



Environmental Analysis Program

Pomona College
Biogeochemistry Laboratory

SOP-F008

Sample Labeling, Chain of Custody, and Transport

Standard Operating Procedure

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Author(s)	Marc Los Huertos
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Organization	EA Program, Pomona College

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1. Purpose

This SOP establishes a single, program-wide standard for labeling field samples, completing chain of custody (COC) documentation, and transporting samples from the field to the laboratory (APHA et al., 2012; U.S. Environmental Protection Agency, 2002). Consistent labeling prevents sample mix-ups, and a complete chain of custody ensures that data are legally defensible and scientifically traceable. These procedures apply to all sample types (water, soil, sediment, biological tissue, air filters) collected by the EA Program.

2. Scope

- **Applies to:** All environmental samples collected during EA Program field activities, whether analyzed in-house or submitted to an external laboratory
- **Does not apply to:** Internal laboratory standards and reagents (labeled per [SOP-L005](#)); data files and digital records (see [SOP-L801](#))
- **Location:** All EA Program field sites, vehicles, and laboratory receiving areas (SGM 133, 134)

3. Responsibilities

Role	Responsibility
PI / Project Lead	Approve sample ID scheme for each project; designate receiving personnel
Field Lead	Verify labels and COC forms before leaving the field
Trained Personnel	Label samples and complete COC per this SOP
Receiving Personnel	Accept custody, verify sample condition, log receipt
New Students	Complete training before independent sampling

4. Definitions

- **Chain of custody (COC):** A documented, unbroken record of the collection, transfer, and possession of a sample from the moment of collection through final analysis or disposal; used to demonstrate sample integrity for legal or regulatory purposes (U.S. Environmental Protection Agency, 2002).
- **Holding time:** The maximum elapsed time between sample collection and analysis within which the sample remains chemically stable and analytically valid; analyte- and preservative-specific (e.g., 6 h for *E. coli*, 28 d for nitrate in H_2SO_4) (APHA et al., 2012).
- **Preservative:** A chemical added to a sample container (e.g., H_2SO_4 , HNO_3 , $\text{Na}_2\text{S}_2\text{O}_3$) to prevent biological or chemical degradation of target analytes during transport and storage (APHA et al., 2012).
- **QA/QC sample:** A blank, duplicate, spike, or other quality-control sample collected alongside field samples to assess contamination, precision, and accuracy; documented on the COC form.
- **Sample ID:** A unique alphanumeric code assigned to a sample at the moment of collection; the primary key linking field records, labels, COC forms, and laboratory data.
- **Zero headspace:** A sample container filled completely with no air gap; required for volatile organic compound (VOC) samples to prevent loss of analytes to the headspace.

5. Safety and Hazards

Hazards

- **Chemical:** Some sample containers include chemical preservatives (sulfuric acid, nitric acid, sodium thiosulfate). Handle pre-preserved bottles with care. Refer to [SOP-L003](#).
- **Physical:** Coolers loaded with ice and sample bottles can be heavy. Use proper lifting technique.
- **Biological:** Soil and water samples may contain pathogens. Wear nitrile gloves when handling samples.

5.1. Required PPE

- ☐ Nitrile gloves
- ☐ Safety glasses (when handling preserved bottles)

5.2. Required Training

- [SOP-F001 Field Safety](#)
- [SOP-F003 Field Notebook Protocols](#)

6. Equipment and Materials

Item	Storage	Notes
Pre-labeled sample bottles	SGM 133	Correct preservative per method
Waterproof field labels	SGM 133	Rite in the Rain or equivalent
Permanent markers (fine-tip)	SGM 133	Black; waterproof
Chain of custody forms	SGM 133	One form per cooler
Cooler with ice packs	SGM 132	Pre-chilled to 4 °C
Bubble wrap / packing foam	SGM 133	For fragile glass bottles
Zip-lock bags	SGM 133	Secondary containment for preserved bottles
Sample seals / custody tape	SGM 133	For regulatory submissions

7. Procedure

7.1. Sample ID Scheme

The PI or project lead establishes the sample ID scheme before the first field outing. A standard EA Program sample ID has the structure:

[ProjectCode] - [SiteCode] - [YYYYMMDD] - [SampleType] - [Replicate]

Example: SGMC-US1-20260415-GW-A

Record the scheme in the project metadata file and in the field notebook before the first sampling event.

7.2. Labeling Sample Containers

1. Write the sample ID on the pre-printed label or directly on the container using a waterproof marker.
2. Include the following minimum fields on every label:
 - Sample ID
 - Collection date and time (24 h format)
 - Collector initials
 - Matrix (water / soil / sediment / tissue / air filter)
 - Preservative (if present)
3. For pre-preserved bottles, verify the preservative type is printed or written on the container before field use.
4. For biological samples requiring cold preservation, add an ice temperature indicator sticker.

7.3. Completing the COC Form

1. Start a new COC form for each cooler.
2. Fill in all header fields: project name, project number, field lead, date, field site.
3. Enter each sample in the log: sample ID, matrix, collection date and time, preservative, number of containers, and requested analysis.
4. Include QA/QC samples (field blanks, field duplicates, trip blanks) on the same COC form as the associated samples.
5. Sign and date the form before departing the field.

7.4. Sample Transport

1. Place samples in the cooler with sufficient ice to maintain 4 °C.
2. Separate chemically preserved bottles from unpreserved samples using a zip-lock bag as secondary containment.
3. Verify the cooler temperature on departure and on arrival using a thermometer; record both readings on the COC form.
4. Transport samples promptly; do not leave samples in a hot vehicle.

7.5. Receiving Samples in the Laboratory

1. The receiving person checks the sample count against the COC form.
2. Verify that the number of containers matches the COC listing; note any discrepancies.
3. Check sample temperature with a thermometer placed among the bottles and record on the COC form.
4. Transfer samples to appropriate storage:

- Water samples: refrigerator at 4 °C ([SOP-L106](#))
 - Soil samples: refrigerator at 4 °C (short-term) or freezer (archiving)
 - Biological samples: freezer at -20 °C or -80 °C as required
5. Both the field lead and the receiving person sign and date the COC form to document the transfer of custody.
 6. File the signed COC form with the project records.

8. Quality Control

- The field lead reviews all labels and the COC form before leaving the field site.
- Receiving personnel verify sample count, condition, and temperature upon arrival.
- Any broken, leaking, or incorrectly labeled samples are flagged on the COC form and reported to the PI within 24 hours.
- COC forms are retained for the duration of the project plus a minimum of 5 years.

9. References

APHA, AWWA, & WEF. (2012). *Standard methods for the examination of water and wastewater* (22nd ed., p. 1360). American Public Health Association.

U.S. Environmental Protection Agency. (2002). *Guidance for quality assurance project plans (EPA QA/G-5)* (EPA/240/R-02/009). U.S. Environmental Protection Agency. <https://www.epa.gov/sites/default/files/2015-06/documents/g5-final.pdf>

10. Related SOPs

SOP	Title	Relationship
F001	Field Safety	Required prerequisite
F002	Field Equipment Checklist	Labeling supplies on checklist
F003	Field Notebook Protocols	COC recorded in notebook
F300	Surface Water Sampling	Sample-specific preservation
F303	Groundwater Sampling	Well-specific labeling
F400	Soil Sampling	Soil-specific labeling
L802	Quality Control and QA	QC sample requirements

11. Training Record

Before labeling and handling samples independently, personnel must:

1. Read this SOP and [SOP-F003 Field Notebook Protocols](#) in full
2. Demonstrate correct sample labeling using the project ID scheme
3. Complete a COC form correctly during a supervised field outing
4. Be signed off by the field lead or PI