

# STANDARD OPERATING PROCEDURE FOR CHAIN-OF-CUSTODY SAMPLES

State of Utah  
Department of Environmental Quality  
Division of Water Quality



Revision 0  
Effective July 1, 2013

*Utah Division of Water Quality (DWQ) Standard Operating Procedures (SOPs) are adapted from published methods, or developed by in-house technical experts. This document is intended primarily for internal DWQ use. This SOP should not replace any official published methods.*

*Any reference within this document to specific equipment, manufacturers, or supplies is only for descriptive purposes and does not constitute an endorsement of a particular product or service by the author or by DWQ. Additionally, any distribution of this SOP does not constitute an endorsement of a particular procedure or method.*

*Although DWQ will follow this SOP in most instances, there may be instances in which DWQ will use an alternative methodology, procedure, or process.<sup>1</sup>*

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<sup>1</sup> *Disclaimer language above adapted from Washington State Department of Ecology SOPs.*

**REVISION PAGE**

Date	Revision #	Summary of Changes	Sections	Other Comments
7/1/13	0	Not applicable	Not applicable	New SOP adapted from Monitoring Manual. Began document control/revision tracking.

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## 1.0 SCOPE AND APPLICABILITY

This document presents the Utah Division of Water Quality's (DWQ) Standard Operating Procedure (SOP) for sample Chain-of-Custody (CoC). Sampling activities under the jurisdiction of DWQ include enforcement sampling, emergency spill response, and investigations of contamination. These types of sampling activities may involve litigation and therefore it is paramount that CoC protocol is followed to ensure sample integrity from the time the sample is collected until it is turned over to the laboratory. CoC protocol provides legally defensible data accomplished through physical control of the sample, and sealed sample containers. If you are unsure if your samples require CoC, please contact DWQ's QA Officer, Jim Harris, for guidance, at (801) 536-4360.

This SOP does not cover sample collection. For sample collection protocols, consult other DWQ SOPs such as those for Water Chemistry Sample Collection or for Collection of Lake Water Samples.

This SOP is intended to be used by the field sampler and only covers CoC up through delivery of the samples to the laboratory. The analyzing laboratory must have protocols for handling of CoC samples from receipt to reporting the sample results.

## 2.0 SUMMARY OF METHOD

Samples are collected in the appropriate bottles, labeled accurately, and properly sealed (either individually or as a set within a sealed cooler). The field sampler completes a CoC form and stores the samples properly, while maintaining physical control of the samples, until they are delivered to the laboratory. At the laboratory, the person delivering the samples signs the CoC form to relinquish the samples and the laboratory signs the CoC form to acknowledge receipt of the samples.

## 3.0 DEFINITIONS

Chain-of-Custody (CoC): As defined by EPA, Chain-of-Custody is "a legal term that refers to the ability to guarantee the identity and integrity of the sample (or data) from collection through reporting of the test results. It is a process used to maintain and document the chronological history of the sample (or data). Chain-of-custody documents should include the name or initials of the person collecting the sample (or data), each person or entity subsequently having custody of it, dates the items were collected or transferred, the collection location, a brief description of the item, and a sample identification number."

Chain-of-Custody form: CoC documentation that provides information about the collected samples and documents each person having custody over the sample and the duration of custody. This

form also notifies the laboratory of the analyses to be performed on the samples. The CoC form should remain with the samples. CoC forms can be obtained from DWQ's QA Officer by contacting Jim Harris at (801) 536-4360.

Chain-of-Custody seal: CoC documentation, essentially a long sticker, used to seal sample bottles or a cooler containing samples and show that sampling containers/coolers have not been tampered with since the time of collection. CoC seals can be obtained from DWQ's QA Officer by contacting Jim Harris at (801) 536-4360.

Custody: As defined by EPA, "samples and data are considered to be in your custody when: 1) they are in your physical possession, 2) they are in your view, after being in your physical possession, 3) they are in your physical possession and then locked up so that tampering cannot occur, or 4) they are kept in a secured area, with access restricted to authorized personnel only." These restricted areas include the DWQ Shop and the DWQ Building Wet Lab.

VOC: volatile organic compound

#### **4.0 HEALTH AND SAFETY WARNINGS**

Not applicable. See other DWQ SOPs for health and safety warnings accompanying sample collection.

#### **5.0 CAUTIONS AND INTERFERENCES**

Samples should be collected following an appropriate DWQ SOP or other approved collection method. Sampling containers and preservatives should be appropriate for the analysis to be performed. To preserve integrity, samples must be stored at appropriate temperatures (refrigerated or frozen, or on wet or dry ice) as indicated by the sample type. Consult the DWQ SOP or analyzing laboratory to confirm appropriate sampling containers, preservatives, holding times, and storage temperatures.

#### **6.0 PERSONNEL QUALIFICATIONS/RESPONSIBILITIES**

Samplers collecting CoC samples are required to read this SOP annually and acknowledge they have done so via a signature page that will be kept on-file at DWQ along with the official hard copy of this SOP (see **Appendix 1**).

Personnel collecting CoC samples must be familiar with sampling techniques, safety procedures, proper handling, and record keeping. Samplers are responsible for

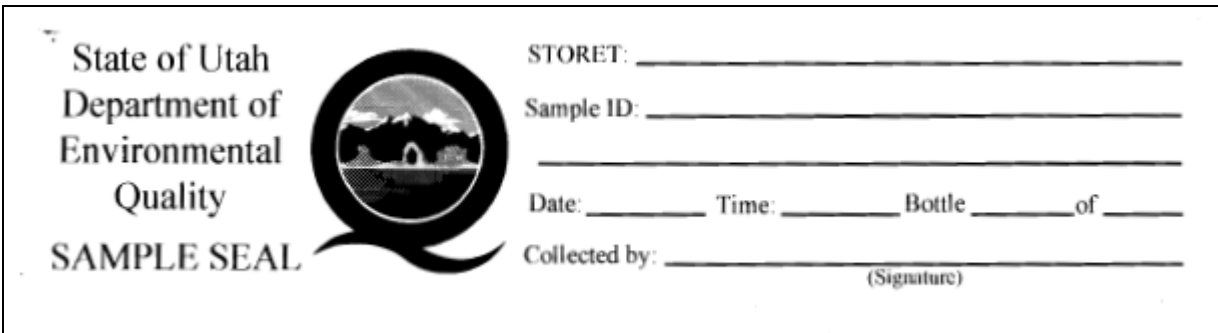
attending refresher meetings held each spring to review procedures and techniques. New staff will be trained in the field by experienced personnel.

**7.0 EQUIPMENT AND SUPPLIES**


- \_\_\_\_\_ Copy of this SOP
- \_\_\_\_\_ Writing utensils containing permanent ink
- \_\_\_\_\_ Appropriate sample collection containers, preservatives, and labels
- \_\_\_\_\_ Cooler with wet or dry ice (depending on sample type)
- \_\_\_\_\_ Chain-of-Custody Seals (**Figure 1**)
- \_\_\_\_\_ Chain-of-Custody Forms (examples in **Figure 2** – State Lab, and **Figure 3** – AWAL)

- *Hard copies of CoC forms and seals can be obtained from DWQ’s QA officer Jim Harris (801)536-4360.*
- *Electronic copies are located on the DWQ Shared Drive at U:\WQ\PERMITS\MONITORS\QAQC\Chain of Custody Forms\Legal Chain of Custody*
- *The most current forms can be found on the State Lab and AWAL websites.*

**Figure 1. Utah DWQ Chain-of-Custody Seal**



**Figure 2. Utah DWQ Chain-of-Custody Form for STATE LAB**


 <b>UTAH DEPARTMENT OF HEALTH</b>		<b>CHAIN OF CUSTODY</b>						
Unified State Laboratories: Public Health Bureau of Chemical and Environmental Services 4431 S 2700 W Taylorsville, UT 84129-8600 801 965 2400 Fax 801 969 3238 <a href="http://health.utah.gov/lab/chemistry">http://health.utah.gov/lab/chemistry</a>					<input type="checkbox"/> Hand Delivered <input type="checkbox"/> Shipped Samples <input type="checkbox"/> Cooler Returned			
System Agency Name:	System Agency Number:	Cost/Project Code:	<b>REQUESTED TESTS</b>			Received Date and Time:		
<b>REPORTING/CONTACT</b>		<b>BILLING (list if different)</b>			Receipt temperature	Receipt pH	<b>Sample Receipt Conditions</b>	
Attn: _____ Address: _____ City, State, Zip: _____ Phone: _____ Fax: _____ Email: _____ Submitted By: _____		Special Code: _____ Attn: _____ Address: _____ City, State, Zip: _____ Phone: _____ Fax: _____					Yes	No
<b>COLLECTION POINT DESCRIPTION</b>	<b>Collectors Initials</b>	<b>Collection Date (mm/dd/yy)</b>	<b>Collection Time (24 hr)</b>	<b>COMMENTS</b>				<b>LAB NUMBER</b>

Dispatched By:	Date and Time:	Courier Company Name:	Invoice/Anbill #:
Relinquished By:	Date and Time:	Received by:	Date and Time:
Relinquished to USL PH by:	Date and Time:	Received at USL PH by:	Date and Time:



**Figure 3. Utah DWQ Chain-of-Custody Form for AWAL.**

Client _____ Address _____ _____ City State Zip Phone _____ Fax _____ Contact _____ E-mail _____ Project Name _____ Project Number/P.O.# _____ Sampler Name _____		<b>AMERICAN WEST ANALYTICAL LABORATORIES</b> 463 West 3600 South Salt Lake City, Utah 84115 (801) 263-8686 (888) 263-8686 Fax (801) 263-8687 Email: awal@awal-labs.com	<b>CHAIN OF CUSTODY</b> Lab Sample Set # _____ Page _____ of _____ <b>Turn Around Time (Circle One)</b> 1 day 2 day 3 day 4 day 5 day Standard	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="width: 15%;">Date/Time Collected</th> <th rowspan="2" style="width: 5%;">Matrix</th> <th rowspan="2" style="width: 5%;">Number of Containers (Total)</th> <th colspan="10">TESTS REQUIRED</th> <th colspan="3">QC LEVEL</th> <th rowspan="2" style="width: 15%;">COMMENTS</th> <th colspan="1" style="width: 10%;">LABORATORY USE ONLY</th> </tr> <tr> <th>1</th><th>2</th><th>2+</th><th>3</th><th>3+</th><th>4</th><th>1</th><th>2</th><th>2+</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Date/Time Collected	Matrix	Number of Containers (Total)	TESTS REQUIRED										QC LEVEL			COMMENTS	LABORATORY USE ONLY	1	2	2+	3	3+	4	1	2	2+																																																																																																																																																																																																																																																																																																																																			
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## 8.0 PROCEDURE

### 8.1 General Guidelines (from EPA's Chain-of-Custody Training Module)

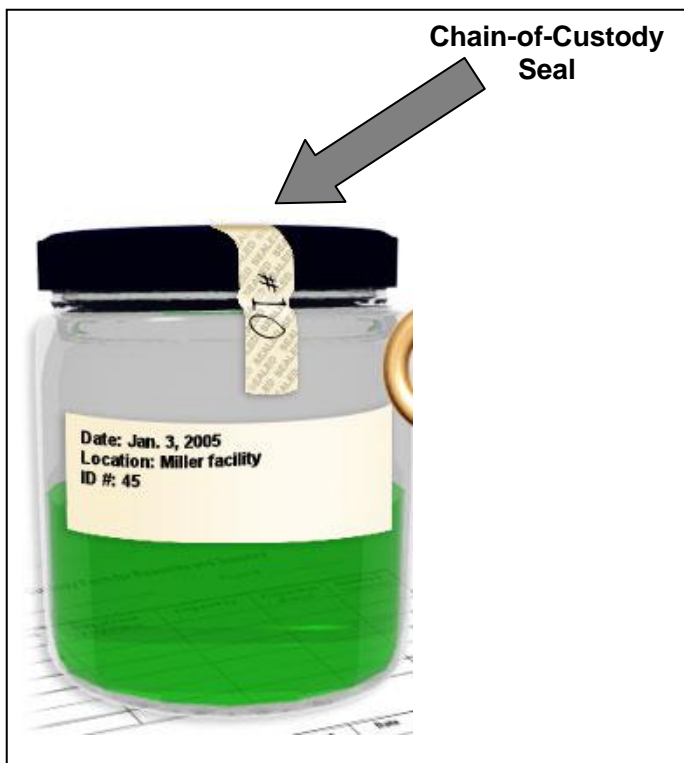
- Keep the number of people involved in collecting and handling samples and data to a minimum.
- Only allow people associated with the project to handle samples and data.
- Always document the transfer of samples and data from one person to another on chain-of-custody forms.
- Always accompany samples and data with their chain-of-custody forms.
- Give samples and data positive identification at all times that is legible and written with permanent ink.

### 8.2 Detailed Procedures

- Determine which laboratory will be utilized for sample analysis. Contact the laboratory to be sure you have the correct quantity and types of sample containers and preservatives and to determine which analyses to request. The laboratory will also provide trip blanks (for VOC samples) that you will need to pick up before sample collection. The two laboratories utilized most often by DWQ are the Utah Public Health Laboratory (State Lab) and American West Analytical Laboratories (AWAL).
  - *State Lab: (801) 965-2400*
  - *AWAL: (801) 263-8686 or toll free at (888) 263-8686*
- If you require laboratory quality control (QC) be run on *your* samples (for example to test for precision and matrix effects), you must make the laboratory aware of this by indicating the request on the CoC form and notifying the receiving personnel. Otherwise, QC will be run on a random sample in the analysis batch, which may or may not be from your samples. The lab will likely require you to collect extra sample volume or an additional set of sample bottles; consult the laboratory. For guidance on whether laboratory QC needs to be run on your samples, contact the DWQ QA Officer, Jim Harris at (801) 536-4360.
- Also, AWAL offers multiple levels of quality control (QC) for their data package and this must be indicated on the CoC form (see **Figure 2**). These QC levels are listed in **Appendix 2** of this SOP. For guidance on which QC level to choose, contact DWQ's QA Officer, Jim Harris at (801) 536-4360.

- Gather the appropriate CoC seals and forms.
- Before sample collection, be sure to check that all sample containers are within the expiration date.
- Be sure to label bottles completely using permanent ink. Bottles should be labeled with the site code (Monitoring Location ID (MLID) or STORET, if available), GPS coordinates (especially important if a site code does not exist or is not known), the site description, the date and time of collection, and the sampler's name or initials.
- Immediately after sampling, fill out CoC seals with the following information written in permanent ink: site code or MLID if available, GPS coordinates, the site description, the date and time of collection, bottle number (e.g. bottle 1 of 3) and the sampler's signature. Fix the CoC seals over the sample container lids and onto the sample container as in **Figure 4** below.

**Figure 4. Example of a CoC seal attached to a sample container.**



(Photograph source: EPA training module - <http://www.epa.gov/apti/coc/>)

- Next completely and accurately fill out the CoC form. Feel free to call the laboratory for help in filling out this form. Make sure that the information on the CoC form matches the information on the sample container labels and CoC seals. The CoC form should travel with the samples. Samples which may have high levels of contamination or may be hazardous to health should be indicated as such in the comments section of the CoC form. The CoC form should also indicate who will receive the completed data package. For guidance, contact DWQ's QA Officer, Jim Harris at (801) 536-4360.
- Put the sealed samples in a cooler of wet or dry ice, depending on the sample type. Ideally, CoC seals are placed on each individual sample container. Alternatively, one CoC seal may be placed on the sealed cooler containing the sample containers. This scenario may only be used when the sampler is planning to hand-deliver samples to the laboratory, does not have enough CoC seals for each sample container, and/or is concerned that the seals may be damaged by ice melting in the cooler. If samples are to be shipped, each individual sample container must have its own CoC seal.
- The field sampler must maintain custody of the samples (see **Section 3.0 – Definitions**), or if custody is transferred to another person, the transfer must be documented via signatures, dates, and times on the CoC form.
- The samples must be delivered to the laboratory as soon as possible and within sample holding times. If samples must be stored overnight, they must be placed in a locked, secure location and protected from outside temperatures and gaseous contaminants (such as from gasoline fumes in a garage). Ideally, samples kept overnight at DWQ should be stored in the MASOB first floor locked storage area.
- When dropping CoC samples off to the State Lab, call ahead and notify sample receiving so that the proper individual is sent to receive the samples (only certain individuals at the State Lab are qualified to sign for receipt of CoC samples).
- When samples are delivered to the laboratory, the person delivering the samples should go over the CoC form with the laboratory sample custodian to make sure it was filled out properly and that the appropriate analyses have been requested.
- Next, the sample deliverer signs over custody to the laboratory sample custodian.
- The laboratory sample custodian should verify the number of samples, their identification, and their integrity to make sure they have not been tampered with. Next, he or she should sign the CoC form, accepting transfer of custody of the samples. Any discrepancies in the condition of the samples are noted on the CoC form.

- The sample deliverer must verify with the laboratory that DWQ will receive a copy of the completed and signed CoC form. At the State Lab, a photocopy or digital photograph of the signed CoC form should be made at the time of sample delivery. For other labs, the laboratory should provide a photocopy or immediately send a scanned electronic file to DWQ ([lenoras@utah.gov](mailto:lenoras@utah.gov)). It is important that the QA Officer, Jim Harris, or Lenora Sullivan (DWQ's Database Manager) receive a copy of the CoC form so that DWQ knows when to expect the results for these important samples. In addition, a copy of the CoC should be included in the data results package.

### **8.3 Procedures for Shipping Chain-of-Custody Samples**

- In rare circumstances, samples may need to be shipped to the laboratory via a common courier such as FedEx. Contact DWQ's QA Officer, Jim Harris at (801) 536-4360 to obtain DWQ's FedEx account #. In these scenarios, the last person who had custody of the samples should sign off on the CoC form, and state in the comments section of the CoC form that the samples were given to a common courier. The CoC form is then placed in the shipping container with the samples. The shipping container (cooler or other packaging) should be sealed with tape and a CoC seal (made tamper-proof by placing over the shipping container lid). The shipping container can then be transferred to the courier.
- The CoC documentation for samples while in the courier's possession is the shipping record used by the courier. All samples should be shipped for next-day delivery; if shipping samples on a Friday, contact the laboratory to make sure it is staffed for Saturday delivery.
- The laboratory receiving the samples will check the integrity of the shipping container CoC seal upon receipt. If the seal is broken, the laboratory sample custodian must indicate the broken seal on the CoC form.
- The laboratory must provide a copy of the signed CoC form to the sample collector (or other entity receiving the data results package).

## **9.0 DATA AND RECORDS MANAGEMENT**

Instructions for data and records management are included throughout **Section 8.0 (Procedure)** of this SOP. It is essential that all CoC documentation be filled out accurately and completely.

For DEQ employees, there is a shared spreadsheet for tracking of Chain-of-Custody samples. Please complete this tracking sheet for the samples you collected as soon as possible after sample collection.

## 10.0 QUALITY ASSURANCE AND QUALITY CONTROL

A trip blank (prepared by the laboratory) should be collected when sampling for VOCs. Consult the applicable Sampling and Analysis Plan or DWQ SOP for frequency and type of other quality control samples to be collected.

## 11.0 REFERENCES

EPA has a helpful on-line training module at: <http://www.epa.gov/apti/coc/>.

American West Analytical Laboratories (AWAL) has useful guidance as well as information about sample containers, preservatives, and analysis types on their website at <http://www.awal-labs.com/>.

The Utah State Lab Client Manual contains information about sample containers, preservatives, and analysis types and can be found on their website at <http://health.utah.gov/lab/chemistry/documents/ClientServicesManualCombined.pdf>.

### **Related DWQ SOPs:**

Standard Operating Procedure for Collection of Lake Water Samples

Standard Operating Procedure for Collection of Water Chemistry Samples

## **12.0 APPENDICES**

**Appendix 1 – SOP Acknowledgment and Training Form (front and back)**

This SOP must be read and this form signed annually. This form must be kept with the current version of the SOP.

Document Title:	
Document Revision Number:	
Document Revision Date:	

Please sign below in accordance with the following statement: “I have read and understood the above referenced document. I agree to perform the procedures described in this SOP in accordance with the document until such time that it is superseded by a more recent approved revision.”

Printed Name	Signature	Date



**SOP Acknowledgement and Training Form (continued)**

Trainee: Sign below to acknowledge that training on this SOP was received, understood, and all questions/concerns were addressed by the trainer.

Trainer: Sign below to acknowledge that training on this SOP was completed for the individual listed and that trainee is competent to perform the procedures described within.

Date of Training	Trainee Printed Name	Trainee Signature	Trainer Printed Name	Trainer Signature

<b>Management Approval</b>				
Printed Name:				
Signature:				
Date:				

**Appendix 2 – AWAL QC Levels for Data Packages**

**AWAL Quality Control Levels**

QC Item	Level 1	Level 2	Level 2+	Level 3	Level 3 Plus	Special Services+
Chain of Custody (COC)	X	X	X	X	X	X
Analytical Results	X	X	X	X	X	X
Narrative				X	X	
Surrogates	X	X	X	X	X	
Method Blank (MB)		X	X	X	X	
Laboratory Control Sample (LCS)		X	X	X	X	
Matrix Spike (MS)		X	X*	X*	X*	
Matrix Spike Duplicate (MSD)		X	X*	X*	X*	
Sample Duplicates		X	X	X	X	
Chromatograms				X	X	
Raw Data**					X	
Electronic Data Deliverable (EDD)#	O	O	O	O	O	

\* The MS/MSD performed on field sample from the client that requested this QC level.

\*\* Includes: run logs, prep logs, mass spectra, std. calibrations, other pertinent documentation.

# Please specify the format.

O = Optional

X = Included

+ AWAL offers custom services. Call for more information: 801-263-8686.