

STANDARD OPERATING PROCEDURE
FOR CHAIN OF CUSTODY OF SAMPLES

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Attachments:

A.	Chain of custody form	X
B.	Field data card and sample tag	X

1.0 Scope & Application:

- 1.1 This Standard Operating Procedure is applicable to the sample control procedures used for chain of custody of representative samples collected from various locations. It includes samples collected from both ambient and source locations.
- 1.2 A sample is physical evidence collected from a facility or from the environment. An essential part of all enforcement investigations is that evidence gathered be controlled. To accomplish this, the following sample identification and chain of custody procedures are established.

2.0 Summary of Method:

- 2.1 The method of sample identification depends on the type of measurement or analyses performed. When in-situ measurements are made, the data are recorded directly in logbooks or Field Data Cards with identifying information, field observations, and remarks. Examples of in-situ measurements are pH, temperature, D.O., conductivity, and flow measurement. Samples other than in-situ measurements, are identified by a sample tag or label. These samples are removed from the sample location and transported to a laboratory for analyses. Before removal, however, a sample is often separated into portions depending upon the analyses to be performed. Each portion is preserved in accordance with applicable procedures and each sample container is identified by a sample tag / label.
- 2.2 Sample tags / labels shall be completed for each sample, using waterproof ink, unless prohibited by weather conditions. For example, a logbook notation would explain that a pencil was used to fill out the sample tag because a ball point pen would not function in freezing weather. The information recorded on the sample tag/label includes:
- Station Number - a number assigned by the project coordinator
 - Date - a six digit number indicating the year, month, day of collection
 - Time - a four digit number indicating military time of collection. e.g. 0954
 - Station Location - sampling station description
 - Samplers - each sampler is identified
 - Sample Number - a unique sample # established from the Field Data Card for each set of samples collected at one time and place
 - Parameter/pres. - the analysis to be conducted for the sample /sample preservation
 - Remarks - the samplers record pertinent observations affecting analyses, if any
- 2.3 A Field Data Card which assigns a unique number to each set of samples, must be completed for each sampling event. The field data card used for samples contains an appropriate place for designating the sample as a grab or a composite, and identifying the type of sample collected for analyses.

- 2.4 Due to the evidentiary nature of samples collected during enforcement investigations, possession must be traceable from the time the samples are collected until they are introduced as evidence in legal proceedings. To maintain and document sample possession, chain of custody procedures are followed. A sample is under custody if:
- It is in your possession, or
 - It is in your view, after being in your possession, or
 - It was in your possession and then you then locked it up to prevent tampering, or
 - It is in a designated secure area.
- 2.5 In collecting samples for evidence, collect only that number which provides a good representation of the media being sampled. To the extent possible, the quantity and types of samples and sample locations are determined prior to actual field work. As few people as possible should handle samples. The field sampler is personally responsible for the care and custody of the samples collected until they are transferred or dispatched properly.
- 2.6 Samples are accompanied by a chain of custody record. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents sample custody transfer from the sampler, often through another person, to the analyst at the laboratory. The samples are typically transferred to the sample receiving custodian at the laboratory.

3.0 Definitions:

- 3.1 **Bottle Blank: Analyte-free water is collected into a sample container, of the same lot as the containers used for the environmental samples. This evaluates contamination introduced from the sample container(s) from a common lot.**
- 3.2 **Equipment/Rinse/Rinsate Blanks:** A sample that is collected by pouring over or running analyte-free water through the sample collection equipment after decontamination and before sample collection. The sample is collected in the appropriate sample container with the proper preservative, identical to the samples. This represents background contamination resulting from the field equipment, sampling procedure, sample container, preservative, and shipment.
- 3.3 **Field Blank:** In the field, analyte-free water is collected into a sample container with preservatives. The sample containers are the same lot used for the environmental samples. This evaluates contamination introduced from the sample container(s) with applicable preservatives. Field blanks are not used for volatile samples.
- 3.4 **Field Replicates/Duplicates:** Two or more samples collected at the same sampling

location. Field replicates should be samples collected side by side or by collecting one sample and immediately collecting the second sample. Field replicates represent the precision of the whole method, site heterogeneity, field sampling and the laboratory analysis.

- 3.5 **Field Split Samples:** Two or more representative subsamples taken from one environmental sample in the field. Prior to splitting, the environmental sample is homogenized to correct for sample heterogeneity that would adversely impact data comparability. Field split samples are usually analyzed by different laboratories (interlaboratory comparison) or by the same laboratory (intralaboratory comparison). Field splits are used to assess sample handling procedures from field to laboratory and laboratory's comparability.
- 3.6 **Filter Blank:** In the field, analyze-free water is passed through a filter and collected into in the appropriate sample container. The filter blank is then preserved. This procedure is identical to the sample collection.
- 3.7 **Laboratory Quality Samples:** Additional samples will be collected for the laboratory's quality control: matrix spike, matrix spike duplicate, laboratory duplicates, etc.
- 3.8 **Proficiency Testing (PT)/Performance Evaluation Sample (PES):** **A sample, the composition of which is unknown to the laboratory or analyst, provided to the analyst or laboratory to assess the capability to produce results within acceptable criteria.** This is optional depending on the data quality objectives.
- 3.9 **Shipping Container Temperature Blank:** A water sample that is transported to the laboratory to measure the temperature of the samples in the cooler.
- 4.0 **Trip Blanks:** A sample collected at the laboratory using analyte free water in the appropriate sample container with the proper preservative, taken out to the field, and returned to the laboratory for analysis without being opened. Trip blanks are generally for volatile organic compounds, low level metals, and gasoline range hydrocarbon samples. Used to assess contamination introduced during sample transport.
- 4.0 Health and Safety Warnings:**
- 4.1 When working with potentially hazardous materials or situations, follow EPA, OSHA, and specific health or safety procedures.
- 4.2 All proper personal protection clothing and equipment is to be worn.
- 4.3 When sampling lagoons or surface impoundments containing known or suspected

hazardous substances, take adequate precautions. The sampling team member collecting the sample should not get too close of the edge of the impoundment, where bank failure may cause them to lose their balance.

4.4 Follow the Boat Safety SOP when conducting sampling from a boat.

4.5 Some samples may contain biological and chemical hazards. These samples should be handled with suitable protection to skin, eyes, etc.

5.0 Interferences:

5.1 Interference may result from using contaminated equipment, **solvents, reagents, sample container**, or sampling in a disturbed area.

5.2 Cross contamination problems can be eliminated or minimized through the use of dedicated sampling equipment. If this is not possible or practical, then decontamination of the sampling equipment is necessary.

5.3 **All sampling equipment must be routinely demonstrated to be free from contaminants under the conditions of the analysis by running equipment blanks.**

6.0 Personnel Qualifications:

6.1 All field samplers working at Superfund sites are required to take a 40 hour health and safety training course and a refresher course prior to engaging in any field activities.

6.2 The field sampler should be trained by an experienced sampler before initiating the procedure.

6.3 All personnel shall be responsible for complying with all quality assurance/quality control requirements that pertain to their organizational/technical function.

7.0 Equipment and Supplies:

7.1 log book, field data cards, custody seals, and chain of custody form

7.2 Zip lock plastic bags, large plastic bags, tape

7.3 Cooler(s) or other container(s) for securing samples

7.4 Padlock(s) (optional)

8.0 Sample Collection:

- 8.1 Sample control procedures, chain of custody procedures, are used in the collection of any type of samples. The level of control is strict for enforcement (evidence) samples and may be less for screening samples or water quality type samples.
- 8.2 The above (section 2.1 to 2.6) section address chain of custody procedures for enforcement type samples. Enforcement samples will also have custody seals placed on each individual sample container. Any automatic composite sampler will be secured with custody seals or padlocks to control access to the sample during collection.
- 8.3 All samples must have a unique field sample number that will identify it with a specific collection location/date/time and cannot be reused for the project. The field sample numbers may be generated during planning/preparation for the sampling or during sampling and can consist of up to 12 characters.
- 8.4 The sample containers may be pre-labeled (sample tagged) before sample collection or labeled (sample tagged) immediately after collection. The sample identification can consist of sample tags, labels, or indelible writing directly on the sample container. The required identifying sample information for any sample are:
-unique field sample number
-parameter(s) to be analyzed and sample preservation
-date & time of sample collection
-station number / location
-samplers
- 8.5 A chain of custody form will be used to transfer custody of samples to the laboratory. The form used may be as identified in the attachment or other chain of custody forms provided the same information is provided. Any alternative form used must at a minimum have a unique field sample number identifying each sample to be analyzed, parameter for analyses, sample collection date & time, sampler, custody transfer signature area.

9.0 Sample Handling, Preservation, and Storage:

- 9.1 Transfer the sample or collect directly a suitable labeled sample container.
- 9.2 Preserve the sample or use pre-preserved sample bottles, when appropriate.
- 9.3 Cap the container, use a custody seal if the sample is for enforcement and then place the container in a zip-lock plastic bag.

- 9.4 Place sample containers into cooler(s) ensuring that the bottles are in the ice but not totally immersed in water. Samples not requiring refrigeration do not need to be placed on ice.
- 9.5 Record all pertinent data in the logbook and on the field data card or sheet.
- 9.6 Complete the chain of custody form.
- 9.7 Samples may require short term storage in field locations prior to delivery to the laboratory for analyses. The storage may be in vehicles or lodging locations. The samples must be secured to limit access to them. A locked vehicle is considered controlled access. However, simply a locked lodging room is not secure due to potential custodial access. If an unattended lodging room is used for sample storage, the samples must be further secured. This may entail a padlock on the ice chest, samples in an ice chest secured in an inner bag with a custody seal on it, Ice chest taped shut with custody seal on the outside of it.
- 9.7 Attach the custody seals to the cooler prior to shipment if for investigation or shipment to another laboratory. If the samples are shipped, put the chain of custody form in a Zip-lock bag and tape to the inside cover of the cooler. Samples must be packaged to prevent breakage and leakage of any melted ice from the shipping container. The chain of custody form should have the courier name listed as receiving the samples for transport, however there will be no signature from the courier.
- 9.8 A list for the laboratory's containers and preservatives for the various analytes is located on the EPA Region 1 homepage under OEME.
- 9.10 Whenever samples are split with a source or other government agency, a separate chain of custody form should be completed for the samples and the relinquisher (sampler) and recipient should sign. If a representative is unavailable or refuses to sign for the samples, this can be noted in the "remarks" area of the form. When appropriate, as in the case where the representative is unavailable, the custody record should contain a statement that the samples were delivered to the designated location at the designated time. A copy of the chain of custody form for split samples must be kept with the project file.

10.0 Data and Records Management:

- 10.1 All data and information is to follow the Field Data Management SOP.
- 10.2 The chain of custody form is signed over to the laboratory. A copy is kept with the

sampling records.

- 10.3 The sampling data is stored at US EPA - NE, 11 Technology Dr, North Chelmsford, MA for at least 3 years.

11.0 Quality Control and Quality Assurance:

- 11.1 Representative samples are required. The sampler will evaluate the site specific conditions to assure the sample will be representative.
- 11.2 All sampling equipment must be decontaminated prior to use and after each discrete sample following the General Field Equipment - Cleaning, Preparation, and Decontamination SOP.
- 11.23 All field QC samples requirements in the SAP or QAPP must be followed. These may involve trip blanks, equipment blanks, field duplicates and the collection of extra samples for the laboratory's quality control.

12.0 Waste Management and Pollution Prevention:

- 12.1 During field sampling and analysis events there may be hazardous waste produced from the sample collection. The waste must be handled and disposed of in accordance with federal, state, and municipal regulations. Dispose of the hazardous waste produced at the site where the work was performed, if the operating site has proper disposal available. If there is no disposal that meets regulatory requirements, the waste must be transported back to EPA-NE and transferred to the hazardous waste manager for disposal. The sample volume should be minimized to reduce unnecessary waste.
- 12.2 This SOP for sample chain of custody will not generate any waste