STANDARD OPERATING PROCEDURE No. 20.0
SAMPLE SHIPPING PROCEDURES

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Approved by: _____ **Date:** _____

TABLE OF CONTENTS

1.0 PURPOSE AND SCOPE

The following SOP describes the procedures to be followed when samples are shipped off site.

2.0 RESPONSIBILITIES AND QUALIFICATIONS

The principal investigator or their designated representative is responsible for the implementation to the SOP. The individuals must be cognizant of applicable DOT, USPS, UPS and Federal Express requirements regarding the shipment of samples and hazardous materials.

3.0 DATA QUALITY OBJECTIVES

Compliance with the SOP is mandatory to ensure samples are conveyed to the laboratory within established holding periods. Non-compliance may require the samples to be discarded and another sample obtained.

4.0 RELATED STANDARD OPERATING PROCEDURES

SOP No. 3.0	Drill Core
SOP No. 9.0	Test Pit Excavation, Logging and Sampling
SOP No. 22.0	Groundwater Sampling
SOP No. 30.0	Soil Sampling
SOP No. 33.0	Soil Sampling with Radionuclides

5.0 EQUIPMENT LIST

- Sturdy plastic or metal ice cooler
- Chain-of-Custody forms
- Custody seals
- Mailing labels
- Strapping, clear packing and duct tape
- Ziploc® plastic bags
- Knife or scissors
- Tape and dispenser
- Extra labels, custody seals
- Permanent marker
- Surgical gloves
- Large plastic bag (garbage can size)
- Arrow labels or "This End Up" labels

- Minimum eight pounds of ice
- Wet ice packs (frozen)
- Bubble wrap or other packing material
- Federal Express form (with account number)
- Vermiculite (or commercially available cat litter)

6.0 COLLECTION OF SAMPLES

Sample collection and all shipment activities will be under the direction of the Principal Investigator (PI).

7.0 PROCEDURES

For shipping purposes, samples are segregated into two classes; environmental samples and restricted articles (i.e., hazardous materials). Environmental samples can also be categorized based on expected or historical analyte levels (i.e., low or high). An environmental sample is one that is not defined as a hazardous material by the Department of Transportation (DOT, 49 CFR Part 171.8). The DOT defines a "hazardous material" as a substance which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated. Any material of a suspected hazardous nature, previously characterized as hazardous or known to be hazardous is considered a restricted article.

In general, the two major concerns in shipping samples are protecting the samples from incidental breakage during shipment and complying with applicable DOT and courier requirements for restricted article shipments.

Protecting the samples from incidental breakage can be achieved by following "common sense." All samples should be packed in a manner that will not allow them to freely move about in the cooler or shipping container. Glass surfaces should not be allowed to contact each other. When possible, repack the samples in the same materials that they were originally received in from the laboratory. Each container should be cushioned with plastic bubble wrap, styrofoam or other nonreactive cushioning material. Shipping hazardous materials should conform to the packaging, marking, labeling and shipping instructions identified in 49 CFR Parts 172 & 173.

Environmental samples shall be packed for shipment using the following procedures:

1. Select a sturdy cooler in good condition. Secure and tape the drain plug with fiber tape. Line the cooler with a large, heavy-duty plastic bag.
2. Place 2-4 inches of bubble wrap or other packing material in the bottom of the cooler.
3. The sample packer should wear eye protection and protective gloves when handling the samples during the packing process.
4. After ensuring that sample container lids are secure, place the bottles in separate and appropriately sized Ziploc® polyethylene bags. Seal the bags with tape.

5. Wrap duplicate volatile organic (VOA) vials in one piece of bubble wrap or other packing material as a "VOA sandwich."
6. Place the bottles in the cooler with sufficient space to allow for the addition of more bubble wrap or other packing material between the bottles. Large or heavy sample containers should be placed on the bottom of the cooler with lighter samples (i.e., VOAs) placed on top to eliminate breakage.
7. Put "wet ice" (i.e., ice packs) or ice that has been placed in sealed heavy-duty polyethylene bags on top of or between the samples. Pack enough ice in the cooler to chill the samples during transit. If the cooler is shipped on a Friday or Saturday for Monday delivery, double the amount of ice placed in the cooler. Fill all remaining space with bubble wrap or other packing material. Securely fasten the top of the garbage bag lining the cooler with tape.
8. Place chain-of-custody form (and, if applicable, CLP traffic reports) into Ziploc® plastic bag and affix to the cooler's inside lid, then close the cooler. Securely fasten the top of the cooler shut with fiber tape. Place two signed and dated chain-of-custody seals on the top and sides of the cooler so that the cooler cannot be opened without breaking the seals.
9. Once cooler is sealed, shake test cooler to make sure that there are no loose sample containers in the cooler. If loose samples are detected, open the cooler and repack the samples.
10. Using clear tape, affix a mailing label and return address to the top of the cooler.
11. Mark the cooler with "This End Up" and arrow labels that indicate the proper upward position of the cooler.
12. Ship samples via priority overnight express to the contracted analytical laboratory for next morning delivery. If applicable, check for Saturday delivery.
13. Declare value of samples on the shipping form for insurance purposes. Note this declared value should reflect the cost to recollect the samples.
14. Record the tracking numbers from the Federal Express forms in the field notebook. Also, retain the customer's copy of the Federal Express airbill.

Hazardous materials should be packed according to the above procedures with the following additions:

1. Place samples in individual Ziploc® plastic bags and secure with a plastic tie.
2. Place samples in paint cans in a manner which would prevent bottle breakage (i.e., do not place glass against glass).
3. Place vermiculite or other absorbent packing material in the paint can around the samples. The amount of packing material used should be sufficient to absorb the entire contents of the sample if the container is broken during shipment.
4. Secure a lid to the paint can with can clips and labels the outside of the can with sample numbers and quantity. Mark the paint can with "This End Up" and arrow labels that indicate the proper upward position of the paint can.

5. Package the paint cans in DOT boxes or coolers, with appropriate DOT shipping labels and markings on two adjacent sides of the box or cooler.
6. Ship the restricted articles via overnight courier following the courier's documentation requirements. A special airbill must be completed for each shipment. Retain a copy of the airbill for records and tracking purposes, if necessary.

8.0 QUALITY ASSURANCE/QUALITY CONTROL

During the project QA/QC field book checks will be conducted by the designated project representatives. Any corrective action must be conducted in writing by the owner of the Note book and initialed by the QA/QC representative.

9.0 DOCUMENTATION

All sampling shipping documents, manifests, and notebooks must be maintained by the designated Principal Investigator (PI).

10.0 REFERENCES

EPA, March 2001, Guidance for Preparing Standard Operating Procedures (SOPs) EPA QA/G-6, EPA/240/B-02/004, Office of Environmental Information, Washington, D.C.

EPA, March 2001, EPA Requirements for Quality Management Plans, EPA A/R-2, EPA/240/B-02/002, Office of Environmental Information, Washington, D.C.

EPA, Nov ember, 2002, Guidance on Environmental Verification and Data Validation, EPA QA/G-8, EPA/240/R-02/004, Office of Environmental Information, Washington, D.C.

EPA, December 2002, Guidance for Quality Assurance Project Plans, EPA AQ/G-5, EPA/240/R-2/009, Office of Environmental Information, Washington, D.C.