

CREATING AND MAINTAINING CHAIN OF CUSTODY

Purpose This Water Quality & Hydrology Group (ENV-WQH) procedure describes the process for establishing and maintaining the proper chain of custody in the collection, management, and processing of ENV-WQH samples.

Scope This procedure applies to the control and tracking of samples collected by ENV-WQH personnel or contractors.

In this procedure This procedure addresses the following major topics:

Topic	See Page
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First authorization review date is one year from Group Leader signature below; subsequent authorizations are on file in group office.

Signatures

Prepared by. Signature on file Penny Gomez, ENV-WQH	Date: 4/6/06 _____
Approved by. Signature on file Ken Mullen, ENV-WQH IM Team Leader	Date: 4/6/06 _____
Approved by. Signature on file Steve Rae, ENV-WQH Group Leader	Date: 4/6/06 _____

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General Information About This Procedure

Attachments This document has the following attachments:

Number	Attachment Title	No. of pages
1	Sample Chain of Custody Form	1
2	ENV-WQH Chain of Custody System User Manual	18

History of revision

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description Of Changes
0	1/04	New document.
1	5/05	Annual review changes
2	4/05	Annual review changes

Who requires training to this procedure

The following personnel require training before implementing this procedure:

- Personnel assigned to collect, package, and transport samples.

Training method

The training method for this procedure is “self-study” (reading) and is documented in accordance with the procedure for training (ENV-WQH-QP-024, *Personnel Training*).

General Information About This Procedure, continued

Definitions to this procedure	<p>Chain of Custody: The requirement for demonstration of possession of a sample by only authorized individuals. The chain of custody (COC) process provides confidence and documentation in analytical data integrity by establishing the traceability of the data from the time of collection, to delivery, through processing, to final maintenance as a record.</p> <p>IM Team: The ENV-WQH Information Management Team (IM Team) works with data stewards to translate their sampling and QC requirements into a consistent format easily accessible to those collecting the samples.</p> <p>The IM Team captures relevant information from completed COC forms and field notes in the WQDB for sample tracking purposes. The COC database application is maintained by the IM team.</p> <p>ER SMO: The Environmental Restoration Project Sample Management Office (ER SMO) provides shipping for all samples. They also provide other services on occasion.</p> <p>EDD: An electronic data deliverable (EDD) is a data file containing chemistry results from an analytical laboratory. It is in a specific format outlined by the IM Team.</p> <p>Field Parameters: These are measurements and observations taken from samples in the field including, but not limited to, turbidity, conductance, pH, temperature, water level, and whether a visual inspection was performed.</p>
Policies	<p>Samples will be controlled to maintain legally defensible data and to prevent cross contamination or data loss.</p> <p>The following documents are specific to this procedure:</p> <ul style="list-style-type: none">• ENV-WQH-QP-025, <i>Records Management</i>• ENV-WQH-QP-027, <i>Managing Electronic Data</i>• ENV-DO-206, <i>Sample Containers and Preservation</i>• ENV-DO-207, <i>Handling, Packaging, and Transporting Field Samples</i>
Note	<p>Actions specified within this procedure, unless preceded with “should” or “may,” are to be considered mandatory guidance (i.e., “shall”).</p>

Creating a Chain of Custody

Using the sampling schedule

Sampling activity is scheduled annually for planned and sampling and periodically for new programs and projects. That schedule is maintained in the Water Quality Database (WQDB). The sampling schedule is loaded into the database and will assign analytes, methods, bottles, preservatives, QC samples, and field parameters to a specific sample location.

All WQH sampling personnel have access to the sampling schedule through Oracle Discoverer. COC forms are customized for each sampling activity with pre-assigned chain of custody numbers, sample identification numbers, and other information required for sample collection, shipping, and analysis. See Attachment 1 for a sample COC form.

For the WQDB to generate COCs for new or unplanned sampling, provide the following information to the IM Team:

- Project cost code
- Source organization and data steward
- Field matrix
- Field prep
- Analytical laboratory
- Location name
 - If new location, provide X, Y coordinates
- Sample technique
- Analysis, method, and specific analytes
- Field parameters to be collected
- Sampling Frequency
- Campaign

At time WQH may help other groups with sampling activities. If a sampling plan cannot be made or maintained in the WQDB, the COCs will follow the same procedures as unplanned sampling and use an older version of a COC that is set up through an existing Excel spreadsheet.

Creating a Chain of Custody, continued

Initiating COC

A COC is initiated by the **sampler**. When assigned a sampling activity, the sampler shall perform the following steps in initiating a COC.

Step	Action
1	Print the COC form for the sample to be taken from the WQDB. For specific instructions on accessing the WQDB and using the WQH Chain of Custody Application, reference Attachment 2.
2	If any items are missing or incorrect on the COC they must be fixed prior to sampling. All changes need to go through the WQDB. If there are any problems or questions, contact the IM Team.

Maintaining Custody of Samples

Policy

A sample is physical evidence collected from a facility or the environment.

Chain of custody must be documented for all samples to verify that the possession and handling of samples is traceable at all times. A sample is considered in custody if it is one of the following:

- In one's physical possession.
- In one's view after being in one's physical possession.
- In one's physical possession and then locked up so that no one can tamper with it.
- Kept in a secure area where access is restricted to authorized and accountable personnel only.

NOTE: A secured area is an area that is locked, such as a room, cooler, vehicle, or refrigerator. If the area cannot be secured by locking, use a custody seal to secure the area or the sample container.

Completing COC Form

COC forms shall be completed immediately when samples are taken.

The **sampler** shall provide all information on the form in a legible format and in indelible ink.

Mandatory information for the COC includes:

Mandatory COC information:
Unique COC identification number
Unique sample identification number(s)
Analytical lab where samples are to be sent
Matrix
Program
Cost Code
Container description
Number of containers
Preservatives
Name of lead sampler (sampler who assumes custody and control) and all other samplers present (provided by sampler)
Date and time of sampling (provided by sampler)
Date and time sample was relinquished for shipping (provided by sampler)

Non-mandatory information on the COC may include field parameters, any problems with the sampling, and special instructions for the laboratory such as turn-around-times, reporting, and QC compositing.

Maintaining Custody of Samples, continued

Completing COC Form, Continued

If a sample is not collected, the **sampler** shall cross out the sample with a single line, initial and date the cross out, and give a reason the sample was not collected. The table below lists database-allowable reasons for not collecting a sample. If there is a new reason, contact the IM Team to add it to the database.

The **sampler** shall give a copy of the COCs with deletions and reasons to the IM Team. If data needs to be added, or modified in any way, contact the IM Team at email address referenced above. All additions, deletions, or changes of any kind, must go through the database for sample tracking purposes.

SAMPLE_STATUS_DESC
Area inaccessible
Area inaccessible-poison ivy
Area inaccessible-rattle snakes
Area inaccessible-rodent infested
Area temporarily off limits
Cancelled per project leader
Cancelled, did not follow procedure
Cancelled, due to weight limitations
Cancelled, insufficient budget
Cancelled, insufficient sample available
Cancelled, no snowmelt
Cancelled, removed from plan
Dry
Lab Error
Location frozen
Mechanical problem
No power
Not marked and could not find
Out of service-permanent
Out of service-temporary
Shipping Problem-broken containers
Shipping Problem-hold time issues
Shipping Problem-temperature
Source destroyed
Spring under water
Water level below pump
Well was not installed when sampling was scheduled
bottle broken in field
bottle missing in field
hold time expired before sample submission
port not operable yet
sample requires recollection
unnecessary qc removed from plan

Maintaining Custody of Samples, continued

Transferring custody To transfer samples into the custody of another person or organization, the **sampler** shall perform the following steps:

Step	Action
1	Complete the “relinquished by/received by” and “date” sections of the form (Attachment 1). These sections of the form must provide a complete history of custody of the samples from collection to transfer to the analytical laboratory.
2	Ensure that samples are custody sealed when relinquished. Chain of custody tape shall be placed on each sample bottle so if the bottle is opened, the tape will tear.
3	Lead sampler initials the tape on each container.
4	Any tampering after the sample is relinquished should be documented by the receiving agency.
5	Submit the original COC form with the samples.

Transferring custody to ER-SMO All samples are relinquished to ER-SMO for shipping. ER-SMO personnel will verify that samples submitted correspond with what is on the COC. ER-SMO must sign the COC to indicate acceptance of the samples, then send and relinquish it to the appropriate analytical laboratory.

If COC is broken Whenever there is a break in the chain of custody of a sample, document the failure by initiating a deficiency report in accordance with ENV-WQH-QP-033, *Issues Reporting and Action Tracking*. The deficiency process will document the occurrence, evaluate the potential impact (if any) on the samples, and propose a fix to prevent recurrence.

Maintaining Custody of Samples, continued

Relinquish- ing samples for shipping

When the sampling is complete and the COC is properly filled out, the samples will follow the process set forth in ENV-DO-207, *Handling, Packaging, and Transporting Field Samples*, and be turned into the ER SMO for shipment to the analytical laboratory. The samples are then relinquished to the ER SMO sample custodian through the COC.

The **ER SMO** shall make two copies of the COC form. The original is submitted with the samples. One copy of the completed COC form is given to the individual submitting the samples and the second copy is faxed to the analytical laboratory. The **sampler** shall submit the first copy of the COC together with field notes containing the field parameters to IM Team.

The analytical laboratory will include a scanned image of the original COC form in the electronic data package and/or will include the original COC form in the hard copy data package, depending on the program. These are available on the ENV-WQH server at: ENV-WQH on '128.165.174.200'(S:)/ Data Packages. In addition, all copies given to the IM Team by the sampler are stored locally for one year before being sent to the Records Room..

All records are maintained in accordance with RRES-WQH-QP-025, *Records Management*.

Using field notes

All persons present at the sampling event, or who later handle the samples prior to being custody sealed, shall be identified in the field notes.

The IM Team stores copies of all COCs and field notes that contain field parameters and water levels.

Completing COC process (releasing field parameters)

Confirm sample collection

The **sampler** shall complete the COC process after the IM team has completed the sample tracking. The sampler and IM Team shall perform the following steps:

Step	Action
1	Sampler shall drop off copy of COC and field notes including water levels if appropriate to the IM Team.
2	The IM Team will complete the sampling event in the database using the COC and field notes: <ul style="list-style-type: none">• Samples are marked as being collected as planned or if a sample was not collected a reason is given.• All field parameters including water levels are entered.
3	The lead sampler shall verify that the field parameters were entered correctly into the WQDB and either change or release the data. For specific instructions on accessing and using the Instruction for Confirming Field Parameters in the ENV-WQH Chain of Custody System, see Attachment 2.

Confirm data package receipt

When a data package with EDD and original COC is received, the date is entered in the database for tracking purposes.

Records resulting from this procedure

Records

The following records generated as a result of this procedure are:

- Chain of custody forms (also location sheet and container labels)
- Field notes
- Hard copy data package (for some programs)
- Electronic data deliverable (EDD)
- PDF Data Package

[Using a CRYPTOCard, click here to record "self-study" training to this procedure.](#)

If you do not have a crypto card, contact creichel@lanl.gov for instructions on getting credit.

SAMPLE CHAIN OF CUSTODY FORM

Los Alamos
NATIONAL LABORATORY

Request For Analytical Services
ENV-WQH

***** DRAFT *****

<p>Matrix: Ground Water Doc ID: PG #: Program: Snd Mon Case Code: 4237 Collection Date/Time:</p>	<p>Ship To: General Engineering Laboratories, Inc., Charleston, SC 2040 Savage Rd. Charleston, SC 29407</p>	<p>WQH Contact: Bar Vanden Plus Los Alamos National Laboratory MS K497 DDP 5901170 IU Los Alamos, NM 87545</p>
<p>Contact: Vince Cleva Phone: (843) 556-8171 Fax: (843) 766-1178</p>	<p>Phone: 1-505-667-0675 Fax: 1-505-665-9344 Email: barvwang@lanl.gov</p>	<p>Sampler Initials: _____ Date: _____</p>

Analysis Request

Sample ID	Order Suite Desc	Field Prop:	UF	Container Desc	Qty	Preservative Desc	PAF	WQH Comment	Analytical Lab Comments
453	WG, WM, WP, 3021A PEST			10L amber glass	1	-4C			
4108	WG, WM, WP, 3021A PEST wWS			10L amber glass	3	-4C			
Total Containers:				4					
Grand Total:								4	

Technique:

Comments:

Chain of Custody

Sampling Team:	Date	Time	Received By:	Date	Time	Reason for Transfer
Requisitioned By:			(signature)			

ENV-WQH

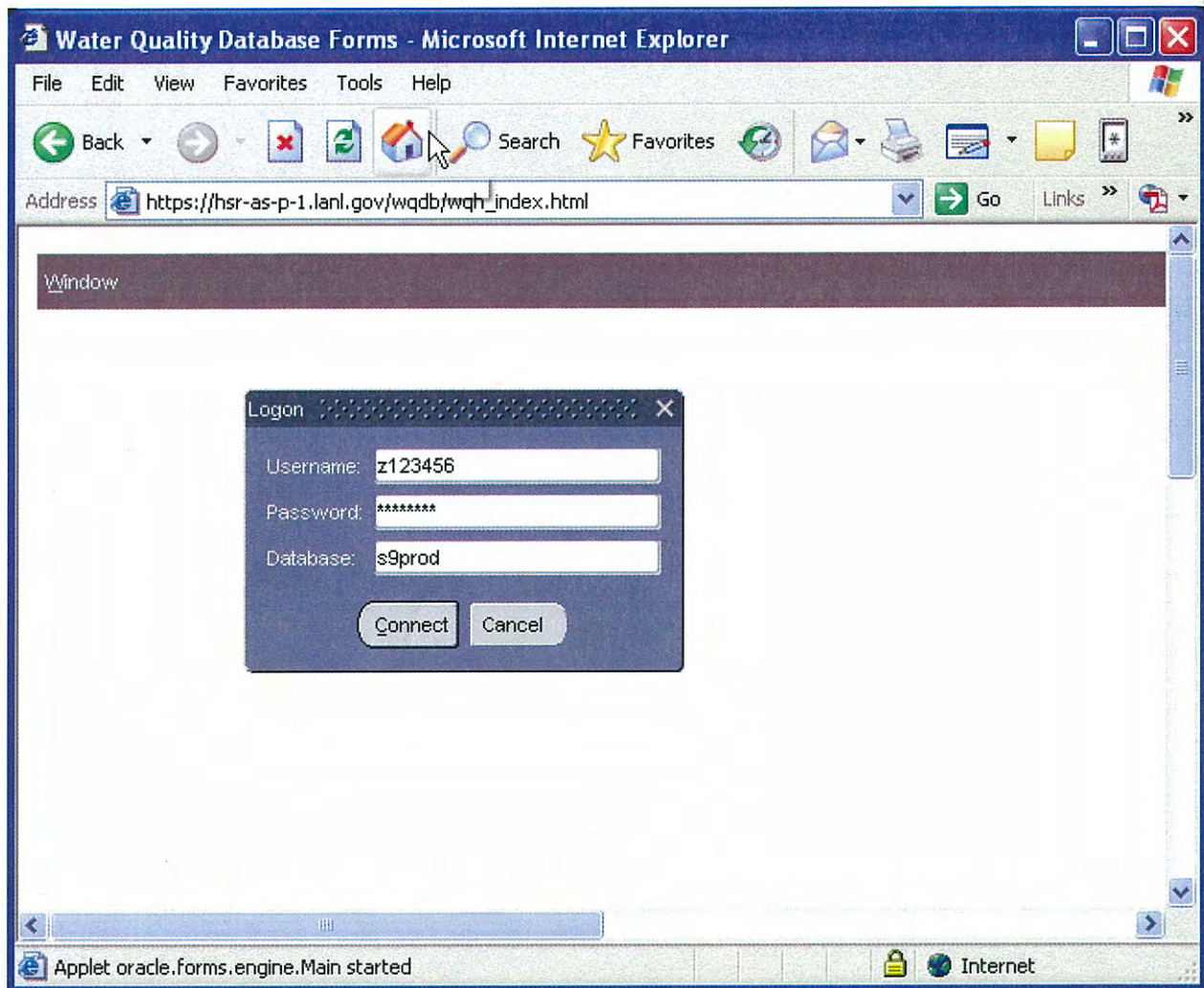
Chain of Custody System

Users Manual



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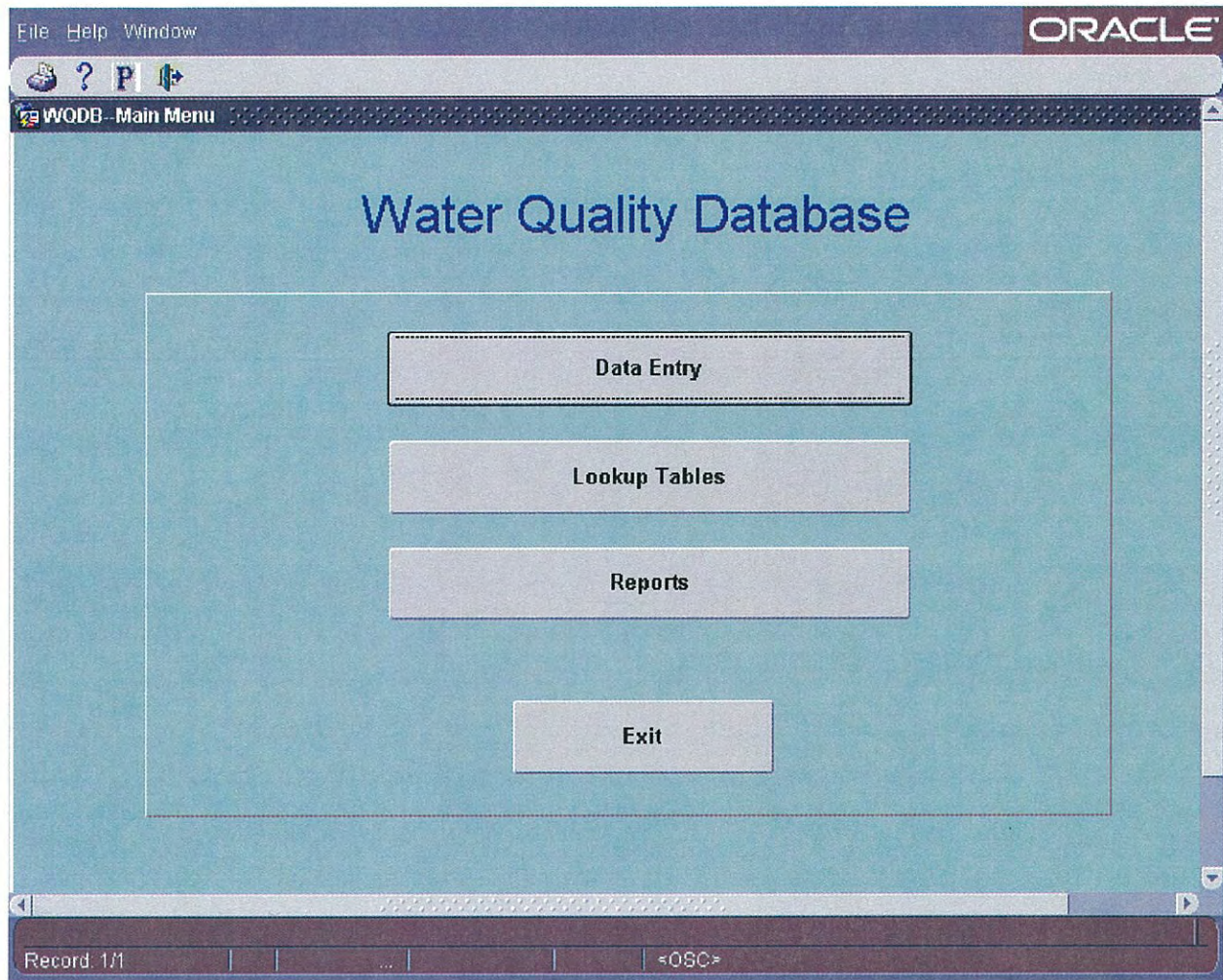
Instruction for Generating Chain of Custody Forms, Labels, and Location Sheet



From your browser, connect to the Chain of Custody Application by entering:
https://hsr-as-p-1.lanl.gov/wqdb/wqh_index.html

Log onto application by entering:
Username: "z" followed by your z-number
Password: this will be assigned to you
Database: s9prod

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When you see this screen, click on the “Data Entry” button.

File Help Window ORACLE

WQDB: Data Entry

Data Entry Menu

Module: SAMPLE

Form Name: Chain of Custody

Description: Chain of Custody -- TEST VERSION -- In progress...

Run Form

Record: 1/1 <OSC>

When you see this screen select:
Module: SAMPLE
Form Name: Chain of Custody
Then click the “Run Form” button.

File Help Window ORACLE

CHAIN OF CUSTODY

Matrixes

Field Matrix: Storm Water

Location: E040

RETRIEVE CONTAINERS

Location

Name

Synonym

FORMS

COC TRACKING

FIELD DATA

Container Records

Freq Code	Priority	Order Suite Description	Field Prep	Volume	UOM	COC ID
<input checked="" type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						

CONTAINERS

SELECT ALL

Current Only

All

COC

REVIEW

GENERATE

REPRINT

CHAIN OF CUSTODY

LABELS

LOCATION SHEET

Record: 1/1 <OSC>

When you see this screen:

1. Choose the appropriate Field Matrix.
2. Choose the appropriate Location. Locations may be chosen using the name or synonym.
3. Click on the "Retrieve Containers" Button.

File Help Window ORACLE

CHAIN OF CUSTODY

Matrixes

Field Matrix: Storm Water

Location: E040

Location: Name Synonym

RETRIEVE CONTAINERS ENTER AMOUNT

FORMS

COC TRACKING

FIELD DATA

Container Records

Freq Code	Priority	Order Suite Description	Field Prep	Volume	UOM	COC ID
<input type="checkbox"/> Q2.1	1	RO: TSS(M)	UF	1	L	
<input type="checkbox"/> Q2.1	2	GW, SW, RO: H-3	UF	.25	L	
<input type="checkbox"/> Q2.1	2	RO: Rad	F			
<input type="checkbox"/> Q2.1	2	RO: Rad	UF			
<input type="checkbox"/> Q2.1	3	RO: Metals	UF			
<input type="checkbox"/> Q2.1	3	RO: Metals, Gen	F			
<input type="checkbox"/> Q2.1	3	SW, RO: Hg	F			
<input type="checkbox"/> Q2.1	3	SW, RO: Hg	UF			
<input type="checkbox"/> Q2.1	4	GW, SW, WQCC, RO: ClO4	UF			
<input type="checkbox"/> Q2.1	4	RO: CN	UF	.25	L	
<input type="checkbox"/> Q2.1	4	RO: Gen Inorg II	F	1	L	
<input type="checkbox"/> Q2.1	4	RO: Gen Inorg III	UF	1	L	
<input type="checkbox"/> Q2.1	4	RO: LOI, Condc.	UF	1	L	
<input type="checkbox"/> Q2.1	5	RO, GW: DRO	UF	1	L	
<input type="checkbox"/> Q2.1	5	SW, RO: SVOA	UF	1	L	
<input type="checkbox"/> Q2.1	6	SW, RO: PCB	UF	1	L	

Enter Amount

ENTER NUMBER OF LITERS

15

DONE

CONTAINERS

SELECT ALL

Current Only All

COC

REVIEW

GENERATE

REPRINT

CHAIN OF CUSTODY

LABELS

LOCATION SHEET

Record: 1/1 <OSC>

If a matrix of Storm Water is chosen, you have the option of entering the amount of water collected. This number will be used to calculate what analyses should be requested.

File Help Window ORACLE

CHAIN OF CUSTODY

Matrixes

Field Matrix:

Location:

Location

Name

Synonym

FORMS

Container Records

Freq Code	Priority	Order Suite Description	Field Prep	Volume	UOM	COC ID
<input checked="" type="checkbox"/> Q2.1	1	RO: TSS(M)	UF	.1	L	
<input checked="" type="checkbox"/> Q2.1	2	GW, SW, RO: H-3	UF	25	L	
<input checked="" type="checkbox"/> Q2.1	2	RO: Rad	F	4	L	
<input checked="" type="checkbox"/> Q2.1	2	RO: Rad	UF	4	L	
<input checked="" type="checkbox"/> Q2.1	3	RO: Metals	UF	1	L	
<input checked="" type="checkbox"/> Q2.1	3	RO: Metals, Gen	F	1	L	
<input checked="" type="checkbox"/> Q2.1	3	SW, RO: Hg	F	25	L	
<input checked="" type="checkbox"/> Q2.1	3	SW, RO: Hg	UF	25	L	
<input checked="" type="checkbox"/> Q2.1	4	GW, SW, WQCC, RO: ClO4	UF	25	L	
<input checked="" type="checkbox"/> Q2.1	4	RO: CN	UF	25	L	
<input checked="" type="checkbox"/> Q2.1	4	RO: Gen Inorg II	F	1	L	
<input checked="" type="checkbox"/> Q2.1	4	RO: Gen Inorg III	UF	1	L	
<input checked="" type="checkbox"/> Q2.1	4	RO: LOI, Condc.	UF	1	L	
<input type="checkbox"/> Q2.1	5	RO, GW: DRO	UF	1	L	
<input type="checkbox"/> Q2.1	5	SW, RO: SVOA	UF	1	L	
<input type="checkbox"/> Q2.1	6	SW, RO: PCB	UF	1	L	

CONTAINERS

Current Only

All

COC

REPRINT

Record: 1/1 <OSC>

For storm water, entering the amount of water collected will select the analyses to be requested. You still have the option to select or unselect any containers.

Matrixes

Field Matrix: Ground Water

Location: WCO-1

Location

Name

Synonym

FORMS

COC TRACKING

FIELD DATA

RETRIEVE CONTAINERS

Container Records

Freq Code	Priority	Order Suite Description	Field Prep	Volume	UOM	COC ID
<input checked="" type="checkbox"/> A1		GW, SW, RO: H-3	UF	25	L	
<input checked="" type="checkbox"/> A1		GW, SW, RO: HE	UF	1	L	
<input checked="" type="checkbox"/> A1		GW, SW, RO: TSS	UF	.5	L	
<input checked="" type="checkbox"/> A1		GW, SW, WQCC, RO: ClO4	UF	25	L	
<input checked="" type="checkbox"/> A1		GW, SW: Gen Inorg III	F	25	L	
<input checked="" type="checkbox"/> A1		GW: CN	UF	25	L	
<input checked="" type="checkbox"/> A1		GW: Gen Inorg I	F	1	L	
<input checked="" type="checkbox"/> A1		GW: Gen Inorg II	F	1	L	
<input checked="" type="checkbox"/> A1		GW: Hg, Se	UF	25	L	
<input checked="" type="checkbox"/> A1		GW: Metals	F	1	L	
<input checked="" type="checkbox"/> A1		GW: Metals	UF	1	L	
<input checked="" type="checkbox"/> A1		GW: Rad	UF	4	L	
<input checked="" type="checkbox"/> Q2		FLD DATA	UF	0	L	
<input checked="" type="checkbox"/> Q2		GW: water level	NA	0	L	
<input checked="" type="checkbox"/> T1		GW: PCB	UF	1	L	
<input checked="" type="checkbox"/> T1		GW: SVOA	UF	1	L	

CONTAINERS

UNSELECT ALL

Current Only

All

COC

REVIEW

GENERATE

REPRINT

CHAIN OF CUSTODY

LABELS

LOCATION SHEET

Record: 1/18

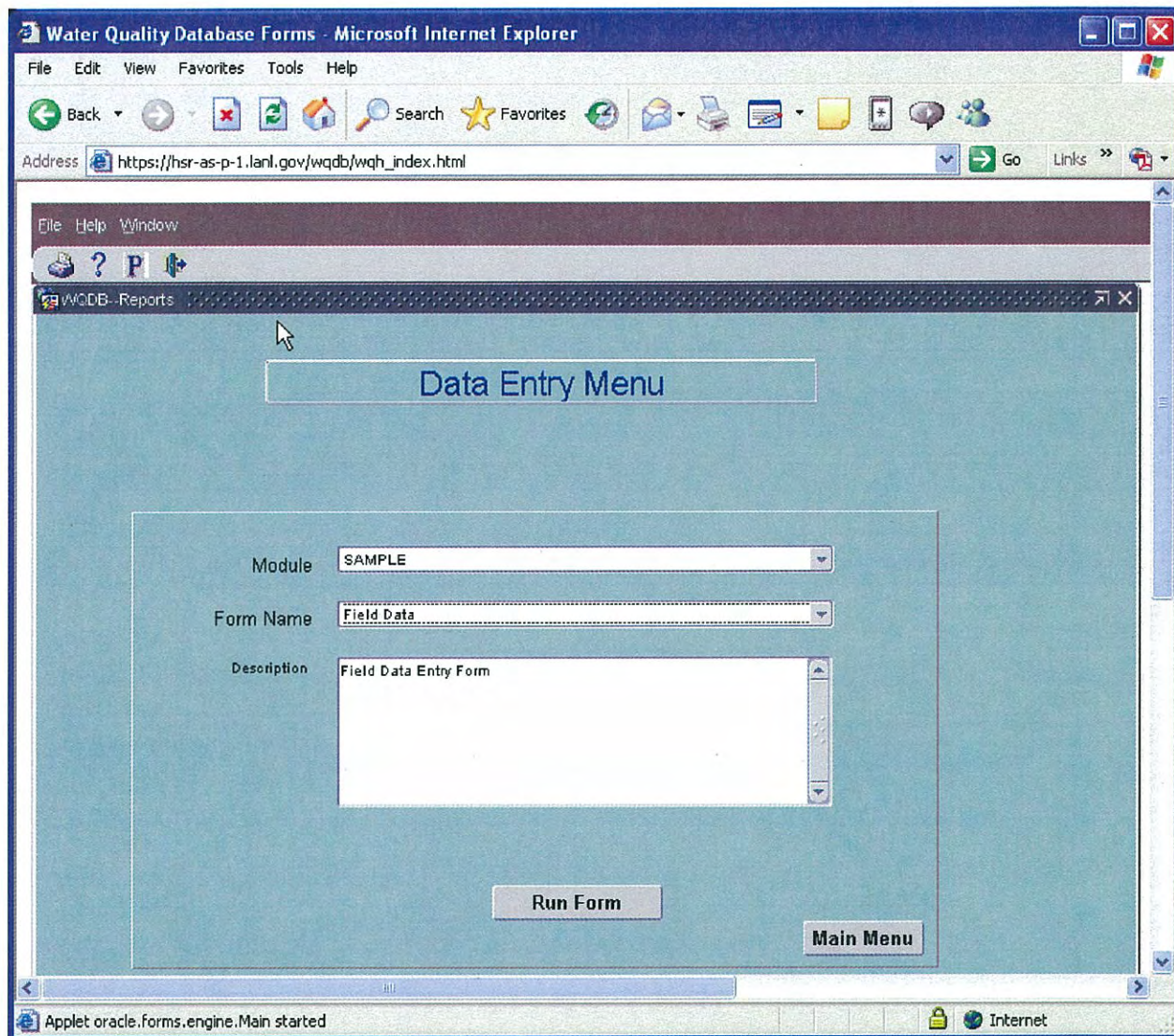
<OSC>

For all other matrices, you will typically want to choose “Current Only” and “Select All” under “Containers”. This will select all containers that need to be collected at that time.

1. Click on the “Generate” Button.
2. A location sheet, and Chain of Custody form(s) will display as PDF’s. Print these. The labels will automatically print out at the Zebra printer.

You will now have a chain of custody form, container labels, and location sheet. After collecting, submit a copy of the completed chain of custody forms and field notes to the Information Management (IM) Team. The IM Team will use the chain of custody forms to confirm in the database that all containers were collected and submitted. If a container is not collected or submitted, please draw a line through that container on the COC form and give a reason why it was not collected. If no samples are collected give a reason why and indicate the reason. The field notes will be used to enter the field parameters, water level, and if a visual inspection was performed.

Instruction for Confirming Field Parameters



From your browser, connect to the Chain of Custody Application by entering:
https://hsr-as-p-1.lanl.gov/wqdb/wqh_index.html

Log onto application by entering:

Username: "z" followed by your z-number

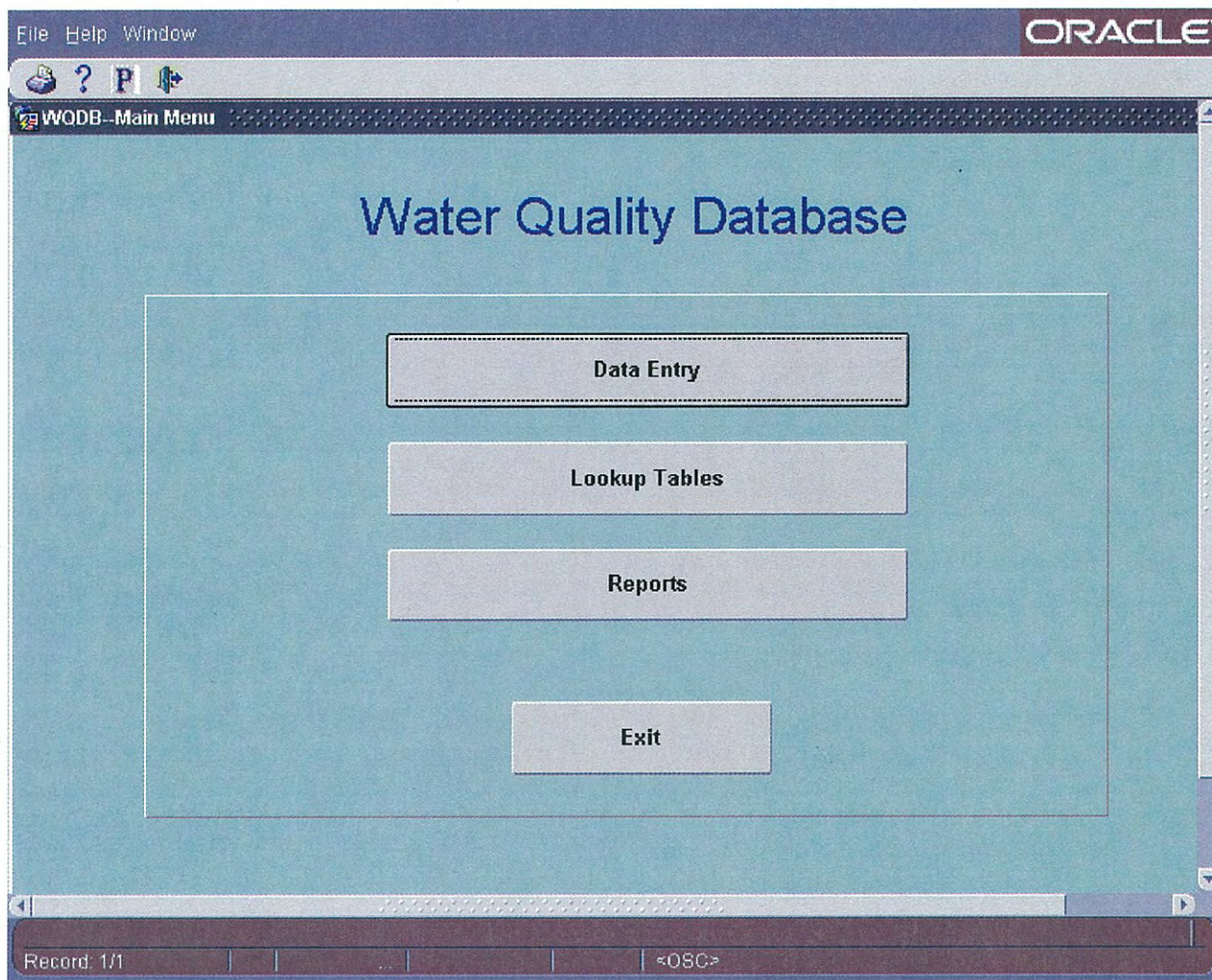
Password: this will be assigned to you

Database: s9prod

Username: "z" followed by your z-number

Password: this will be assigned to you

Database: sf8ip



When you will see this screen, click on the “Data Entry” button.

The screenshot shows a web-based Oracle application window titled "WQDB - Data Entry". The window has a menu bar with "File", "Help", and "Window". The main content area is titled "Data Entry Menu" and contains a form with the following fields:

- Module:** A dropdown menu with "SAMPLE" selected.
- Form Name:** A dropdown menu with "Enter Field Data" selected.
- Description:** A text area containing "Enter Field Data -- TEST VERSION -- In progress...".

Below the form is a "Run Form" button. The status bar at the bottom of the window displays "Record: 1/1" and "<OSC>".

When you see this screen select:
Module: SAMPLE
Form Name: Chain of Custody
Then click the "Run Form" button.

The screenshot shows an Oracle application window titled "COC Tracking". The interface includes a "Selection" section with dropdown menus for "Field Matrix" (set to "Ground Water") and "Location" (set to "WCO-1"). There are radio buttons for "Name" and "Synonym", and buttons for "RETRIEVE" and "SAVE". To the right, under "FORMS", are buttons for "CHAIN OF CUSTODY" and "COC TRACKING". Below this is a "Field Data" section containing a table with the following data:

Location	Date Time	Analyte	Analyte Meth Code	Result	UOM	Visual	Rel Flag
WCO-1	05/02/2002	SPEC_CONDC	GENERIC FIELD CONDUCTIVITY	300	uS/cm		<input checked="" type="checkbox"/>
WCO-1	05/02/2002	TEMP	GENERIC FIELD TEMP	20	C		<input checked="" type="checkbox"/>
WCO-1	05/02/2002	TURB	GENERIC FIELD TURB	47	NTU		<input checked="" type="checkbox"/>
WCO-1	05/02/2002	VI	GENERIC FIELD VI			Y	<input checked="" type="checkbox"/>
WCO-1	05/02/2002	Water Level	Generic:Tape	13	FT		<input checked="" type="checkbox"/>
WCO-1	05/02/2002	pH	GENERIC FIELD PH	7			<input checked="" type="checkbox"/>
							<input type="checkbox"/>
							<input type="checkbox"/>
							<input type="checkbox"/>
							<input type="checkbox"/>
							<input type="checkbox"/>
							<input type="checkbox"/>
							<input type="checkbox"/>
							<input type="checkbox"/>

The status bar at the bottom indicates "Record 6/6" and "<OSC>".

1. Chose the “Field Matrix” and “Location” for the samples you want to confirm/release.
2. Click on the “Retrieve” button.
3. Correct any incorrect results.
4. Click on the release flag for each result.
5. Click the “Save” button.