]	[]
3. Blank Assigned? <input type="radio"/> Yes.... Continue <input type="radio"/> No..... Goto #4		4. Spike Assigned? <input type="radio"/> Yes..... Continue <input type="radio"/> No Stop		
Sample ID# <input type="text"/> or N/A []		Sample ID# <input type="text"/> or N/A []		
Impactor ID# <input type="text"/> or N/A []		Impactor ID# <input type="text"/> or N/A []		
		25 microliter Volume []		

Office Use Only

Form Status:	<input type="radio"/> 1. Cmp <input type="radio"/> 2. N Cmp <input type="radio"/> 3. P Cmp <input type="radio"/> 4. Re-cool <input type="radio"/> 5. Ref <input type="radio"/> 7. Dest <input type="radio"/> 8. N/A <input type="radio"/> 9. Mis		Tech. ID	MO	DAY	YR	Tech. ID	MO	DAY	YR
	QC: <input type="text"/>		<input type="text"/>	/	<input type="text"/>	/	<input type="text"/>	<input type="text"/>	/	<input type="text"/>
	QA: <input type="text"/>		<input type="text"/>	/	<input type="text"/>	/	<input type="text"/>	<input type="text"/>	/	<input type="text"/>
	Init. <input type="text"/>		<input type="text"/>	/	<input type="text"/>	/	<input type="text"/>	<input type="text"/>	/	<input type="text"/>
DE: <input type="text"/>		<input type="text"/>	/	<input type="text"/>	/	<input type="text"/>	<input type="text"/>	/	<input type="text"/>	
DP Batch: <input type="text"/>		<input type="text"/>	QXV: <input type="text"/>		<div style="border: 1px solid black; padding: 2px; display: inline-block;"> F P E R 1 </div>					

Chain of custody initiated (sig.): _____

Consigned to packet on []: ____/____/____ Box UA G4-2.0

Data Use	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	I	J
Only:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Figure 3. URG Impactor for Pesticide Analysis

URG Impactor for Pesticide Collection

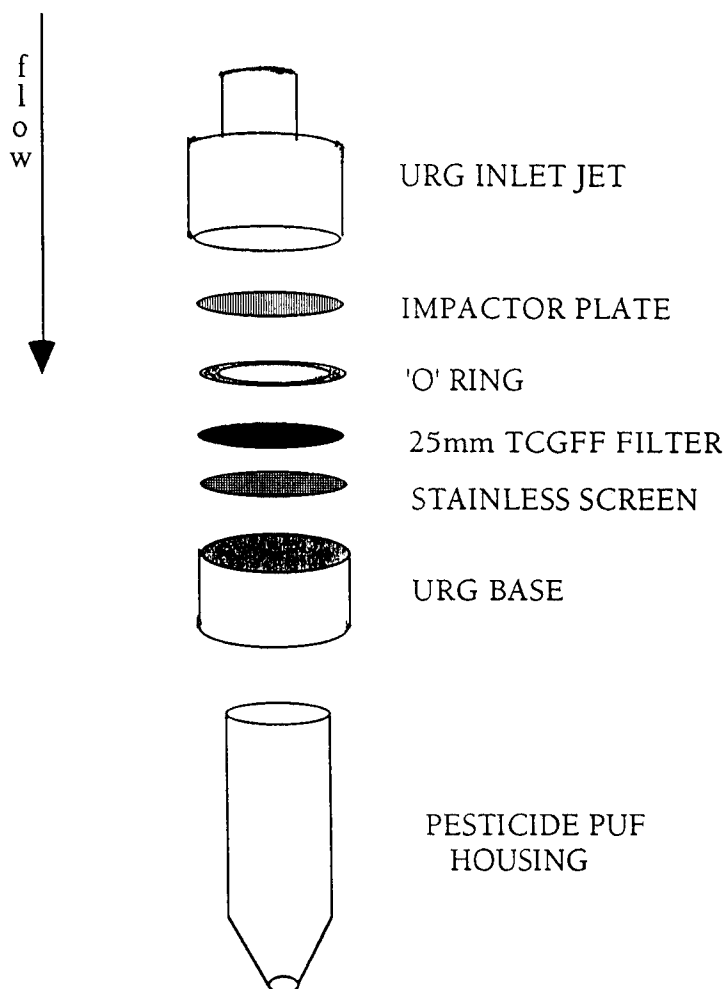


Figure 5. Personal Air Sampling Troubleshooting Guide

No field notes or Troubleshooting guides are currently on record for UA-F-14.0. Additions will be appended and the SOP reviewed and updated in accordance with UA-G-1.0 as appropriate.

Figure 6. Relative Timing of Personal Air Sampling (page 1 of 2).

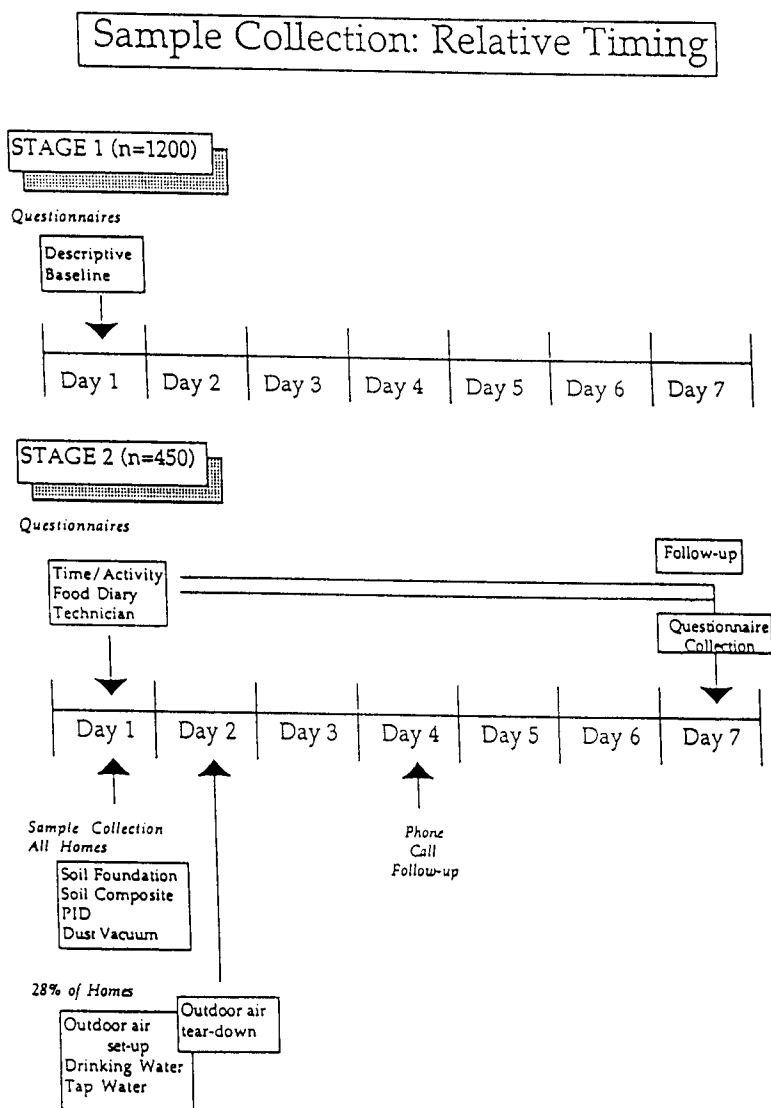


Figure 6. Relative Timing of Personal Air Sampling (page 2 of 2).

