

Environmental Contaminants Laboratory

Sample Submittal Guide





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INTRODUCTION

LABORATORY OVERVIEW

'The Inland Fisheries Division operates an analytical laboratory in San Marcos to provide for the chemical testing needs of the Department.'

Texas Parks and Wildlife Department (TPWD) operates the Environmental Contaminants Laboratory (ECL) to provide chemical testing for the department in support of this mission.

Traditionally, chemical analyses at the ECL were performed in support of TPWD research projects that required biological and chemical studies. Rapid analysis was provided for the immediate needs associated with pollution events such as chemical spills and wildlife kills.

These services are also available to other programs, divisions and agencies. The ECL can provide analytical support in a cost-effective, timely manner. Requests for analysis are considered based on applicability to the Department's mission and funding potential.

Another facet of chemical analysis performed at the ECL is the preservation of the chain-of-custody so that legally defensible data is maintained. This is accomplished by following standard methods that have been validated using a strict quality assurance program, maintaining standard operating procedures and participating in peer-reviewed inter-laboratory comparison exercises.

USE AND APPLICATION OF THIS MANUAL

'Inappropriate or inadequate collection procedures and sample documentation may render samples useless for analysis.'

This manual is a simple guide for submitting valid samples to the Laboratory by people with limited experience in collecting and submitting samples. Inappropriate or inadequate collection procedures and sample documentation may render samples useless for analysis. This guide offers suggestions which may help reduce mistakes made in submitting samples to the Laboratory.

Common sampling problems include the use of inappropriate sample containers for collecting a particular contaminant of concern; incorrect sample preservation or storage; poor documentation; incomplete instructions on which analytes to test; and chain of custody omissions.

This manual offers tips and information for collecting samples, suggestions for alternate sampling equipment, and procedures for submitting samples to the Laboratory for people unfamiliar with this standard operating procedure.

Frequently, samples are collected in response to a pollution or fish kill event. The investigator is responsible for reporting all spills, kills or other pollution events to the Kills and Spills Team (KAST) biologist responsible for that region. The TPWD 24-hour communications number is (512) 389-4848. That office will contact the appropriate staff or the investigator can contact the Regional Biologist directly using the information located on pages 12-13 of this booklet.

ANALYTICAL CAPABILITIES

'The Environmental Contaminants Laboratory specializes in analysis of marine and fresh water organism tissue samples. Testing can also be performed on soil, sediment and water samples.'

The Environmental Contaminants Laboratory specializes in analyzing tissue samples of marine and aquatic organisms. More common matrices such as soil, sediment and water are completed as well. Under some circumstances hazardous waste samples may be accepted; however, these are considered on a case-by-case basis.

The Laboratory staff direct the majority of their efforts and expertise in two broad analytical areas – the determination of metals and metalloids and the analysis of organic contaminants. Organic analytical expertise concentrates on organo-chlorine compounds such as pesticides and polychlorinated biphenyls, and poly-cyclic aromatic hydrocarbons (PAH's).

Many other analyses are available upon request. The investigator is advised to contact the Laboratory Manager for more information on analytical capabilities at (512) 353-3486 or david.klein@tpwd.state.tx.us

CHAIN-OF-CUSTODY

'Proper COC paperwork is mandatory for all samples that may be admitted as evidence in court.'

The ECL Chain-of-Custody (COC) seal and analysis request form are available from the ECL upon request. Proper COC paperwork is mandatory for all samples that may be admitted as evidence in court. Use of this or comparable COC documentation is strongly encouraged for all other samples submitted to the ECL.

COC is preserved by following a few simple guidelines:

- Collect the sample in an appropriate container (see pages 4-5)
- Preserve the sample correctly (generally, keep at 4°C or on ice)
- Timely delivery of the sample to ECL (< 48 hours after collection)
- Prevent tampering with the sample (secure sample lid and delivery container with a lock or custody seal)
- Maintain proper sample transfer to new custodian

Samples are considered in custody if they are:

1. within view or sight of the custodian or
2. secured in a manner which assures that the integrity of the sample has not changed.

Collectors should seal each individual sample container with evidence tape or other custody seal which would have to be broken if anyone tampered with the sample. Locking the sample in a room or vehicle is suggested as a precaution when no other controls are possible. Sample containers shipped by public transport (bus) are deemed secure, but sensitive evidence samples may require a shuttle.

A hard-cased ice chest is recommended for routine shipment of samples. When required, several sampling containers can be sealed and shipped in a clear kitchen-size plastic bag, but great care must be taken that normal handling does not tear the bag and compromise the COC. If a bag is used, close the bag using a knot and seal with COC seal. The cost of an ice chest is a very inexpensive precaution to protect samples and insure that they will be admissible in court.

When a sample is relinquished, record the date, time and sign the COC. Use a ballpoint pen or permanent marker. The new custodian will also sign the COC; noting the condition of the sample and its seal.

Samples received at the ECL will be checked. The condition of the custody seal will be recorded. Samples will be considered “in custody” if they are intact, have not leaked, are undamaged and preserved appropriately.

SAMPLE CONTAINERS

‘Training and use of proper sampling procedures and tools can be provided by the ECL chemists and the Kills and Spills Team biologists.’

Sample contamination is an ever-present concern, especially during collection. Upon request a limited supply of proper sampling containers and supplies can be provided by the ECL. A partial list of container suppliers can be found on page 10 for large quantity needs. Training and use of proper sampling procedures and tools can be provided by the ECL chemists and the Kills and Spills Team biologists. This “hands-on” training is encouraged, but successful sampling is easily achieved by following a few precautions.

WATER SAMPLES:

For Metal Tests:

Use clean plastic or glass containers. It is recognized that sampling often occurs unexpectedly and standard containers may not be available. If so, purchase two or more quart-size bottles of de-ionized or distilled drinking water, preferably having screw caps. Empty one of the containers, rinse it twice with the sample water, and fill it to the top with sample. Secure the top and use a tamper-proof seal. Identify the sample with a waterproof marker and place on ice as soon as possible. **Do not submerge the top of the container.** The other bottle of water remains unopened and is marked clearly with the word, “BLANK.” Store it identical to the samples. Only one BLANK is required per sampling event.

For Organic Tests:

Use only clean glass containers. A new quart Mason jar is an example of a suitable container. **The jars should be washed with dish soap and water then rinsed three times with commercially available purified drinking or distilled water** (the water can come from the metals sample containers described above). Fill the jar to the top, cover the mouth and threads of the jar with clean aluminum foil, place the metal lid over

the foil, screw on top ring and affix a waterproof label on the jar. The foil prevents contamination of the sample from rubber, paper and glue found on many jar lids.

NOTE: Create a BLANK. Fill one of the cleaned Mason jars with distilled water. Cap, mark and preserve it like the samples.

TISSUE AND SEDIMENT SAMPLES:

Animal and plant specimen should be wrapped in several layers of new aluminum foil and sealed in a waterproof plastic bag. Sample identification may be written directly on the collection bag using waterproof ink or a second waterproof bag can be used. A separate sample identification tag can be created and inserted along with the original bagged sample into the second bag for preservation and transport. Sediment samples are normally contained in pint Mason jars. The top should be sealed with aluminum foil as described in the Organic Analysis section. Alternately, sediment samples may be placed directly into waterproof plastic bags but only if metals are the only tests that will be run.

The collector must strive to collect the samples using tools constructed from materials dissimilar from the contaminant of concern. Metals samples are ideally collected using plastic spoons or shovels; if organic constituents are to be identified, then, metal spoons can be used. Wood should be avoided, since it cannot be adequately decontaminated. A stainless steel scoop is generally safe to use for all collecting chores.

Keep in mind that contamination of a sample is always a concern. When collecting multiple samples, wash (or at least thoroughly rinse) all equipment used in the preparation or collection of samples. For example, the knife and foil-topped cutting board used to fillet fish or the shovel/spoon used to dig up sediment samples needs to be washed and then rinsed with distilled water or changed out for a separate, clean scoop between samples. **To minimize contamination of organic samples avoid any contact with plastic, rubber, oil or grease.**

SAMPLE LABELS

'All sample bottles must be individually labeled with sufficient information to determine where and when they were collected. Remember, once they leave the collector's custody, this is the only record linking a sample with the site.'

TAGS REQUIRED

Every sampling container in a set of samples submitted to the ECL must have a unique sampling tag that identifies individual samples within the group. All of the information can be printed on each label or each collecting jar can be numbered and the pertinent information logged into the field notebook used to document the event. In any event, all sample bottles must be individually labeled with sufficient information to determine where and when they were collected. Remember, once they leave the collector's custody, this is the only record linking a sample with the site.

LABEL PRECAUTIONS

The safest way to identify a sample bottle is to place all the information permanently on the collection vessel. A waterproof pen must be used to write all data. This information can be placed directly on the jar, or written on a label that is permanently attached to the container. If the glue on the label is not waterproof, the sample may have to be placed in a plastic bag for transport on ice. Do not put any information on the lid. It could lead to confusion or analytical error when the lid is separated from the jar in the lab. Masking tape or preferably duct tape can be used as label material.

REQUIRED INFORMATION

At a minimum each label must contain the location (stream name and site on that waterbody), time and date that sample was collected as well as the collector's name. A unique sample number should be created for each sample. Please use simple numbers (1, 2, 3, etc.). Log this information on the sample tag as well as the field notebook.

SAMPLE QUANTITY

'Sample quantity can be less than suggested; however, detection for the contaminant of concern will be less sensitive.'

The chart below indicates the minimum and preferred quantities of sample for the different chemical tests that are available. Sample quantity can be less than suggested; however, detection for the contaminant of concern will be less sensitive. If you have further questions please call the ECL.

Sample Amount Required

	Metals	Organics
Soil, Sediment or Tissue	10 g (~ 0.3 oz)	10 g
SST – Preferred Size	25 g (~ 1 oz)	100 g
Water	1 L (~ a quart)	1 L
Water – Preferred Size	4 L (~ a gallon)	4 L

FIELD SAMPLING

'A minimum of three samples are suggested at an incident.'

In the case of a fish kill or chemical spill in a waterway such as a stream, a minimum of three samples are suggested: one at the problem site, a second sample of upstream "clean" water and a third downstream from the problem site. If an upstream site is not available, it is recommended that a sample from a nearby, similar stream be collected. In a lake or tank, a sample at the kill site should be taken, then one close to the kill site, and one at a distant site on the waterbody.

It is much easier to locate potential toxicants in water than in dead organisms; however, do not forego sampling specimens. When dealing with a kill event, it is important to document the extent of the impact to biotic resources. It is possible in some cases to later identify a toxic chemical in a dead organism that was initially isolated from the water. Demonstrating this causal relationship is integral to developing a sound case against a potential responsible party.

The sample collection described above is associated with short-term events such as spills and kills. Quick response is usually required. The Regional Pollution Biologist is available to complete this task and must be informed regardless of who collects the samples. (See map, page 11).

QUALITY ASSURANCE AT THE ECL

'Quality Control samples include duplicate samples, method blanks, spikes and analysis of a standard reference material (SRM) where possible.'

Quality Assurance (QA) is an integral part of the ECL analytical procedures and protocol. A written Quality Assurance Plan is on file at the ECL and is followed for sample analysis. Quality Control samples and procedures include analyzing duplicates of the same sample, insuring that method blanks, spikes and standard reference material (SRM) where possible are part of the suite of samples that are being analyzed.

Data can be provided to the investigator by hard copy, FAX or electronically.

TURN-AROUND TIME

'When inquiring about analysis it is important to communicate when the sample results are needed.'

Lab turn-around time depends on several factors. The most important of these considerations is the priority designated to the analysis request. When inquiring about analysis it is important to communicate when the sample results are needed. If the samples are considered to be an emergency, be sure to clearly state this. Rush sample requests should be justified for that consideration. This ensures that both the ECL and the parties requesting testing agree when the results are expected.

RUSH SAMPLES

'All rush samples need to be coordinated through the Lab Manager.'

A rush sample is defined as any analysis that must be obtained in less than 20 working days. All rush samples need to be coordinated through the Lab Manager.

DISPOSAL OF SAMPLES

'Any sample which is tested and found to contain hazardous wastes will be returned. The ECL will not assume responsibility for disposal of hazardous materials submitted for analysis from outside agencies.'

Any sample originating from a responsible party which is tested and found to contain hazardous material will be returned. The Environmental Contaminants Laboratory will not assume responsibility for disposal of hazardous materials submitted for analysis from outside agencies.

APPENDIX

SUGGESTED SAMPLE CONTAINERS FOR SOIL OR WATER SAMPLING

At this writing VWR is the Texas state contract vendor.

VOA water samples:

175-43-92020-5 CS

40 ML - I-CHEM - #15900-022 - 72/CS

Soil/sediment samples:

175-43-92030-4 CS

125 ML (SHORT) - I-CHEM - #15900-168 - 24/CS

Semi-Volatiles, Pesticides, PCBs, metals water samples:

1000mL amber glass VWR brand - #15900-142 - 12/CS

COST FOR SAMPLE ANALYSIS

Prices for analytical services are available upon request.

REGION 1

A.E. Wood Fish Hatchery
505 Staples
San Marcos, Texas 78666

Stephen Twidwell

Office: (512) 353-3474
Mobile: (512) 757-3340
FAX: (512) 353-7329
Pager: (800) 299-4099
PIN: 2669
Radio: 03801

REGION 2

1601 East Crest Drive
Waco, Texas 76705

Joan Glass

Office: (254) 867-7956
Mobile: (254) 744-9772
FAX: (254) 867-6839
Pager: (800) 299-4099
PIN: 2670
Radio: 03802

REGION 3

11942 FM 848
Tyler, Texas 75707

Greg Conley

Office: (903) 566-2518
Mobile: (903) 520-3821
FAX: (903) 566-2357
Pager: (800) 299-4099
PIN: 2668
Radio: 03803

Adam Whisenant

Office: (903) 566-8387
Mobile: (903) 520-8350
FAX: (903) 566-2357
Pager: (800) 299-4099
PIN: 7903
Radio: NA

REGION 4

1502 Pine Drive (F.M. 517)
Dickinson, Texas 77539

Winston Denton

Office: (281) 534-0138
Mobile: (713) 248-4883
FAX: (281) 534-0122
Pager: (800) 299-4099
PIN: 7859
Radio: 03804

REGION 5

TAMUCC
Natural Resources Center
6300 Ocean Drive, NRC Suite 2501
Corpus Christi, Texas 78412

Michael Weeks

Office: (361) 825-3246
Mobile: (361) 658-3181
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