

STANDARD OPERATING PROCEDURE
PREPARATION OF SAMPLE CONTAINERS

1 .O INTRODUCTION

1 .I Purpose

This Standard Operating Procedure (SOP) discusses preparing, labeling and packaging containers to be used for collecting water or soil samples. This SOP will describe two commonly used methods for packaging sample containers by the Environmental Hazards Assessment Program as well as Chain of Custody (COC) handling. Study specific decisions may be made by the project leader regarding sample container preparation and may be described in the study protocol.

1.2 Definitions

- 1.2.1 A **sample container** holds the medium being sampled, e.g. soil, water, air, plant material, etc. when analyzed for pesticides. Containers are typically made of glass to prevent pesticide adsorption to the container. Some pesticides will adsorb to glass so check with the analytical chemist. Typically, soil is collected in pint or quart mason jars, water in amber bottles, air in charcoal tubes or vials, and plants in mason jars. Note: some chemicals degrade in sunlight so if glass containers are not tinted, care should be taken to transport and store samples in the dark.
- 1.2.2 A **Chain of Custody (COC)** is a legal document designed to track a sample container from container preparation through sample analysis as defined in SOP ADMN006.00.
- 1.2.3 A **Sample-Pack** is polystyrene “six-pack” or plastic bag that houses a set of sample containers. The sample-pack is intended to hold samples from a single site, representing a single sampling event such as sampling one ground water well. Each container within the sample pack has a sample number.
- 1.2.4 A **Storage-Pack** is a box of sample containers designated for a single study. The storage-pack is usually kept in the manufacturer’s original shipping box. Each container in a storage-pack has a sample number;
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however, the containers are not intended for a single sampling site like sample-packs. The storage-pack or packs are frequently used to store sampling containers in the warehouse and used as needed for a given study.

2.0 MATERIALS

- 2.1 New or cleaned sample containers as detailed in the study protocol.
- 2.2 Labels pre-printed with Study Number, Sample Number, and Sample Type.
- 2.3 Clear adhesive tape wide enough to cover a label.
- 2.4 COCs appropriate to the study.
- 2.5 For bottles to be packaged as sample packs:
 - (a) Polystyrene "six-pack" bottle trays.
 - (b) Large (minimum 24 X24 inches) plastic bags.
 - (c) Small (minimum 6 X 12 inches) plastic bags.
 - (d) Rubber bands.
- 2.6 For bottles to be packaged as storage packs:
 - (a) Shipping box for appropriate sample containers, normally a 12-pack.
 - (b) Self-adhesive labels (approximately 2 X 3 inches)
- 2.7 For Volatile Organic Analysis (VOA) sample vials:
 - (a) Medium resealable plastic bags (minimum 6 X10 inches).
 - (b) Large resealable plastic bags (minimum 12 X 16 inches).
 - (c) Cardboard file box.
- 2.8 Permanent marking pen.

3.0 PROCEDURES

3.1 Sample Container Preparation

- 3.1 .1 Obtain sufficient sample containers, labels, COCs and other supplies to complete the required number of sample containers/packs required by the study. Ensure that the containers are of the proper type and size for the sampling medium as well as the analytical lab's requirements. Labels

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need to be printed with the study number, unique sample number, and sample type (e.g., water, soil, etc.) for every container that will be used. A spread-sheet program works well for making labels.

- 3.1.2 Remove sample containers from the shipping box (storage-pack) and check their condition. Ensure the cap is secure and the containers are clean and undamaged. Discard any bottles that have lost their caps during transport or are damaged. Wipe off any accumulated dust.
- 3.1.3 Cut out a pre-printed label and affix it horizontally to the sample container using the clear tape. Labels must be placed high enough on the sample containers that they will not be submerged by water accumulating in the individual wells of the six-pack or ice chest. Smooth the tape to assure a good seal around the label.
- 3.1.4 Place the sample container in a sample-pack or back in the storage-pack as required, as detailed below in 3.4 and 3.5. The exception is Volatile Organic Analysis (VOA) vials.
- 3.1.5 For VOA vials, follow the individual study protocol for the number of bottles per sample and whether to make sample- or storage-packs. VOA vials are normally packaged as three vials bearing the same sample number (replicates). These vials are placed together in a resealable plastic bag and treated as a single sample. Using a permanent marker, label each individual bag of 3 vials as primary (P) for the lowest sample number, (B1, B2, etc.) for the backups, through field blank (FB) for the highest sample number. Check with the project leader, since he or she may number and name replicates as they choose. The individual packages are then combined in a larger resealable plastic bag to form a sample-pack.

3.2 COC Handling

- 3.2.1 Fill out the COC for each sample container (or multiple co-numbered VOA vials) as detailed in SOP ADMIN006. As a minimum, each COC must have the study number, sample number, chemicals to be analyzed, and the preparer's signature.

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- 3.2.2 COCs for containers in sample-packs should also have the sample numbers of the other containers in the pack (replicates and field blanks) written in the Remarks section. Generally the primaries are the lowest sample numbers, then back-ups next, and finally the field blank as the highest number in the pack. Circle the sample number and type in the Remarks section to which the specific COC applies (i.e. Backup=004) and indicate the type of replicate or field blank at the top of the COC by writing a PI, BI, B2, FBI, etc. Check with the project leader for specific notation to be used to number and name replicates, Organize the COCs for the sample-pack from lowest to the highest sample number. Fold the COCs and place in a 6" x 12" plastic bag with the lowest sample number showing, then place the bag between the bottles within the sample-pack.
- 3.2.3 For storage-packs, the COCs should be filled-out as in 3.2.1. Then the COCs matching the labeled containers in the storage-pack should be simply stacked on top of the containers inside the box in sample number order. Primary, backup and field blank sample containers may not be designated until the samples are collected.
- 3.2.4 For VOA sample packs, fold and place the associated COCs in a 6" X 12" plastic bag with the lowest sample number visible. Then place the bagged COCs in the large bag with the VOA containers. Seal the large bag, label it as described in 3.3.3, and place it in a box with other VOA sample-packs for the same study. Label the box with the study number and the letters "VOA".

3.3 An Example of Sample-Pack Preparation

The following design is commonly used for well sampling

- 3.3.1 Obtain a sample-pack container suitable to the sample containers directed in the protocol, normally a polystyrene six-pack. Start with the narrow end of the six-pack facing you. Begin placing sample containers starting with the near left compartment. Continue placing containers in sequence in a clockwise direction (See diagram below). If there are less than six bottles

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in the pack, leave the center compartments empty. When finished, the lowest numbered container (usually the primary) and the highest numbered container (field blank) should both be in the same end of the six-pack. See the diagram below.

| | | |
|-----------------------|-----------------|----------------|
| PRIMARY 001 | BACKUP1 002 | BACKUP2 003 |
| FIELD BLANK 006 | BACKU P4 005 | BACKUP3 004 |

SIX-PACK

- 3.3.2 Put the sample-pack, along with the associated COCs in a 24" X 24" plastic bag and close the top of the bag with a rubber band.
- 3.3.3 Label the large bag with the study number, the range of sample numbers inside, and other information required by the project leader. Use a permanent marker to write directly on the bag or on a white adhesive label.

3.4 An Example of Storage-Pack Preparation

- 3.4.1 To pack sample containers in storage-packs, turn the narrow end of the box toward you. Place the sample container in the near left compartment and continue placing the labeled containers in sequence down the row away from you. When a row is full, start again with the near compartment in the row immediately to the right, continuing until the box is full.
- 3.4.2 Use an adhesive label to mark the outside of the box with the study number and the range of sample container numbers inside. On the inside box flap, at the beginning of each row, list the range of sample numbers in that row.

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3.4.3 Place the unfolded COCs in sequence from lowest to highest, on top of the sample containers and close up the box.

3.5 Storage

All prepared sample/storage-packs for a given study should be stored together on the shelves in the West Sacramento warehouse. The warehouse manager will direct the location of storage and whether to use a pallet or place the packs directly on the shelves. Place a removable label with the study number on the shelving to easily identify what containers are stored at each location.

4.0 STUDY SPECIFIC DECISIONS

If deviations from the standard operating procedures outlined above are required, they should be detailed in the study protocol. Before preparing any sample containers for a study, the project leader or field coordinator must review the protocol to determine:

- 4.0.1 The type of container.
- 4.0.2 The number of containers required including spares and quality control.
- 4.0.3 The number of packs to assemble
- 4.0.4 The type of sample-pack or storage-pack required.
- 4.0.5 Discrete label numbers to prevent confusion of sample results.
- 4.0.6 The appropriate COC form.
- 4.0.7 Additional container materials required such as aluminum foil or teflon sheets.