STANDARD OPERATING PROCEDURE
Creating and Completing a Chain of Custody Record

KEY WORDS

COC, laboratory results, sample handling, documentation

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Environmental Monitoring Branch organization and personnel, such as management, senior scientist, quality assurance officer, project leader, etc., are defined and discussed in Standard Operating Procedure (SOP) ADMN002.

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1.0 INTRODUCTION

1.1 Purpose

A Chain of Custody record (COC) establishes a record of the control, transfer, and disposition of samples collected by the Environmental Monitoring (EM) Branch. This custody documentation is intended to ensure that samples are appropriately handled and are not tampered with or contaminated. COCs also record essential data associated with each individual sample. Typically, a COC is used to record three types of information: field information, laboratory information, and the staff who handled the sample. This SOP describes EM Branch COC procedures and provides the minimum requirements for reporting analytical data by the laboratory on the COC or in a separate electronic format.

1.2 Definitions

1.2.1 **Chain of Custody** (COC) is a legal document designed to track persons who are responsible for obtaining bottles and sample collection, sample delivery, sample storage, and sample analysis. It provides a record of sample traceability.

1.2.2 A **sample number** is a unique number given to a sample, usually attached to the sample container (e.g., bottle, jar, tube, and canister) with label tape (SOP QAQC005).

1.2.3 The **QA officer** is responsible for the delivery, handling, and disposal of unanalyzed samples. The position is commonly referred to as the lab liaison. In this SOP, QA officer duties related to the delivery, signature, and general disposition of samples can be conducted by a person designated by the QA officer.

2.0 PROCEDURES

2.1 Creating the COC

COCs are created for each study and generally have three sections: field information, laboratory information, and the signatures of the staff who handle the sample. The form is usually created in a spreadsheet program by field staff (see 3.0 for an example COC for each program). Results can be reported on the COC or in a separate electronic format, depending on the program's needs. Always share new

COC templates with the QA officer to ensure that the design is adequate for the laboratory.

2.1.1 **Field Information and Codes** – The COC must contain places to enter the following field information: study number, location, sample number, and sampling date. The COC may include documentation of the replicate, backup, and/or field blank numbers associated with the sample. If the sample type or matrix is not already included in the title, it should be listed on the COC. All information can be filled out manually or digitally. Other field information may be recorded as specified in the study protocol or as required by the program. It is imperative that only one sample exists with a particular sample number per study number to prevent duplicates in EM Branch databases.

2.1.2 **Laboratory Information** – The COC or the electronic results spreadsheet must be pre-printed or contain spaces to enter the following laboratory information corresponding to the requirements on the Laboratory Specification Sheet (SOP QAQC002) and the study protocol:

Listed on the COC **and** the electronic results spreadsheet:

- Analytical method number
- Analytical laboratory address

Listed on the COC **or** the electronic results spreadsheet:

- List of analytes to be included in the analysis
- Reporting limit of each analyte
- Date of extraction
- Date of analysis
- Signature or initials of the person performing extraction and analysis
- Signature or initials of the person approving the results
- Analytical results

If results are reported on the COC, the statement “Results relate only to the sample tested” must be printed on the COC. The laboratory may have additional QA documentation requirements.

2.1.3 **Signatures** – The COC must contain lines for all staff who handle the sample to sign their name or initials (signatures or initials can be hand-written or digital). Their signatures are a record of who had custody of the sample during all steps of the process. There should be signature lines to relinquish possession of the sample and to receive custody of the sample. When designing the COC, include enough lines to account for all potential changes in sample custody.

2.2 Filling out the Chain of Custody

All physical signatures must be in ballpoint pen (blue is best) and followed by the date and time the COC was signed. Digital signatures are also acceptable for COCs. No erroneous information may be erased on the COC. Errors must be lined out and initialed, and then the correct information written. See SOP ADMN005 for details regarding the retention of data.

2.2.1 **Container Preparation** – The COC is initiated at the time the containers are prepared (SOP QAQC005). At that time the COC includes the study number, the sample number (which should correspond with a unique number on a sample container), and chemicals to be analyzed.

2.2.2 **Sample Collection** – The field staff who obtain the sample containers, transport them to the field, and collect the samples sign their name on the COC under the “collect sample and transport” line and write the date and time the sample was collected on the line next to it. They also fill in the information required on the COC and sign the “relinquished by” line. If numerous staff are involved in the sample collection, only one person is required to sign the COC. Before relinquishing the samples and COCs, make copies for use as documentation in case the sample is lost or to review the list of associated backup and field blank samples.

2.2.3 **Sample Storage** – When field staff submit samples to the QA officer, the QA officer signs the COC on the “QA staff receiving” line, and writes the date and time. Keep the COCs with the check-in sheets for the QA officer to verify the samples before delivering them to the laboratory. The COCs and check-in sheets are used to verify backup samples prior to storage in the refrigerator or freezer. If the QA officer is unavailable when samples arrive at the warehouse, field staff should temporarily leave samples in proper storage until the QA officer can organize and check them in.

2.2.4 **Sample Delivery** – Upon sample delivery to the laboratory, the QA officer or other designated personnel signs the “relinquished to lab” line. Subsequently, the laboratory personnel signs and dates the "received by" line. (Note: If samples are delivered straight from the field to the laboratory, making copies of the COCs at the laboratory is recommended.)

2.2.5 **Laboratory Analysis** – In addition to signing at the receipt of the samples in 2.2.4, the laboratory records the date of extraction, date of analysis, and the signature or initials of the person performing extraction and analysis on the COC, unless instructed to record this information on the electronic results spreadsheet.

2.3 Reporting results

2.3.1 **Reporting on the COC** – If results are reported on the COC, the chemist handwrites the analysis results directly on the COC. If not pre-printed on the COC, the chemist fills in the reporting limit of each analyte and method number as well as the information noted in 2.2.5. When the analysis is completed and approved by the laboratory, the laboratory gives the QA officer the originals. The laboratory retains the copies.

2.3.2 **Electronic Format Requirements –** The Laboratory Specification Sheet (SOP QAQC002) specifies the requirements for the electronic reporting of analytical results from the laboratory to the EM Branch. At a minimum, the results should include:

- EM Branch sample numbers
- Study number
- Associated laboratory sample numbers
- Quality control results
- Analytical results
- Reporting limits
- Method detection limit
- Analytical method number
- Sample receipt date
- Extraction and analysis dates

- Chemists' names (or abbreviation of the names)
- Reviewer's name and date

Upon completing the analysis and internal laboratory review, the laboratory forwards the results to the QA officer attached to an email. Subsequently, the laboratory sends the original COCs and paper copies of the results to the QA officer.

2.3.3 **Data Review and COC Delivery** – The QA officer reviews the analytical data and associated quality control included on either the COC or the electronic format sent by the laboratory (SOP QAQC001). After the review, the QA officer sends the approved data and QC to the project leader.

3.0 ATTACHMENTS

3.1 Example COCs for each program in the EM Branch.

3.1.1 Groundwater Protection Program – Triazine Screen.

3.1.2 Air Protection Program – Air Sampling Canister.

3.1.3 Surface Water Protection Program – Liquid Chromatography (LC) Full Screen.

California Department of
Food and Agriculture
Center for Analytical Chemistry
Environmental Monitoring Section
3292 Meadowview Road

Groundwater Monitoring Study

California Department of
Pesticide Regulation
Environmental Monitoring
1001 I Street
Sacramento, CA 95812-4015

Chain of Custody Record and Lab Result Report (use dark Ink)

P2 | **TRI**

Study #	Sample #	County	Meridian	Well Number Twnshp	Rng	Sec	Tract	Seq. #	D/Z Code	Date Sampled Mo.	Day	Yr.	Time	Sample Code	Well Use
	236													W A T	

LOCATION CODE:		Well Owners Name:	
Person Collecting:		pH :	Adj. pH:
Partner:		Minutes Pumped:	

Sample Series		
Primary (P1)	#	235
Primary (P2)	#	236
Backup (BU1)	#	237
Backup (BU2)	#	238
Field Blank (FB1)	#	239
Field Blank (FB2)	#	240

REMARKS:

SIGNATURES

1. Collect sample and transport: Date/Time
2. Relinquish sample to QA Staff: Date/Time
3. QA Staff receiving: Date/Time
4. Relinquish to CDFA Lab: Date/Time
5. Received by Lab: Date/Time

Method # EMON-SM-62.9

Lab Sample #

Logged in by Lab: Date

Extracted by: Date

Analyzed by: Date

Approved by: Date

LAB RESULTS relate only to the sample tested	Amount (ppb)	Reporting Limit (ppb)
TRIAZINE SCREEN		
ACET		
ATRAZINE		
BROMACIL		
DACT		
DEA		
DIURON		
DSMN		
HEXAZINONE		
METRIBUZIN		
NORFLURAZON		
PROMETON		
PROMETRYN		
SIMAZINE		
TEBUTHIURON		
PROPAZINE		

REPORT RESULTS ELECTRONICALLY.

REPORT TRACE VALUES WITH ESTIMATED CONCENTRATIONS

California Department of
Food and Agriculture
Center for Analytical Chemistry
Environmental Monitoring Section
3292 Meadowview Road
Sacramento, CA 95832

Chain of Custody Record
and Lab Result Report
(use dark ink only)

California Department of
Pesticide Regulation
Environmental Monitoring
1001 I Street
Sacramento, CA 95812-401

Study #257 - Canister (Xonteck 901 or Restek Regulator)

Study #	Date Start Month	Date Start Day	Date Start Year	Date End Month	Date End Day	Date End Year	Site:
2 5 7							Crew:

		Only use column corresponding to instrument used.	
Sample Number	Location Code	**Xonteck**	**Regulator**
		Set Up Flow (mL/min)	Starting Flow (mL/min)
Time On	Time Off		Notes:
		Starting Pressure Sampler	
Run Time (min)	Machine ID#		
		Average Flow (mL/min)	Ending Flow (mL/min)
Starting Pressure - Canister	Ending Pressure Canister		
		Ending Pressure Sampler	

Laboratory Results Section:
Lab results relate only to the sample tested

	Amount Detected (ppbv)	Reporting Limit (ppbv)
Methyl Bromide		0.01
cis-1,3-Dichloropropene		0.01
t-1,3-Dichloropropene		0.01

1. Sample started	Date/Time	Extracted by:	Date
2. Sample finished	Date/Time	Analyzed by:	Date
3. Sample transport	Date/Time	Approved by:	Date
4.QA staff receiving	Date/Time	Method #	Lab #
5. Relinquished to CDFA Lab	Date/Time	Received by at lab	Date/Time
6.		Logged in by lab	Date/Time

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3292 Meadowview Road
Sacramento, CA 95832
(916) 262-1434 FAX (916) 262-1572

LC-Full

Chain of Custody Record and Lab Result Report
(use dark blue or black ink only)

Surface Water Study X

California Department of
Pesticide Regulation
Environmental Monitoring
1001 I Street
Sacramento, CA 95812-4015

Study #	**Matrix:**	Lab results relate only to the sample tested. Compound to be analyzed:
Crew:		See template

	Sample Number	Site	Sample Date	Sample Time	Matching back-up	Lab Number	Lab Note
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

1. Obtained bottles and sampled	Date	Extracted by:	Date
2. Relinquished samples after transport	Date	Analyzed by:	Date
3. QA staff receiving	Date	Approved by:	Date
4. Relinquished to CDFA Lab	Date/Time	Method #	Confirmation #
5.	Date/Time	Received by at lab	Date/Time
6.	Date/Time	Logged in by lab	Date/Time