

CCP-TP-177

Revision 0

CCP

Sample Receipt, Custody, and Storage

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RECORD OF REVISION

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0	05/02/2007	Initial Issue.

1. PURPOSE

This Central Characterization Project (CCP) procedure provides instruction for sample receipt, control and storage at the Environmental Chemistry Laboratory (ECL) to satisfy sample custody requirements. The general procedures described in this procedure may be used for other ECL projects requiring sample custody tracking.

Personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan*, prior to performing this procedure.

2. SCOPE

This procedure is used to ensure the integrity of samples from point of receipt to disposal. Chain-of-Custody (COC) documentation is maintained for all samples received for analysis by the ECL. A sample is under custody if one of the following conditions apply:

- It is in your possession
- It is in your view after being in your possession
- It was in your possession and you locked it in a secure area or secured it with a signed (or otherwise traceable) custody seal
- It is in a designated secure area.

All CCP gas samples accepted for analysis at the ECL are accompanied by COC documentation from the point of origin. Custody is maintained at the ECL by storing the samples in a secure area, CFA-625, which is access-controlled.

3. DEFINITIONS

Analytical Request Form. A form generated for each receiving group providing information on field and laboratory sample numbers, requested analyses, and reporting requirements.

Chain-of-Custody (COC). A set of procedures established to ensure that sample data integrity is maintained.

Day. Unless otherwise specified, day shall mean calendar day.

Field Duplicates. Two separate, independent samples collected from the same source, as close as possible to the same place and time, stored in separate containers, and analyzed independently.

Field Blanks. Field QC samples consisting of ambient air, collected to monitor potential contamination during the sample collection process.

Receiving Group. A set of samples received on the same day which are grouped together for purposes of analysis, tracking, and reporting.

Needle Assembly Equipment Blanks. QC samples collected to monitor cleanliness of sampling needle assemblies.

Sample. A portion of material to be analyzed that is contained in single or multiple containers and identified by a unique sample number.

Sample Custodian. An individual assigned and trained to receive, log and track samples for the ECL. Only sample custodians may receive and log samples.

Sample Number. A unique identification number assigned to each sample. The sample number appears on all sample reports that document information on that sample. Each sample normally has two associated sample numbers:

Field Sample Number. A unique identification number assigned to the sample at collection.

Laboratory Sample Number. A unique identification number assigned to the sample upon receipt at the ECL. ECL sample numbers consist of an 8-digit number base in the following format YYJJJXXX, where YY is the last two digits of the calendar year, JJJ is the Julian date, and XXX is a sequential number starting with 001 assigned to samples received on a single day. If the sample is to be composited for any of the requested analyses, a 3-character suffix, CNT, is assigned, where C stands for “composite”, N indicates the nth sample in the composite, and T indicates the total number of samples in the composite. If ten to twenty samples are included in a composite, the letters A through K are used for N and T (e.g., A = 10, B = 11, K = 20).

Sample Tag. A tag affixed to a sample container at collection, which lists sample ID and collection information and represents physical evidence that a sample was collected.

SUMMA[®] Canister. A stainless steel pressure vessel with SUMMA[®] passivated interior surfaces for the collection and storage of gas samples. The SUMMA[®] passivation process involves the formation of chromium-nickel oxide on the interior surface of the canister. This type of canister is used for stable storage of many specific organic compounds.

Traveler. A folder providing sample information and analytical requirements, which accompanies a batch of samples through the laboratory and in which copies of all raw data associated with the samples are placed for reporting and archival purposes.

Validated Time of Sample Receipt (VTSR). The date and time on which a sample or group of samples are received at the ECL, as recorded on the Field COC documentation.

4. PROCEDURES

4.1 Receiving Samples

NOTE: *These steps are carried out by a Sample Custodian upon receipt of samples. Project work leaders notify the Sample Custodian when sample delivery is expected. Only Sample Custodians may accept custody of samples delivered to the laboratory.*

4.1.1 Initiate a Sample Receiving & Custody Review Checklist Form (see Exhibit 6) for the group of samples being received.

NOTE: *Step 4.1.1 may be performed at any time during the sample receiving and log-in process, but must be completed prior to performing Step 4.3.*

4.1.2 Before opening the shipping container, inspect the custody seal(s) placed over the shipping container closure.

4.1.2.1 Verify that the custody seal(s) meets the following conditions:

- A. The seal is intact,
- B. The seal is dated and signed/initialed or otherwise traceable to the person applying the seal,
- C. The seal is placed such that the container cannot be opened without damage to the seal,
- D. The seal cannot be removed without damage to the seal.

4.1.2.2 IF the seal(s) is missing, or does not meet the conditions above (e.g., damaged, not completed [not signed/initialed and dated or traceable], placed such that the container could be opened without damage to the seal, or can be removed without damage to the seal), THEN document this information on the Sample Receiving & Custody Review Checklist Form.

4.1.3 Break the custody seal and verify that a COC form is present in the shipping container.

NOTE: *All CCP samples received at the ECL must be accompanied by a completed COC form (example in Exhibit 1). This COC form is sealed inside the shipping container.*

- 4.1.3.1 IF the samples are not accompanied by a COC form, THEN document this on the Sample Receiving & Custody Review Checklist AND contact laboratory supervision and laboratory QA representatives for instruction.
- 4.1.3.2 IF the samples are accompanied by a COC form, THEN remove the COC form from the shipping container, sign the COC form as the receiver, and record the date/time of the transfer (date/time that container custody seal was broken).
- 4.1.3.3 Document any problems identified with the container custody seal (step 4.1.2) on the COC form.
- 4.1.3.4 IF a temperature probe or temperature recording device is present in the shipping container, THEN record on Sample Receiving and Custody Receiving Checklist Attachment (see Exhibit 7) or print the temperature information.
- 4.1.3.5 Inspect the custody transfers documented on the COC form for completeness, consistency and continuity.
 - 4.1.3.5.1 Verify that a final relinquishing signature is present on the COC form.
 - 4.1.3.5.2 Verify that transfers of custody are documented in chronological order.
 - 4.1.3.5.3 IF discrepancies in the documented custody transfers are identified, THEN document the discrepancies on the COC form and the Sample Receiving & Custody Review Checklist Form.
- 4.1.4 Remove the canisters from the shipping container.
- 4.1.5 Inspect the COC form and the canisters.
 - 4.1.5.1 Verify that all canisters present in the shipping container are identified on the COC form.

- 4.1.5.2 Verify that all canisters identified on the COC form are present in the shipping container.
- 4.1.5.3 Verify that each canister has an accompanying sample tag.
- 4.1.5.4 Verify that each canister has a custody seal on the valve cap meeting the following criteria:
 - A. The seal is intact,
 - B. The seal is dated and signed/initialed or otherwise traceable to the person applying the seal,
 - C. The seal is placed such that the valve cap cannot be opened without damage to the seal,
 - D. The seal cannot be removed without damage to the seal.

NOTE: *Custody seals are usually applied to canisters by placing a signed/initialed and dated or traceable seal over or through a hinged plastic valve cap that is seated over the canister valve.*

- 4.1.5.5 Inspect each canister for physical signs of damage (i.e., dents, broken valves, etc.).
- 4.1.5.6 Verify that all canister valves are in the closed position.
- 4.1.5.7 Verify that the following minimum information is recorded on the COC form:
 - Signature of individual initiating custody along with time and date
 - Field sample IDs
 - Signatures of persons relinquishing and accepting custody with date and time of transfers.
- 4.1.5.8 Document any problems found in the preceding steps on the Sample Receiving & Custody Review Checklist Form and on the COC form.

- 4.1.6 Inspect the sample tags accompanying the canisters.
- 4.1.6.1 Verify that all field sample numbers on the SUMMA[®] canister tags correspond to those listed on the COC.
- 4.1.6.2 Verify that the following minimum information is recorded on the sample tags (example in Exhibit 2).
- Correct analytical requests
 - Sample description
 - Field sample ID
 - Sampler initials and organization
 - Ambient pressure and temperature
 - Date and time of sample collection
 - QC designation
- 4.1.6.3 Verify that information on the sample tags matches that on the COC.
- 4.1.6.4 Verify that the canister ID (EIXXX) on the sample tag or COC matches the canister ID found on the metallic silver label or bar code attached to the canister.
- 4.1.6.5 Document any problems found in the preceding steps on the Sample Receiving & Custody Review Checklist Form and on the COC form.
- 4.1.7 Allow canisters to equilibrate to room temperature.
- 4.1.8 Complete the following fields in the Analytical Laboratory portion of the sample tag: canister gauge pressure and units (psi if pressurized, inches Hg if below ambient, either units acceptable if at gauge zero), ambient temperature and pressure, date, and time.
- 4.1.9 Notify laboratory supervision, the sampling organization and the CCP Site Project Manager (SPM) of any discrepancies found in the documentation or any issues with sample integrity (e.g., broken custody seals) identified during the receiving process.

- 4.1.9.1 Resolve the discrepancies with sampling organization, if possible, and document the resolution on the Sample Receiving and Custody Review Checklist or attachments.
- 4.1.9.2 Initiate a nonconformance report (NCR) per CCP-QP-005, *CCP Nonconforming Item Reporting and Control*, if appropriate.
- 4.1.9.3 IF problems identified during receipt necessitate the return of the samples to the sampling organization, THEN perform the following steps.
 - 4.1.9.3.1 Replace the samples in the shipping container.
 - 4.1.9.3.2 Sign the COC form as the relinquisher.
 - 4.1.9.3.3 Place the COC form and sample tags inside the shipping container.
 - 4.1.9.3.4 Close the container and apply custody seals across the container closure such that they meet the criteria for step 4.1.2.1.
 - 4.1.9.3.5 Contact the sampling organization to arrange transport of the samples back to the sampling location.

4.2 Sample Log-In

NOTE: *All samples received at the ECL are logged in by a Sample Custodian prior to analysis. During the log-in process, laboratory receiving groups and laboratory sample numbers are assigned and generated to track the samples through the laboratory.*

- 4.2.1 Assign a Receiving Group Number to the samples.
 - 4.2.1.1 Record the receipt of the samples in the ECL Sample Receiving Logbook (see Exhibit 3).
 - 4.2.1.2 Determine the next available Receiving Group Number from the last entry in the ECL Sample Receiving Logbook.

NOTE: *The Receiving Group Number is an 8-character alphanumeric code in the format ECLYYXXX, where YY is the last 2 digits of the calendar year and XXX is a sequential number that starts with 001 at the beginning of each calendar year.*

4.2.2 Assign laboratory sample numbers to each sample.

4.2.2.1 Identify samples to be composited for analysis.

NOTE: Samples marked with “No” in the Composite column of the Field COC form cannot be composited for analysis. Samples marked with “Yes” in the Composite column of the Field COC form MAY be composited for analysis; the “Yes” indicates that compositing is allowable but not required. Samples should be composited to the greatest extent possible to increase analytical throughput.

4.2.2.1.1 Never composite the field blank, and the drum sample and the field duplicate.

NOTE: *The “Composite Y/N” field on the COC should always be checked “No” for these samples.*

4.2.2.1.2 Ensure that all samples assigned to a composite are from the same waste stream (lot number).

NOTE: *Samples from different waste streams CANNOT be composited.*

4.2.2.1.3 Do not assign less than four samples to a composite.

NOTE: *The total number of samples allowed in a composite may vary by waste stream or per client TRU Waste Generator/Storage Site instructions.*

4.2.2.2 Use the numbering format described in the Section 3.0 definition.

4.2.3 Enter the sample receiving data into the ECL sample tracking database to generate the Analytical Request Form (see example in Exhibit 5), laboratory sample labels and traveler labels.

4.2.4 Place each laboratory sample ID label on a paper tag (approximately 3¼" × 1½") and attach it to the fastener on the appropriate sample canister.

4.2.4.1 Verify that the label is being placed on the appropriate canister by comparing the canister ID (silver metallic tape label or bar code) to the canister ID portion of the field sample ID shown on the label.

- 4.2.5 Sign and date the Sample Receiving and Custody Review Checklist after verifying that all fields are complete.
- 4.2.6 Store the samples for analysis.
 - 4.2.6.1 Place all sample canisters in a tray(s) and label each tray with the Receiving Group number.
 - 4.2.6.2 Place a copy of the Analytical Request Form in the tray with the samples.
 - 4.2.6.3 Place the tray containing the samples in a storage cabinet.
 - 4.2.6.4 Initiate an Internal Sample Tracking Form (see example in Exhibit 4) for each Receiving Group..
 - 4.2.6.5 Verify that the storage temperature shown on the Temperature Recorder is between 0-40 °C.

NOTE: The temperature-recording device must have a current calibration sticker from the INL Standards and Calibration Laboratory.

- 4.2.6.5.1 IF the storage temperature exceeds these limits (0-40 °C),
THEN contact laboratory supervision and initiate NCR per CCP-QP-005.

4.3 Traveler Distribution

Notify ECL personnel of sample receipt by distributing Analytical Request Forms in Travelers.

- 4.3.1 Assemble Traveler Folders according to the distribution instructions provided in Table 1.
- 4.3.2 Verify that distribution and filing of all documents generated during sample receipt and log-in are completed according to Table 2.
- 4.3.3 Distribute the Travelers as shown in Table 1.

4.4 Analyst Sample Handling

- 4.4.1 Sign samples out of the sample storage area using the Internal Sample Tracking Form when ready to begin sample analysis.
- 4.4.2 Return samples to the storage area after completing analysis and complete the Internal Sample Tracking Form.

5. RECORDS

Records generated during the performance of this procedure are maintained as QA records in accordance with CCP-QP-008, *CCP Records Management*. The records are the following:

The following records generated during the performance of this procedure will be compiled into the Data Report in accordance with CCP-TP-188, *CCP Data Recording, Review and Reporting*.

QA/Lifetime

- Chain of Custody Forms (Copy)
- Gas Sample Canister Tags (Copy)
- Sample Receiving Custody Review Checklist
- Sample Receiving Custody Checklist Attachment or Printout of Temperature Information, if applicable
- NCR (Copy)

QA/Nonpermanent

- Analytical Request Form
- Copy of applicable pages of Sample Receiving Log Book

6. REFERENCES

- 6.1 CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- 6.2 CCP-QP-002, *CCP Training and Qualification Plan*
- 6.3 CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
- 6.4 CCP-QP-008, *CCP Records Management*

Exhibit 2. Gas Sample Canister Tag (Example)

TWCP GAS SAMPLE CANISTER TAG

								E	I	3	3	1
Z	Z	M	M	D	D	Y	Y	A	A	X	X	X
Sampling Site						Date		Canister ID				

Batch Number: _____ Drum Number: _____

Sampling Organization: _____ Sample Description: _____

Location	Canister Pressure C or M (1)	Ambient P and T (2)	Date MMDDYY	Time 24 Hour	Initials
Certifying Laboratory Cleaning Batch _____	C=	T= 21	061499	0830	REE
	M= < 5.0E-2	P= 640			
Field- Before Sample Collection	C=	T=			
	M=	P=			
Field- After Sample Collection	C=	T=			
	M=	P=			
Analytical Laboratory	C=	T=			
	M=	P=			

Blank Sample? Y / N (Circle one)

Analysis Requested	VOC's	Hydrogen	Methane

Remarks: _____

Sampler Signature: _____

- Notes:
- (1) C = Canister pressure gauge reading inches Hg (evacuated), or PSIG (pressurized); M = Manifold pressure gauge in mm Hg.
 - (2) P = pressure in mm Hg; T = Temperature in C.

Exhibit 5. Analytical Request Form (Example)

INEEL ENVIRONMENTAL CHEMISTRY LABORATORY
ANALYTICAL REQUEST FORM

PAGE: 1	RECEIVING GROUP NO. ECL02203	ANALYSES REQUIRED:
FIELD SITE: RWMC		GC-VOC: <input checked="" type="checkbox"/> GC-H2: <input checked="" type="checkbox"/>
SAMPLE TYPE: PREFILTER		GC/MS: <input checked="" type="checkbox"/> GC-CH4: <input checked="" type="checkbox"/>
NUMBER OF SAMPLES: 22	VTSR: 1545 04/09/02	

	LAB ID.	FIELD ID.	FIELD BATCH #	FIELD COC #	CANISTER SIZE (mL)	BLANK?
1	02099008	ID040702EIC77	PRF020168	100230	250	Y
2	02099009	ID040702EI648	PRF020168	100230	250	N
3	02099010	ID040702EI229	PRF020168	100230	250	N
4	02099011C15	ID040702EI562	PRF020168	100230	250	N
5	02099011C25	ID040702EI399	PRF020168	100230	250	N
6	02099011C35	ID040702EIB52	PRF020168	100230	250	N
7	02099011C45	ID040702EID01	PRF020168	100230	250	N
8	02099011C55	ID040702EIC63	PRF020168	100230	250	N
9	02099012C15	ID040702EI870	PRF020168	100230	250	N
10	02099012C25	ID040702EI584	PRF020168	100230	250	N
11	02099012C35	ID040702EI135	PRF020168	100230	250	N
12	02099012C45	ID040702EIB16	PRF020168	100230	250	N
13	02099012C55	ID040702EIE05	PRF020168	100230	250	N
14	02099013C15	ID040702EIB89	PRF020168	100230	250	N
15	02099013C25	ID040702EID69	PRF020168	100230	250	N
16	02099013C35	ID040702EI566	PRF020168	100230	250	N
17	02099013C45	ID040702EIC16	PRF020168	100230	250	N
18	02099013C55	ID040702EID81	PRF020168	100230	250	N
19	02099014C14	ID040702EI782	PRF020168	100230	250	N
20	02099014C24	ID040702EID51	PRF020168	100230	250	N
21	02099014C34	ID040702EID16	PRF020168	100230	250	N
22	02099014C44	ID040702EIE08	PRF020168	100230	250	N

Form Date 4/9/02
rptReqFrm.dsr

Exhibit 6. Sample Receiving & Custody Review Checklist (Example)

Environmental Chemistry Laboratory
TWCP Sample Receiving & Custody Review Checklist

Receiving Group: ECL	Nonconformance Report Initiation Required? Yes or No
Reviewer Signature:	NCR Number:
	Date:

Instructions: Complete one checklist per Report Group. Enter appropriate response for each question. Each "NO" response requires explanation. A "No" response requires explanation. A "NO" response to a question may require initiation of an NCR (consult with ALD QAO).

REQUIREMENT	YES	NO	COMMENTS
1. FIELD CHAIN OF CUSTODY (COC)			
a. Are all field samples listed on the accompanying COC form included in the shipment?			
b. Are all samples included in the shipment listed on the COC form?			
c. Are all custody transfers completely documented by signatures of relinquishers and acceptors, time, and date of transfer?			
d. Does all sample information (e.g., sample ID, sampling date and time, sample location, field batch, analytical request) listed on the COC correspond with the information on the sample tags?			
e. Are any corrections on the COC appropriately made [a single line through the incorrect data, correct data written in (not overwritten), initialed and dated]?			
2. SAMPLE TAGS			
a. Is each sample accompanied by a corresponding sample tag?			
b. Do the field IDs on the sample tags correspond with those on the COC?			
c. Does the sampling date within the field ID correspond with the date of the before/after collection field data?			
d. Is the field batch number recorded on each sample tag, and does it correspond with that recorded on the COC?			
e. Are the Sampling Organization and Sample Description fields completed?			
f. Are the Before Sample Collection data recorded on each tag (Canister pressure, ambient pressure and temperature, date and time, sampler initials)?			
g. Are the After Sample Collection data recorded on each tag (Canister pressure, ambient pressure and temperature, date and time, sampler initials)?			
h. Are VOCs and H ₂ analyses requested for each prefilter sample? (methane may also be requested)			
i. Is VOC analysis requested for each field blank sample (methane and H ₂ are optional)?			
j. Did the sampler sign each sample tag?			
k. Are any corrections on the sample tag appropriately made [a single line through the incorrect data, correct data written in (not overwritten), initialed and dated]?			
l. Do the last 5 characters of the sample ID match the SUMMA® canister ID?			
m. Is the ECL sample ID number written on each sample tag?			
3. ANALYSIS REQUEST FORM (ANRF)			
a. Do all field sample numbers correspond to those on the field COC?			
b. Do the corresponding Lab IDs for each sample match those written on the sample tags?			
c. Do the listed sample sizes correspond with the SUMMA® canisters?			
d. Do VTSR and the Field Batch number match those on the COC?			
e. Does the COC number(s) match the COC form number?			
f. Are the correct analysis requests checked?			
g. Are field samples forming a composite sample all from the same waste stream/lot number?			
4. SAMPLE INTEGRITY			
a. Is a signed and dated custody seal present on the shipping container?			
b. Is the shipping container custody seal intact and undamaged upon receipt at the laboratory?			
c. Is the shipping container custody seal placed such that the container cannot be opened without breaking the seal?			
d. Is a custody seal present on the valve of each sample canister?			
e. Is the custody seal on each SUMMA® canister intact and undamaged upon receipt at the laboratory?			
f. Is each custody seal placed such that the valve cannot be opened without breaking the seal?			
g. Has physical integrity of all samples been preserved (such as, no dents, no missing connectors)?			
h. Are the canister gauge pressure and ambient temperature and pressure recorded on the sample tag by ECL after canister receipt and equilibration to room temperature?			
i. Did all of the SUMMA® canisters maintain pressure during shipment (check pressure gauge against After Sample Collection Canister Pressure on sample tag)?			
j. Does each sample have an ECL Sample ID tag corresponding to the ANRF?			

The field sampling organization must be contacted if any discrepancies are found in the sample COC and tag documentation. This contact must be documented in writing.

Exhibit 7. Sample Receiving & Custody Review Checklist Attachment (Example)

**SAMPLE RECEIVING & CUSTODY REVIEW
CHECKLIST ATTACHMENT**

FIELD BATCH: _____

LABORATORY RECEIVING GROUP: _____

Temperature Probe Identification Number: _____

Expiration Date: _____

The temperature probe associated with the samples registered _____ upon receipt at the laboratory. The minimum temperature registered by the probe during transport was _____ and the maximum was _____.

Temperature Probe Identification Number: _____

Expiration Date: _____

The temperature probe associated with the samples registered _____ upon receipt at the laboratory. The minimum temperature registered by the probe during transport was _____ and the maximum was _____.

Signature of Sample Custodian: _____ Date: _____

Table 1. Traveler Assembly and Distribution

Traveler	Distribution	Contents
GCMS	GCMS Analysts	<ul style="list-style-type: none">Analytical Request Form
GC – FID	GC FID Analysts	<ul style="list-style-type: none">Analytical Request Form
GC – TCD	GC TCD Analysts	<ul style="list-style-type: none">Analytical Request Form
Data Report/Receiving	Data Reporting Personnel	<ul style="list-style-type: none">Analytical Request FormCOC form (original)Sample TagsTWCP Sample Receiving and Custody Review Checklist

Table 2. Sample Receiving and Custody Documentation

Activity	Document	Generated by	Distribution
Sample Receipt	1. Field Chain-of-Custody	Received w/Samples	<ul style="list-style-type: none"> Original – Data Report /Receiving Traveler
	2. Sample Tags	Received w/Samples	<ul style="list-style-type: none"> Original – Data Report/Receiving Traveler
Sample Log-In	1. Sample Receiving Logbook	Sample Custodian	<ul style="list-style-type: none"> Original – Sample Receiving
	2. Analytical Request Form	Sample Custodian	<ul style="list-style-type: none"> Original – Data Report/Receiving Traveler GCMS Traveler GC-FID Traveler GC-TCD Traveler Copy with the samples
	3. Laboratory ID Tags	Sample Custodian	<ul style="list-style-type: none"> Original - on sample canisters; discard after canister release
	4. TWCP Sample Receiving and Custody Review Checklist	Sample Custodian	<ul style="list-style-type: none"> Original – Data Report Traveler
Sample Storage	1. Internal Tracking Form	Sample Custodian	<ul style="list-style-type: none"> Original – Maintain in sample receiving until canister release, then include in Data Report.
	2. Temperature Monitoring Record	Sample Custodian/Temperature logger	<ul style="list-style-type: none"> Store in ECL Project Files when completed.
Analyst Notification	1. GCMS Traveler	Sample Custodian	<ul style="list-style-type: none"> GCMS Analysts
	2. GC FID Traveler		<ul style="list-style-type: none"> GC-FID Analysts
	3. GC TCD Traveler		<ul style="list-style-type: none"> GC-TCD Analysts
	4. Data Report/Receiving Traveler		<ul style="list-style-type: none"> Data Reporting Personnel