

Safe Drinking Water Act (SDWA) Chemical & Radiological Compliance Sampling

Pocket Guide

(For EPA Region 6 Tribal Water Systems)



**Southwest
Environmental
Finance
Center**

July 2016
Accurate
Environmental
Laboratories

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Introduction

Compliance sampling as required by the Safe Drinking Water Act (SDWA) plays an important role in protecting public health.

This guide is to be used by EPA Region 6 Tribal Public Water Systems (PWS) who use Accurate Environmental Laboratories in Stillwater, Tulsa and Oklahoma City, OK for SDWA chemical and radiological compliance sample testing.

This Pocket Guide along with the compliance Sampling Schedule provided each year by EPA Region 6 should be used together to ensure that compliance samples are taken in a timely manner according to established schedules. Ensuring that this is done is the responsibility of each water system.

For questions regarding SDWA Compliance Sampling Schedules contact the EPA Region 6 Tribal Drinking Water Program Coordinator – Kim Ngo Kidd – at (214) 665-7158 or Ngo.Kim@epa.gov.

For questions regarding laboratories contact Matt Ziegler at (505) 681-7435 (mattz@unm.edu) or Rose Afandi at (505) 620-5191 (rafandi@unm.edu) at the Southwest Environmental Finance Center (SW EFC).

Information in this Pocket Guide is subject to change at any time. The latest version of this Pocket Guide is always available at the bottom of our Tribal Drinking Water Program Webpage.

Scheduling Compliance Sampling

Each PWS should have a designated Regulatory Compliance Officer (RCO). The RCO is the person at the water system who is responsible for understanding the compliance schedule for each water system, scheduling sample collection and ensuring that compliance samples are taken as required. The RCO can either be responsible for collecting the samples themselves or delegating the collection responsibility to someone else.

Compliance sampling needs to be scheduled according to the annual Sampling Schedule provided by EPA Region 6. Close attention needs to be given to any seasonal or quarterly collection schedules. For example, disinfection byproduct sampling for chlorinated systems monitoring annually or once every 3 years should only be scheduled between July and September. If sampling occurs outside of this seasonal window then the sample results cannot be used for compliance purposes.

Sampling should only occur when the water system is operating under normal conditions. If compliance samples are scheduled for collection and the system is not operating normally, then sampling should be postponed until normal operating conditions are restored.

Sampling should always be scheduled earlier in the monitoring period rather than later to ensure that there is plenty of time left in the period in case a problem arises and compliance sample collection has to be rescheduled.

Ordering Bottles

It is the responsibility of each water system to order and obtain sampling materials.

Prior to ordering bottles, determine what is required by using the EPA Region 6 Annual SDWA Sample Schedule for each water system. You can use Table 1 on the next page to help keep track of what you need to order.

Plan ahead and try to pick up sample bottles if you are already coming into Stillwater, Tulsa or OKC for something else. If the water system is on a quarterly schedule for any chemicals, it is always a good idea to have extra sample containers on hand.

Bottles can be ordered by phoning Accurate Labs in:

Stillwater (405) 372-5300

Tulsa (918) 663-5400

Oklahoma City (405) 751-3132

******When ordering bottles, be sure to tell the person at Accurate Labs that the bottles are for an EPA Region 6 Tribal Drinking Water System******

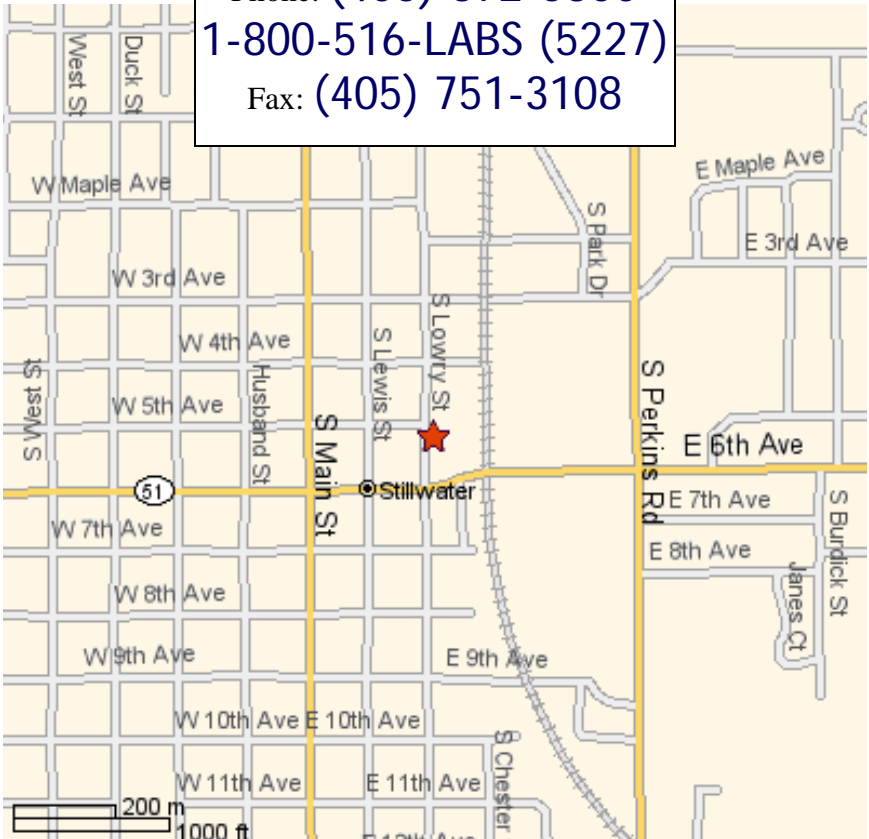
Table 1 – Sample Bottles to Order
From Accurate Labs

Chemical/s Sampling For:	Number Required:
Nitrate-Nitrite	
Drinking Water Metals (IOC)	
Fluoride (IOC)	
Cyanide (IOC)	
Total Arsenic	
Volatile Organic Chemicals (VOCs)	
Synthetic Organic Chemicals (SOCs)	
Radiologicals (gross alpha, gross beta, combined radium 226/228 and uranium)	
Total Uranium	
Disinfection Byproducts (TTHMs and HAA5s)	

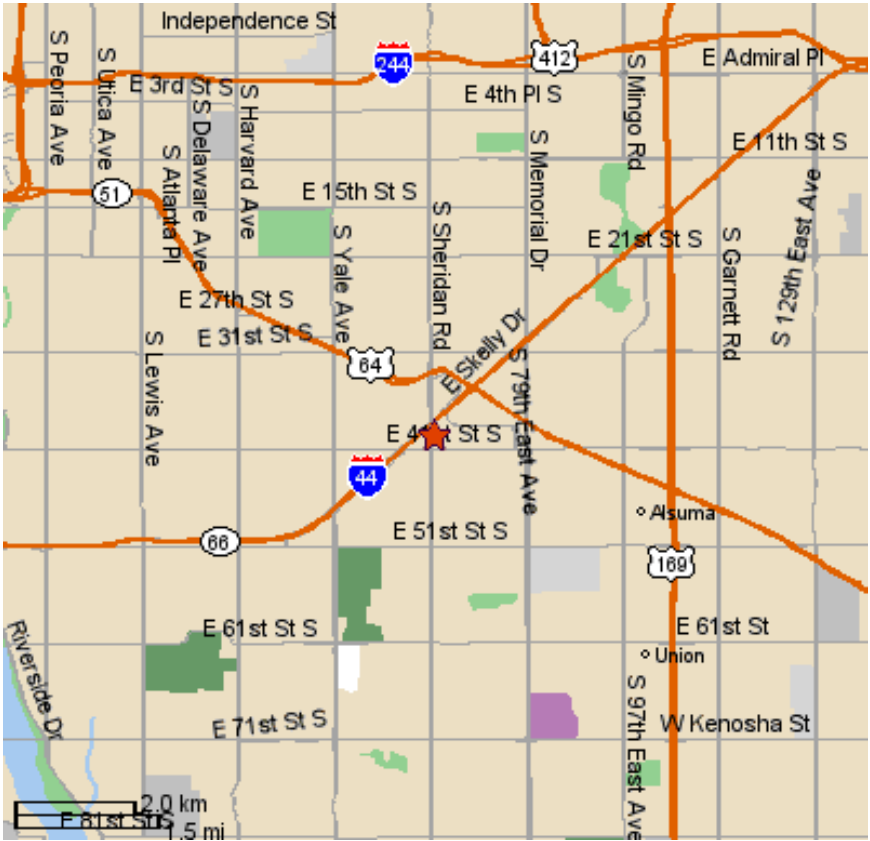
Picking up Bottles – Accurate Labs Locations

When picking up bottles and before leaving the lab, please go over your order to ensure that you have all of the bottles you ordered and any preservatives you might need.

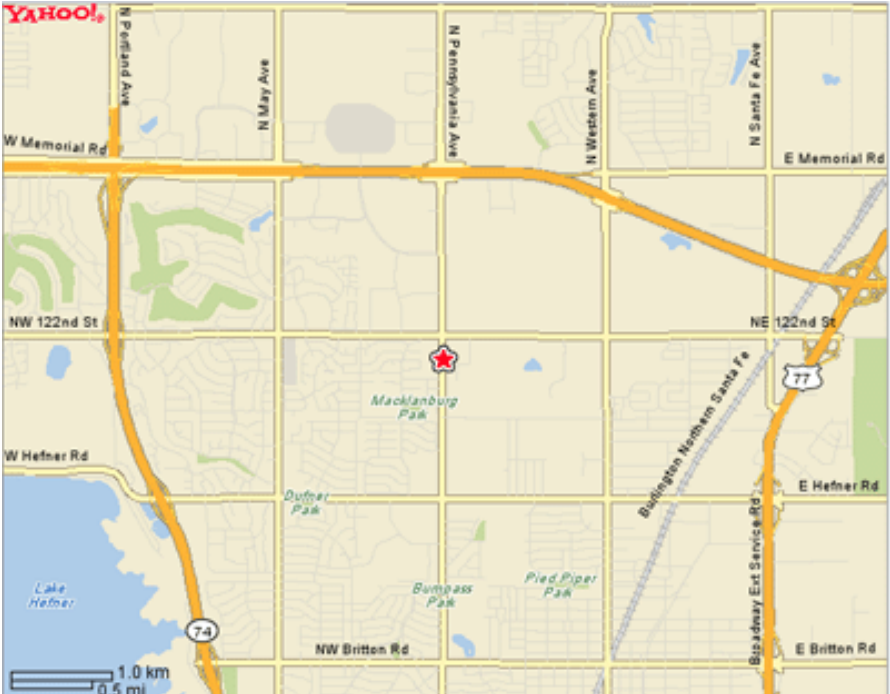
Accurate Labs - Stillwater
505 South Lowry
Stillwater, Ok 74074
Phone: (405) 372-5300
1-800-516-LABS (5227)
Fax: (405) 751-3108



Accurate Labs - **Tulsa**
6558 E 40th St.
Tulsa, OK 74145
Phone: (918) 663-5400
Fax: (918) 663-6300



Accurate Labs - OKC
12036 North Pennsylvania
Oklahoma City, Ok 73120
Phone: (405) 751-3132
Fax: (405) 751-3108



Preparing to Collect Samples

Prior to collecting compliance samples, the following materials need to be assembled:

- Annual SDWA Sample Schedule for each water system
- Sampling Plan if sampling for Stage 1 or 2 DBPs
- Bottles
- Pen & Marker
- Chain of Custody/s
- Chlorine Test Kit
- Cooler with bagged ice or blue ice

Once everything is assembled, use Table 2 and Table 3 to help identify what bottles are used for each of the chemicals being sampled. If needed, use a marker and write on each bottle what chemical or chemical group it is for.

Table 2 – Accurate Labs Chemical/Radiological Sample Bottles, Preservatives & Hold Times

Chemical	Bottle	Preservative	Hold Time
Nitrate	500 ml plastic	< 6° C	48 hours
Nitrite	500 ml plastic	< 6° C	48 hours
Nitrate-Nitrite	500 ml plastic	< 6° C & H ₂ SO ₄	28 days
IOCs – Fluoride	1 L plastic	< 6° C	28 days
IOCs – Total Cyanide	500 ml brown plastic	< 6° C, post NaOH	14 days
IOCs – Drinking Water Metals	500 ml plastic	< 6° C & HNO ₃	6 months (mercury 28-days)
Radiologicals (Gross Alpha/Beta, Combined Radium 226/228, Uranium)	4 L plastic cubitainer	None	6 months
VOCs	3-amber 40 ml VOA Vials NO HEADSPACE	< 6° C Ascorbic Acid, Maleic Acid	14 days
SOCs	Various – see Table 3	< 6° C & various – see Table 3	14 days
DBP – TTHM	2-amber 40 ml VOA NO HEADSPACE	< 6° C & Na ₂ S ₂ O ₃ , <6°C	14 days
DBP – HAA5	2-amber 60 ml VOA	< 6° C & Ammonium Chloride	14 days

Table 3 – Accurate Labs Full SOC Kit Contents

Chemical/s	Container	Preservative
EDB/DBCP (EPA 504.1)	2-amber 40 ml VOA	Na ₂ S ₂ O ₃ , <6°C
PCBs (EPA 508)	4-amber 1 L	Na ₂ S ₂ O ₃ , <6°C
Herbicides (EPA 515.4)	4-amber 60 ml VOA	Na ₂ SO ₃ , <6°C
SemiVolatiles (EPA 525.2)	4-amber 1L	Na ₂ SO ₃ /post HCl, <6°C
Pest/Carbamates (EPA 531.1)	4-amber 40 ml VOA	Na ₂ S ₂ O ₃ /MCAA, <6°C
Glyphosphate (EPA 547)	2-amber 40 ml VOA	Na ₂ S ₂ O ₃ , <6°C
Endothall (EPA 548.4)	4-clear 8 oz or 4 oz jars	Na ₂ S ₂ O ₃ , <6°C
Diquat (EPA 549.2)	4-clear 8 oz jars	Na ₂ S ₂ O ₃ , <6°C

Collecting Samples

- Identify the sampling location using the water systems Annual SDWA Sampling Schedule, Entry Point (EP) Tags, and/or Sampling Plans



- Remove any aerators
- Don't rinse out the bottles
- Hold the bottles at a 45° angle when you fill them
- Don't splash when filling the bottles

A Word on Collecting Organic Samples

- Gas, oil based fluids, smoking, hairspray, mousse, cologne, perfume, breath spray, mouth wash can contaminate organics samples
- Make sure all vehicle or other engines are off when collecting samples as exhaust can also contaminate organics samples
- Wash hands thoroughly or wear gloves when taking samples
- Trip Blanks – VOC samples from Accurate Labs for EPA Region 6 water systems may include a trip blank. Do not open the trip blank. It should be left untouched in the cooler.

Collecting Nitrate-Nitrite

Bottle Requirements

1-500 mL plastic bottle preserved with H₂SO₄ (sulfuric acid)

Sampling Location

The Entry Point to the Distribution System (EP)

Sampling Instructions

Take caution with the preservative – sulfuric acid is a concentrated acid.



1. If not already running, turn on the well and treatment system that is scheduled for compliance sampling and let run until the water quality produced is judged to be what is produced under normal operating conditions. If sampling after a direct pumping tank then start at step 2.
2. Flush through the sampling point.
3. Reduce the sample stream and take and record the free residual chlorine as applicable on the COC.
4. Fill the 500 mL plastic bottle (with H₂SO₄) for Nitrate-Nitrite to the shoulder. Cap and mix the sample.
5. Label the sample bottle and fill out the COC.
6. Samples need to be kept at <6°C and if possible, delivered to the lab the same day that they are taken.

Collecting Fluoride

Bottle Requirements

A 1 L plastic bottle (unpreserved)

Sampling Location

The Entry Point to the Distribution System (EP)

Sampling Instructions

1. If not already running, turn on the well and treatment system that is scheduled for compliance sampling and let run until the water quality produced is judged to be what is produced under normal operating conditions. If sampling after a direct pumping tank then start at step 2.
2. Flush through the sampling point.
3. Reduce the sample stream and take and record the free residual chlorine as applicable on the COC.
4. Fill the 1 L plastic bottle (unpreserved) for Fluoride to the shoulder and cap the sample.
5. Label the sample bottle and fill out the COC
6. Samples need to be kept at $<6^{\circ}\text{C}$ and if possible, delivered to the lab the same day that they are taken.



Collecting Drinking Water Metals

Bottle Requirements

1-500 mL plastic bottle
preserved with HNO₃ (nitric acid)

Sampling Location

The Entry Point to the
Distribution System (EP)

Sampling Instructions

Take caution with the preservative – nitric acid is a concentrated acid.



1. If not already running, turn on the well and treatment system that is scheduled for compliance sampling and let run until the water quality produced is judged to be what is produced under normal operating conditions. If sampling after a direct pumping tank then start at step 2.
2. Flush through the sampling point.
3. Reduce the sample stream and take and record the free residual chlorine as applicable on the COC.
4. Fill the 500 mL plastic bottle for Drinking Water Metals to the shoulder. Cap and mix the sample.
5. Label the sample bottle and fill out the COC.
6. Samples need to be kept at <6°C and if possible, delivered to the lab the same day that they are taken.

Collecting Total Cyanide

Bottle Requirements

1-500 mL brown plastic bottle with NaOH (sodium hydroxide) taped on the outside to be added after filling

Sampling Location

The Entry Point to the Distribution System (EP)

Sampling Instructions

Take caution with the preservative – sodium hydroxide is caustic.

1. If not already running, turn on the well and treatment system that is scheduled for compliance sampling and let run until the water quality produced is judged to be what is produced under normal operating conditions. If sampling after a direct pumping tank then start at step 2.
2. Flush through the sampling point.
3. Reduce the sample stream and take and record the free residual chlorine as applicable on the COC.
4. Fill the 500 mL plastic bottle for Cyanide to the shoulder. Add the vial of NaOH. Cap and mix the sample.
5. Label the sample bottle and fill out the COC.
6. Samples need to be kept at $<6^{\circ}\text{C}$ and if possible, delivered to the lab the same day that they are taken.



Collecting Radiologicals

Bottle Requirements

A 4-Liter plastic cubitainer

Sampling Location

The Entry Point to the Distribution System (EP)

Sampling Instructions

1. If not already running, turn on the well and treatment system that is scheduled for compliance sampling and let run until the water quality produced is judged to be what is produced under normal operating conditions. If sampling after a direct pumping tank then start at step 2.
2. Flush through the sampling point.
3. Reduce the sample stream and take and record the free residual chlorine as applicable on the COC.
4. Blow up the 4-liter cubitainer with your mouth and fill it to the shoulder and cap the sample.
5. Label the sample bottle and fill out the COC.
6. Samples need to be kept at $<6^{\circ}\text{C}$ and if possible, delivered to the lab the same day that they are taken.



Collecting VOCs

Bottle Requirements

3-40 mL VOA vials with ascorbic acid and maleic acid

Sampling Location

The Entry Point to the Distribution System (EP)

Sampling Instructions

Activities including pumping gas, working with oil or hydraulic fluid and smoking prior to sampling VOCs can result in a contaminated sample.



1. If not already running, turn on the well and treatment system that is scheduled for compliance sampling and let run until the water quality produced is judged to be what is produced under normal operating conditions. If sampling after a direct pumping tank then start at step 2.
2. Flush through the sampling point.
3. Reduce the sample stream and take and record the free residual chlorine as applicable on the COC.

4. Fill the vials until a reverse meniscus forms at the top (see photo). Cap and turn the bottle upside down and tap to ensure that there are no air bubbles present. If air is observed, uncap the vial and add a little sample until there is no air present in the sample.



5. The lab will not accept the samples if air is present.
6. Label the sample bottles and fill out the COC.
7. Samples need to be kept at $<6^{\circ}\text{C}$ and if possible, delivered to the lab the same day that they are taken.

Collecting SOCs



Bottle Requirements

Various – See Table 3 “Accurate Labs Full SOC Kit Contents”

Sampling Location

The Entry Point to the Distribution System (EP)

Sampling Instructions

Take caution with the preservative – hydrochloric acid is a concentrated acid.

1. If not already running, turn on the well and treatment system that is scheduled for compliance sampling and let run until the water quality produced is judged to be what is produced under normal operating conditions. If sampling after a direct pumping tank then start at step 2.
2. Flush through the sampling point.
3. Reduce the sample stream and take and record the free residual chlorine as applicable on the COC.
4. Fill the 4-1 Liter amber bottles for PCBs to their shoulder. Cap and mix the samples.

5. Fill the 4-8 oz jars for diquat and the 4-8 oz or 4 oz jars for endothall to their shoulder. Cap and mix the samples
6. Fill the 4-1 Liter amber bottles with the hydrochloric acid vial taped to them for SVOCs to their shoulder. Cap and mix the samples. Uncap the bottles and add the vials of HCl. Cap and mix the samples.
7. For the VOA vials for EDB, herbicides, pesticides/carbamates and glyphosphate, fill the vials until a reverse meniscus forms (see photo). Cap and turn the bottle upside down and tap to ensure that there are no air bubbles present. If air is observed, uncap the vial and add a little sample until there is no air present.
8. The lab will not accept samples if air is present.
9. Label the sample bottles and fill out the COC.
10. Samples need to be kept at $<6^{\circ}\text{C}$ and if possible, delivered to the lab the same day that they are taken.



Collecting Stage 1 & 2 DBPs (TTHMs and HAA5s)

Bottle Requirements

TTHMs – 2-40 mL
Amber VOAs
preserved with
 $\text{Na}_2\text{S}_2\text{O}_3$

HAA5s – 2-60 mL
Amber VOAs
preserved with
Ammonium Chloride

Sampling Location

The location of
Chlorine Maximum
Residence Time
(MRT) in the
distribution system
that is identified on
the water systems
Stage 1 & 2 DBP Sampling Plans



Sampling Instructions

TTHMs and HAA5s must always be sampled together in order to be counted for compliance purposes.

1. Flush through the sampling point until main distribution water is coming through the sampling point.

2. Reduce the sample stream and take and record the free residual chlorine as applicable on the COC.
3. Fill the vials until a reverse meniscus forms at the top (see photo). Cap and turn the bottle upside down and tap to ensure that there are no air bubbles present. If air is observed, uncap the vial and add a little sample until there is no air present in the sample.
4. The lab will not accept samples if air is present
5. Label the sample bottles and fill out the COC.
6. Samples need to be kept at $<6^{\circ}\text{C}$ and if possible, delivered to the lab the same day that they are taken.



Labeling Bottles

Using a permanent marker, at a minimum write directly on the bottle the following information:

- PWS Name & Number
- Sample Location (Facility Name or ID)
- Date & Time of Collection
- Analysis Requested

Filling out the Chain-of-Custody

The Chain-of-Custody (COC) is an important document that needs to be completely filled out in order for a sample result to be used for compliance purposes.

The Accurate Labs COC that should be used for submitting compliance samples has been specifically customized for EPA Region 6 Tribal Drinking Water systems. An example of a blank version of this COC is shown on the next page. You can get the latest version of this COC from the lab or by contacting either Rose or Matt or on the Resource web page for the SW EFC Tribal Drinking Water Program.

Instructions for Filling out the COC

1. Use a different Chain-of-Custody (COC) for each sampling location.
2. ***** Do not make duplicate requests for the same contaminant or contaminant group on the same COC. *****
3. Starting at the top left of the COC, fill out the contact information for the Client (Water Utility) and the Regulatory Compliance Office for this Public Water System (PWS), this is who the report will be sent to.
4. Fill out the Sample Information section using the definitions below:
 - a. **Routine** - Samples taken for compliance with the Safe Drinking Water Act (SDWA). Refer to the EPA Sampling Schedule for each PWS.
 - b. **Confirmation** - Samples are for compliance purposes and are taken at the request of EPA Region 6 to verify the level of a specific contaminant or contaminant group.
 - c. **Special** - Samples taken are not for compliance with SDWA.
 - d. **Grab** - A single sample collected at a particular time and place that represents the composition of the water only at that time and place.
 - e. **Composite** - A series of small samples taken over a given time period and combined as one sample in order to provide a summary of water quality.

- f. **Finished** - Samples are taken after the treatment process at the entry point. If there is no treatment process, then the water is considered finished water.
 - g. **Raw** - Samples are taken before the treatment process and represent the water quality of the water source.
5. If sampling for SDWA compliance purposes at the Entry Point to Distribution, use the metal tag or the Sampling Schedule for the water system and on the COC, fill out PWS ID, Facility ID, Sampling Point ID, PWS Name and Facility Name. This information is required for compliance purposes. You may fill out Sampling Location with a local name or you may leave it blank. If sampling for chlorinated disinfection byproducts in distribution, use a Facility ID of **01000**, a Facility Name of **Distribution System** and the Sampling Point ID in your Stage 2 DBP sampling plan.
 6. Under Sampler fill out the full name of the person collecting the samples.
 7. If you are sampling finished water and the system is disinfected with chlorine, mark **Yes** and take a Free Chlorine Residual and write it down in this box. If the system is not disinfected mark **No**.
 8. For each requested contaminant or contaminant group, use one row and mark the Date and Time the sample was collected. Also write down the Container Type and Number as well as the Preservative Type. If the request has multiple containers and preservatives (like SOCs), then mark as 'Various' in these boxes. Put an X in the

appropriate row under the group for which you are requesting analysis be done.

9. Certify that the samples were taken under normal operating conditions by signing this COC, record the Date & Time as well as the name of the person taking the samples and who they work for.
10. Fill out the contact information for where the report should be mailed.
11. If the compliance sample is for a water system that is having their samples paid for by EPA Region 6, make sure that the “Mail Invoice To” section contains the information for the NM Environmental Finance Center. If the sampling is not for compliance purposes, or the water system is considered by EPA to be “for-profit” and pays for its own compliance samples, make sure that the “Mail Invoice To” section contains the information needed for Accurate Labs to bill the water system.
12. Make sure to sign this COC with the Date and Time whenever the sample and COC are transferred from one individual to the next or when delivered to the lab.

Delivering Samples to the Lab

Samples must be kept cold from the time they are collected until they delivered to the lab.

Samples should be delivered to the lab the same day they are taken but if something comes up you should be aware of the Hold Times in Table 2 that are associated with each sample type.

Be aware of any changes to the normal laboratory schedules for sample acceptance especially around major holidays.

Pickup any sample bottles for future sample collection requirements.

EPA Region 6 Drinking Water **Contaminant Groups**

Disinfection By Product Rule (DBPR)

For systems using chlorine disinfection:

Total Trihalomethanes (TTHMs) - chloroform, bromoform, bromodichloromethane, dibromochloromethane

Haloacetic Acids (HAA5s) - monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, dibromoacetic acid

For systems using ozone disinfection:

Bromate

For surface water systems using conventional filtration and disinfection:

Raw water alkalinity, raw water total organic carbon (TOC), treated water TOC

Inorganic Chemicals (IOCs) – 11

Drinking Water Metals (9) - arsenic, antimony, barium, beryllium, cadmium, chromium, mercury, selenium, thallium

Total Cyanide

Fluoride

Volatile Organic Chemicals (VOCs) -21

benzene / carbon tetrachloride / chlorobenzene / o-dichlorobenzene / p-dichlorobenzene / 1,2-dichloroethane /

1,1-dichloroethylene / cis-1,2-dichloroethylene / trans-1,2-dichloroethylene / dichloromethane / 1,2-dichloropropane / ethylbenzene / styrene / tetrachloroethylene / toluene / 1,2,4-trichlorobenzene / 1,1,1-trichloroethane, 1,1,2-trichloroethane / trichloroethylene / vinyl chloride / xylenes (total)

Synthetic Organic Chemicals (SOCs) – 29

2,4-D / 2,4,5-TP (Silvex) / alachlor (Lasso) / atrazine / benzo(a)pyrene (PAHs) / carbofuran / chlordane / dalapon / di(2-ethylhexyl) adipate / di(2-ethylhexyl) phthalate / 1,2 – dibromo-3-chloropropane (DBCP) / dinoseb / diquat / endothall / endrin / ethylene dibromide / glyphosate / heptachlor / heptachlor epoxide / hexachlorobenzene / hexachlorocyclo-pentadiene / BHC-gamma (Lindane) / methoxychlor / oxamyl (Vydate) / pentachlorophenol / picloram / polychlorinated biphenyls (PCBs) (Aroclors) / simazine / toxaphene

Gross Alpha, Combined Radium (226/228) and Uranium (Radionuclides – 4)

alpha emitters (gross alpha) / beta/photon emitters (gross beta) / radium 226 & 228 (combined) / uranium (combined)

Lead & Copper Rule (LCR)

Coordinate with EPA Region 6

Definitions & Abbreviations

Caustic – Capable of burning, corroding, dissolving, or eating away by chemical action

COC – Chain-of-Custody

DBP – Disinfection Byproduct

Direct Pumping – Used to describe a water storage tank where the inlet is separate from the outlet.

EPA – Environmental Protection Agency

EP – Entry Point to the Distribution System – Identified by a metal tag containing sampling point information.

H₂SO₄ – Sulfuric Acid – A preservative used for nitrate-nitrite.

HAA5 – Haloacetic Acids (DBP from chlorination)

HCl – Hydrochloric Acid – A preservative used for VOCs and some SOCs

HNO₃ – Nitric Acid – A preservative used for Drinking Water Metals and Radiologicals.

Hold Time – The time allowed between a sampling event and when sample analysis must occur.

IOC – Inorganic Chemical

NaOH – Sodium Hydroxide – A preservative used for Total Cyanide.

PWS – Public Water System

RCO – Regulatory Compliance Officer

SDWA – Safe Drinking Water Act

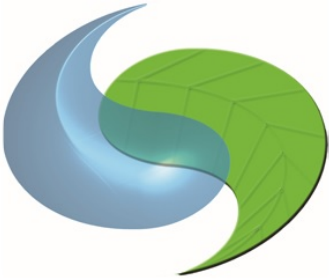
SOC – Synthetic Organic Chemical

Trip Blank – A sample of analyte-free media taken from the laboratory to the sampling site and returned to the laboratory unopened. A trip blank is used to document contamination attributable to shipping and field handling procedures.

TTHM – Total Trihalomethanes (DBP from chlorination)

VOA Vial – Volatile Organic Analysis Vial

VOC – Volatile Organic Chemical



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Prepared by the Southwest Environmental Finance Center
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