DRINKING WATER SAMPLING GUIDE

2018 EDITION

Water Supply Division

Texas Commission on Environmental Quality

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Public Water System Supervision Program

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Section 1—Introduction

Drinking water sampling is required to determine whether harmful chemicals or microbes are present in public drinking water supplies. Analytical sample results used to determine regulatory compliance with drinking water standards [Title 30 Texas Administrative Code (TAC) Chapter 290, Subchapter F] begin with good, reliable sample collection. Every sample result must be legally defensible from collection, through analysis, to reporting or data transfer.

The purpose of this document is to provide guidance for the collection, storage, chain of custody (COC), and transportation of drinking water samples to the laboratory for analysis. The procedures outlined in this guidance are based on state and federal rules and regulations.

Specific sampling guidelines and techniques contained in this guidance are based on the US Environmental Protection Agency's (EPA) approved methods and the EPA's *Manual for the Certification of Laboratories Analyzing Drinking Water (MCLADW)*. The manner in which samples are collected and handled is critical to obtaining valid data. This guide includes written sampling protocols with specific sampling instructions to be used by sample collectors [MCLADW, §IV, 6]. These practices provide the minimum level of quality assurance (QA) necessary to ensure that samples analyzed continue to accurately reflect the quality of raw, treated, and distributed water supplies. They comprise "front-end" QA activities intended to supplement the laboratory analytical method QA and quality control (QC) activities already in place.

Intended Audience

This document is intended for individuals collecting routine chemical compliance samples at public water systems (PWS) in Texas and as part of the Quality Assurance Project Plan (QAPP) for the Public Water System Supervision (PWSS) Program. The only people that are authorized to do this are:

- Sample collectors under contract with the Texas Commission on Environmental Quality (TCEQ). This includes any current primary contractor and all of their sub-contractors performing work under the Drinking Water Compliance Sampling Services (DWCSS) Contract. In this document, these individuals are referred to as DWCSS "contract samplers."
- TCEQ regional investigators or other staff who collect special samples as part of investigative activities or customer complaints. In this document TCEQ regional investigators may be referred to as "region" staff or investigators. Collectively, contract samplers and regional investigators are referred to as "samplers."
- TCEQ compliance laboratories authorized to analyze drinking water samples under the TCEQ PWSS Program QAPP.

This guidance is NOT intended for individuals other than contract samplers, TCEQ staff, or TCEQ compliance laboratories. Others may use it as a reference. Sample collection instructions included in this guide are specific to the analytical methods listed. All chemical compliance samples must be collected by TCEQ DWCSS contract samplers or TCEQ staff and analyzed by the TCEQ designated drinking water compliance laboratories; there are NO exceptions.

Quality Assurance and Quality Control

QA refers to the systematic measurement, comparison with a standard, monitoring of processes, and an associated feedback loop that confers error prevention. Essentially, QA/QC is an integrated program which involves the planning, control, assessment, and quality improvements that are necessary to ensure that a product (in this case, field samples) or a specific service meets defined standards of quality within a certain level of confidence.

Formal, documented QA programs are a prerequisite for federal funding of environmental data activities. State law also requires formal QA programs for certain environmental activities. In order to receive funding, EPA requires that states have a Quality Management Plan (QMP).

The TCEQ has an agency-wide QMP, and the Water Supply Division (WSD) has a QAPP for the PWSS Program. These documents are updated annually or according to EPA requirements. They are maintained, reviewed and approved by TCEQ and PWSSP QA managers, various TCEQ staff, laboratories, and by the EPA. All drinking water data collection (including sample collection and analysis) are subject to EPA QA requirements. All samplers must be aware of and comply with relevant portions of these QA documents. This guidance is considered a part of the PWSS Program QAPP (Addendum 1); all contract sample collectors and compliance laboratories must adhere to requirements included in this guidance.

Logs used to record accuracy or calibration checks must be maintained for the duration of the applicable contract or as specified in the contract terms, whichever is longer. This includes logs used to record the accuracy and consistency of chlorine residual colorimeters, pH meter calibration, thermometer accuracy checks, and refrigerator temperatures. These logs also include all supporting documentation such as Certificates of Analysis, lot numbers and dates of use, calibration standards, and expiration dates. The logs and QA checks and other required documentation are specified in this guide and the PWSS Program QAPP.

Why Have Standard Sample Collection and Handling Procedures?

Standard procedures for sample collection, labeling, storage, and transportation to the laboratory help to ensure the integrity of water samples and resulting analytical data. Standard procedures and best practices facilitate uniform compliance monitoring throughout the state. This ensures uniform data for each sample collected at PWSs across the state. These procedures also help maintain the integrity of the information stored in the state's Safe Drinking Water Information System (SDWIS) database, and the federal Operational Data System (ODS) database—the databases of record for PWS compliance and inventory data.

Sample results are only reliable when samplers use standardized sample collection and handling procedures. Approved drinking water analytical methods produce reliable, high-quality data when laboratory and field personnel consistently use best practices when collecting, handling, and analyzing samples.

Public health protection is the ultimate goal of compliance monitoring. Success is dependent on proper sampling techniques and shall be taken seriously. Proper sampling

requires planning, knowledge of the analytical methods, familiarity with rules and regulations, and comprehensive training. This guidance is intended to answer questions relating to drinking water sampling at PWSs. Regulations as well as process changes do occur. At the beginning of the sampling season (before going in the field) samplers should always contact the WSD Drinking Water Standards Section (DWSS) at (512) 239-4691 for the most recent information and version of this guidance.

Note: An analysis is only as good as the sample collected. It is of the utmost importance that all samples are collected correctly, and that all handling and custody procedures are followed diligently.

Contract Samplers

Contract samplers must be certified by the TCEQ's PWSS Program to collect samples for compliance purposes under the Safe Drinking Water Act (SDWA). Contract samplers must be trained according to specifications defined in the DWCSS Contract and by the PWSS Program. Certification is handled by the DWCSS Contract Manager, who will administer and evaluate required tests. Contract samplers are expected to participate in TCEQ-provided annual training covering the material in this guidance. In addition, samplers must obtain and maintain a Class D Water Operator's License, or better.

Contract samplers shall be familiar with state regulations covered in Title 30 of the TAC Chapter 290 Subchapter F: *Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems*, and 30 TAC Chapter 290 Subchapter D: *Rules and Regulations for Public Water Systems*.

The state regulations are based on federal rules contained in Title 40 of the Code of Federal Regulation (CFR) Parts 141, 142, 143: *National Primary Drinking Water Regulations.* This guide is included as part of the PWSS Program QAPP and must be adhered to under the DWCSS Contract.

Section 2—Drinking Water Monitoring

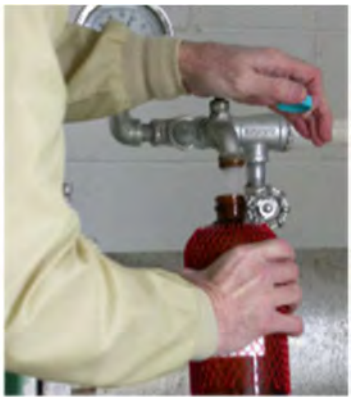
All PWSs are required by state and federal law to monitor their water for a variety of chemical and biological constituents. Some monitoring is performed by the PWS, such as disinfectant residual monitoring, lead and copper tap sampling, and bacteriological (coliform) sampling. Most "routine" chemical compliance sampling is performed by contract samplers. Title 30 TAC, Section 290, Subchapter F, lists the monitoring requirements for each type of PWS. This information is summarized in Table 2.1.

Table 2.1. Monitoring Responsibilities for Drinking Water

Monitoring Type and Associated Rule		**System Type***			
Organic Chemicals	§290.107	X	X		Contract Sampler
Microbial Contaminants	§290.109	X	X	X	PWS
Disinfection Byproducts (other than chlorite and bromate)	§290.115	X	X		Contract Sampler
Secondary Constituents	§290.118	X	X	X	Contract Sampler
Sodium	40 CFR §141.41	X			Contract Sampler
* C-Community, NTNC-Non-Transient Non-Community, NC-Non-Community (Transient); †Nitrate and Nitrite only					

Monitored vs Regulated Chemicals

There are many chemicals regulated in public drinking water for public health reasons. There are other chemicals that are not regulated but are measured as part of the process. Some analytical techniques provide data for these additional chemicals without increasing the analytical cost. Various volatile organic chemicals (VOCs) and synthetic organic chemicals (SOCs) are also detected and reported using the existing methods, but have no associated human health-based maximum contaminant levels (MCLs). For this reason, these chemicals covered in this manual are referred to as "monitored chemicals" rather than "regulated chemicals." For a complete list of regulated chemicals and approved drinking water methods, see <http://www.epa.gov/dwanalyticalmethods>.



Section 3—Sampling Locations

All PWSs are required to determine the locations of acceptable sampling sites and maintain the locations in a Monitoring Plan [30 TAC §290.121]. PWSs are also required to provide good sample taps at those locations and provide access to the TCEQ or DWCSS samplers. TCEQ regional investigators visit PWSs and review compliance with Monitoring Plan requirements.

The TCEQ central office DWSS staff uses the PWS' inventory data and sampling history to schedule samples based on a system's water sources, entry points, population, susceptibility and previous analytical results. See **Section 4** for details on sample scheduling. Sampling schedules vary based on different sample location types.

Sample Location Types

Source water samples—samples collected from groundwater (wells or springs) or surface water (rivers, streams, or lakes) prior to any type of treatment, including chlorination. These sample types are required for final source approval or confirmation of ground or surface water contamination.

Entry point (EP) samples—sometimes referred to as point-of-entry (POE), samples are collected after all treatment has been completed, but before the water enters the distribution system. Chemicals monitored at the EP include minerals, metals, radionuclides, VOCs and SOCs.

Distribution samples—samples collected within the PWS service area. Sample locations must be representative of distribution system conditions. Water from the distribution system is monitored for asbestos, DBPs, microbial contaminants, disinfectant levels, and lead and copper.

Detailed guidance for determining appropriate sample locations is provided to PWS operators in the TCEQ regulatory guidance titled *How to Develop a Monitoring Plan for a Public Water System,* RG-384. Information about population, sources, entry points, system status, sample sites, contact information, and other attributes of a PWS is called "PWS Inventory" data. These data are available to the public through the Texas Drinking Water Watch (DWW) website. The web address is <http://dww2.tceq.texas.gov/DWW/>.

Sample Location Data in SDWIS

All sampling location information is stored in SDWIS. Sample location records contain the facility ID, facility name, sample point ID, and sample location description. Table 3.1 provides information on each of these fields. The method of identifying and describing source water sample locations is presented in Table 3.2.

Table 3.1. SDWIS Sampling Locations

Description	**Field Name**	**Valid Content**
Facility ID	B_WSF_STATE_ASGN_ID	The identification code for a water system facility. An entry point (i.e. EP001), source (i.e. G1234567A), or distribution system (i.e. DS01)
Sample Point ID	B_SAMPLING_POINT	The identification code for a sampling point. All entry point sample points are "TRT-TAP", all source sample points are "RAW-TAP", and distribution sample points will vary (i.e. DPB2-01).

Table 3.2. Identifying and Describing Source Water Sampling Locations

Sources are a combination of the letter "S" (surface water) or "G" (ground water), the PWS ID and letters.	The PWS's designation for the source.	Always "RAW-TAP" for sources.	A description of the sample tap at the source. Always "WELL HEAD" for wells.
G1230001A	Well 1, Turkey Rd	RAW-TAP	WELL HEAD

Suitable Sampling Taps

PWSs are required to provide a suitable sample tap at all sampling locations [30 TAC §290.41(c)(3)(M), §290.42(b)(6)]. A suitable sample tap must be ready for use before the sampler arrives. A suitable tap shall:

- not be covered by vegetation
- be in an area that is safely and easily accessible
- be clean, pointing down with good clearance
- be easy to open, and
- have no hoses or tubing connected to it.

The contract sampler is required to document unsuitable sampling taps on a field report. The contract sampler cannot

determine suitable sampling taps but must defer to directions provided by the TCEQ as defined in the DWCSS contract.

Some PWSs may use special free-standing sample stations for some distribution sites. Lab taps are often available at surface water treatment plants (SWTP).

A service pump in a well house not using food-grade oil is not a good sample site. A contract sampler may detect this condition by smell or by observing the presence of non-food-grade oil containers in the area. Fumes from non-food-grade oil can be detected as contaminants in a VOC sample. Additionally, contamination may occur if volatile chemicals of any type, such as gasoline, paint, or solvents are used or stored near a sample site. If these conditions exist, the sampler must defer to directions provided by the TCEQ to determine an alternate sampling site.

Source Water Sampling Locations

A suitable site for source water sampling shall be before any treatment takes place and before any blending. For groundwater, sampling shall occur at the well head. Regulations state that a suitable sampling cock shall be provided on the discharge pipe of each well prior to any treatment [30 TAC §290.41(c)(3)(M)].

Source Water Sampling for Well Approval

Source water samples for plan review approval of a well are collected by the PWS or developer (and not the sampling contractor) when a well is first completed. Plan review approval samples are analyzed at a TCEQ-accredited lab chosen by the PWS. A list of accredited labs is available on the TCEQ website. The results must then be submitted to the Plan Review Team (PRT) before a well is approved for use.

After a well is granted plan review approval, the PWS must contact the Drinking Water Quality (DWQ) Team to schedule final approval samples. These samples will be collected by the TCEQ contract samplers and forwarded for analysis to one of the TCEQ compliance laboratories. PWSs are always responsible for the fees associated with the analysis of compliance samples.

Other sampling may be done at the well. For instance, if there is concern that the well is under the influence of surface water because of the geology, depth, or proximity to potential contamination sources, the well may be scheduled for additional sampling.

Additional sampling may also be needed when routine monitoring indicates the need for an investigation into the water quality of the aquifer.

Source Water Sample Collection

Make sure when sampling a well that it has been pumped/flushed for an adequate amount of time to eliminate water that has been sitting stagnant in the well casing. This ensures that water that is characteristic of the aquifer is being analyzed. For surface water, sampling should occur from a raw water tap at the treatment plant.

Examples of Well Sampling Locations






Entry Point Sampling Locations

Most routine chemical compliance samples are collected at the point where treated water enters the distribution system, called the entry point (EP). EPs are monitored for a variety of concerns (see Table 3.3). Regulations require that a suitable sampling tap be provided at a point representing water entering the distribution system at every EP [30 TAC §290.42(b)(6), (c)(5), (d)(14)]. The source of water may come from wells, springs, PWS owned SWTPs, a purchased water source, or a blend of sources.

Suitable Sites for Entry Point Sampling

EP sample sites must be located ***after*** all treatment and storage but ***before*** check or "slow-moving" valves and distribution.

Often, *non-community systems* have only a chlorination point and a pressure tank. A sample site may be before, on, or after the pressure tank or on a storage tank.

For *SWTPs*, the entry point sample site is often a faucet in the wet lab that provides fully treated water from the clear well.

A suitable EP sample site for ground water is typically a hose

ground storage tank (GST)

EP sample point on an above ground water line

bib off the discharge side of the service pump. Other suitable tap locations would be on a ground storage tank (GST), an elevated storage tank (EST), or a standpipe (STP). As a last resort, and only if absolutely necessary, the first connection can be used as an entry point sample site. Obviously, there are many systems that are not ideal and not all PWS operators are familiar with the concept of an entry point. See **Appendix E** for a list of commonly used abbreviations for sample tap locations.

Purchased Water vs Owned Water

Purchased drinking water is assigned an EP number whether it has only one source or has been blended with another source. Current TCEQ policy is to only collect samples for nitrate and nitrite at EPs where *only treated purchased water* enters a distribution system [30 TAC §290.102(f)]. The TCEQ may require purchased water EPs to be sampled if deemed necessary, or if there is reason to suspect a water quality change from wholesaler to purchaser. Purchased water is normally sampled only in the system where the water is produced; however, a PWS that purchases water exceeding an MCL is required to monitor at the take point to determine compliance. If purchased water (usually treated surface water) is blended with owned water (typically ground water) through the same EP, then it should be scheduled for sampling according to the monitoring type of the owned water (typically ground water).

DEFINITIONS—Sources of Water	
Owned	A source of water that the system is responsible for producing.
Purchased	Water that a system obtains under any relationship, whether actually paid for or provided without charge. Sometimes a water system that wants to control its own distribution system has a meter on another water supply. This is also considered "purchased".

Examples of Entry Point Sampling Locations

Tap on a ground storage tank (GST)

Tap on a booster pump (BP)

Tap on a pressure tank (PT)

Tap in a water treatment lab

Surface Water Treatment Plant (SWTP)

Pump House (PH)

Elevated storage tank (EST)

Ground Storage Tank (GST)

Standpipe

Identifying Entry Points in TCEQ Data

EPs are identified in TCEQ data with a code (facility ID), facility name, sample point, and tap location. The PWSS Program has added the facility name and tap location to the electronic sampling schedule. This information is included on the tablet or printed on the contractor-generated sample submission forms to help identify EPs. Latitude and longitude coordinates are also provided for the EP location when available. The PWSS Program works with the TCEQ regional investigators to get a brief description of the sample site and more descriptive facility names to go along with the facility ID (see Table 3.4).

Every PWS is required to have a Monitoring Plan that includes a list of EPs [30 TAC §290.121(a)].

Table 3.3. Identifying Entry Points

Entry points are numbered sequentially and start with "EP". An entry point is considered a "facility"	The location of the sample site. Should be descriptive enough to locate easily.	Always "TRT-TAP" for entry points.	A description of the sample tap at the entry point.
EP001	Jones Plant, 123 Main St, Llano	TRT-TAP	GST

Inactive Entry Points

EPs are numbered sequentially, and numbers are never reused. For example, a system has two entry points, EP001 and EP002, and EP001 becomes inactive. Later, when a new EP is added, it would be numbered EP003. EP001 can't be reused. This is because historical sampling data has already been associated with this EP.

Permanent (P), Seasonal (S) and Emergency (E) Entry Points

EPs whose availability is permanent or seasonal are routinely sampled; emergency EPs may be sampled under a reduced schedule. Permanent means that the water used is almost always the primary source of drinking water for the system. It is generally easy to identify permanent sources and EPs. The distinction between seasonal and emergency sources is important. A PWS may perceive that a well is an emergency source, when the TCEQ would define it as seasonal. The

TCEQ must approve any change in EP activity status.

Seasonal sources are used to meet increased seasonal demand such as for irrigation during dry summer months

DEFINITIONS—Operational Status	
Permanent	A water source that is used regularly, a primary water source.
Seasonal	A water source (usually a well) that is used periodically or annually to meet seasonal or monthly needs. Generally, it has a direct pipe to the system.
Emergency	A water source that is not used on a routine or annual basis. This type of source is generally not even plumbed or is air gapped. It is an emergency source if it is used only when disaster strikes the operational or demand sources, such as during a prolonged drought or catastrophic equipment failure.

Purchased Water Entry Point Locations

Identifying a purchased water EP (take point) can be challenging. It must be located at or near the point where purchased water enters the PWS distribution system receiving the water. This could be a sample tap at the meter or take point, or the nearest connection.

Entry Points for Water Bottlers and Haulers

For water haulers, EP samples are collected from the hauling tank if filled from multiple locations. If the tank is **always** filled from the same source, the source can be sampled.

For water bottlers, EP samples are collected from water that goes directly into bottles, or from a bottle of finished product.

Invalid or Missing Information

If any EP descriptions are incorrect on the sampling schedule, a field report should be completed and submitted to the DWQ Program so that information can be corrected for future schedules. If the sample location is missing or incorrect on the water analysis form/tablet, it must be filled in by the sampler once the location is determined.

Distribution System Sampling Locations

PWSs collect many distribution system samples for self-reporting. Some examples include, disinfectant residuals, coliform samples, lead and copper samples, chlorite, ammonia, nitrite samples, and heterotrophic plate counts (HPC). In addition, TCEQ sample contractors collect chemical samples for asbestos and disinfection by-products (DBPs) in the distribution system.

Disinfection Byproducts–Formation and History

DBPs are potentially carcinogenic chemicals that are formed as a side effect of disinfection. Trihalomethanes (THMs) and haloacetic acids (HAA5) are DBPs that are formed when chlorine or chloramine reacts with naturally occurring organic matter (total organic carbon or TOC).

$$TOC + Cl_2 \text{ or } NH_2Cl \rightarrow \text{ THM and HAA5}$$

TOC, in the presence of chlorine or monochloramine, forms THMs and HAA5. This reaction also forms additional by-products such as nitrosamines; however, THMs and HAA5 are the main groups and the only contaminants currently regulated.

DBP formation varies depending on:

- *contact time between the disinfectant and the water*—more time generally increases the concentration;
- *temperature*—higher temperature causes more DBP formation, and formation occurs more rapidly;
- *disinfectant concentration*—more disinfectant leads to an increase in DBPs;
- *type of disinfectant*—free chlorine forms considerably more THMs and HAA5 than chloramines;
- *concentration of TOC*—more TOC causes more DBP formation; generally, there is significantly more TOC in surface water than in ground water;
- *pH*—different impacts for different disinfectants;
- *biological activity*—HAA5 may be biodegraded, but THMs do not;
- *bromide concentration*—bromide interacts with chlorine or chloramine and causes rapid formation of relatively high levels of THMs and HAA5 (some areas of Texas have high levels of bromide).

Factors such as contact time and temperature vary in the distribution system. This leads to varying concentrations of THMs and HAAs throughout the distribution system. Monitoring for DBPs occurs in the distribution system for this reason. The most important question from a public health and rule perspective is: "Where are the highest levels?" THM levels are highest where organic matter has the longest contact time with the disinfectant. THMs increase throughout the distribution system, regardless of biological activity. HAAs, however, have the potential for biodegradation by naturally occurring biofilm within the distribution system.

Stage 1 Disinfection Byproduct Rule

The Stage 1 Disinfection Byproduct Rule (DBP1) was adopted by the EPA in 1998. The regulatory requirements for total THM (TTHM) and HAA5 under DBP1 were replaced under the Stage 2 Disinfection Byproduct Rule (DBP2). Chlorite and bromate are still regulated under DBP1.

Stage 2 Disinfection Byproduct Rule

DBP2 was adopted by the EPA on January 4, 2006. It maintains the same MCLs but changes the sampling requirements and the way MCL compliance is determined. MCL compliance is now based on locational running annual averages (LRAAs) at each site, instead of the running annual average (RAA) of results from all sites within the distribution system. DBP2 compliance determinations are based on DBP2 data only–the compliance "clock" restarted when DBP2 monitoring began.

Stage 2 Disinfection Byproduct Rule (DBP2) Monitoring Locations

For DBP2 monitoring, the number of sample sites is based on the system population size and the predominant water type. A primary concept within the rule is to identify where DBP levels–and therefore risk–are greatest and focus sampling in those areas. To achieve this, early monitoring known as the Initial Distribution System Evaluation (IDSE), was completed between 2007 and 2010. Using this early monitoring data, initial DBP2 monitoring locations were selected and approved by the TCEQ.

Sample sites are kept as data, and data quality is important. For contractors, the sample point (code) and location (address) will be loaded on the tablet or pre-printed on the PWS Water Analysis Form. PWSs may request changes to sites through email to the DBP Program Coordinator <DBP@tceq.texas.gov>.

Monitoring Location Changes

Minor Changes

Minor changes to DBP sample sites can be done without TCEQ approval. This applies to sites next door or across the road from the original site listed on the sample contractor's tablet or pre-printed paperwork. Those changes arise, for example, when the old sample site is now a vacant lot, access has been denied, or there is an aggressive dog.

For minor DBP sample address changes follow these steps.

1. On ALL paperwork (or electronic equivalent), cross out the old DBP2-XX address, write in the new address, and write sampler initials next to changes.

2. On the pre-printed PWS Water Analysis Form (or electronic equivalent), in the "Comment" field, write a brief reason for the change and state "Minor change".
3. Sampler should send an email to<DBP@tceq.texas.gov>. If the change is made in the field, call (512-239-4691) and ask to speak to a DBP Program coordinator. You will need to provide the following information.
   - applicable PWS ID #,
   - original site location (DBP2-XX XXXX),
   - corrected site location (DBP2-XX XXXX),
   - a very brief reason for the change.
4. Once notified, TCEQ will update the TCEQ sample schedule for the next sample event.
5. Remind the PWS to update their monitoring plan.

Significant Changes

Significant changes to DBP2 sites require TCEQ approval. Examples of significant changes include,

- requesting to move the site to an alternative part of the distribution system/service area,
- more than a house or two away from the original sample location, or
- cancelling a DBP site altogether.

Note: Please remind systems to review their Monitoring Plan prior to your scheduled visit and to contact the DBP Rule Coordinator to approve significant changes before your arrival.

DBP2 monitoring must be done at locations where TTHM or HAA5 levels are highest and present the greatest risk to human health. If a system has only **one DBP2** sample site, it must be at the location with the highest TTHM. If a system has **more than one DBP2 sample site**, the system must include locations with the highest TTHM and HAA5 levels.

To make significant changes to sample locations a PWS should gather, if available, the following resources to help identify potential locations.

- Distribution system map, diagram, or schematic.
- Water quality data, including source water data, DBP2 data, disinfectant residuals, and HPC data.
- Distribution system operating data, including water flow, tank level and tank configuration data and locations where your system is booster chlorinating.

Using maps, and water quality and system operations data, a PWS should select sample locations where high TTHM and HAA5 are likely to occur. Below is a list of common locations where TTHM or HAA5 levels may be high.

- Downstream of storage tanks
- Dead end, but prior to last customer and prior to last hydrant
- Hydraulic dead ends and mix zones
- Downstream of booster chlorination
- Difficult to maintain disinfectant residuals
- Low but detectable residual levels
- High historical levels

If a PWS believes that HAA5 biodegradation is occurring, they are required to select sample locations between average and maximum water age. This is a point where biodegradation is not expected to be complete and where disinfectant residual is less than average but well over the minimum (0.2 mg/L, free or 0.5 mg/L total). PWSs must not select sample locations at a dead-end where there are no customers, prior to booster chlorination, or after the last hydrant or flushing point. It is unacceptable for a PWS to use an EP as a DBP sample location. If a sampler encounters such a case, they must contact the TCEQ for guidance or complete a field report.

For significant DBP sample location changes, do the following:

1. Request the PWS to contact the TCEQ by email <DBP@tceq.texas.gov>. If the change request is made in the field, the PWS should call (512-239-4691) and ask to speak to a DBP Program coordinator. The system should be prepared to provide:
   - PWS ID;
   - old and new sample locations; and
   - reason for the change.
2. If the change is approved verbally by TCEQ:
   - On ALL paperwork (or electronic equivalent), cross out (single line) the old DBP2-XX address, write in the new address, and write sampler initials next to changes.
   - On the pre-printed PWS Water Analysis Form (or electronic equivalent), in the "Comments" section, document the reason for the change and also write "change approved by [staff name] at TCEQ.

Summary

1. Whether or not you (or the PWS) seek approval from TCEQ to change sites, all changes must be communicated back to TCEQ so the change to the sample address can be reflected in SDWIS. Once TCEQ makes the change in SDWIS, the address change will be reflected in future sampling schedules.
2. Provide a brief reason for every DBP site change in the "Comments" section of the PWS Water Analysis Form (or electronic equivalent).
3. If you receive verbal or email approval from TCEQ staff for DBP sample site changes write "change approved by [staff name] at TCEQ" in the "Comments" section on the PWS Water Analysis Form (or electronic equivalent).
4. Make all paperwork consistent and initial changes on all forms. Any strike outs shall be made with a single line.

Requests to Postpone DBP Sampling

It is important for contract samplers to be aware that the TCEQ may postpone DBP sampling if a PWS makes a temporary change to treatment to address water quality issues. However, the PWS must adhere to the following procedure for making a temporary change to treatment from chloramines to free chlorine.

1. 30 days before switching, the system must notify PDW staff by letter or by email to <DBP@tceq.texas.gov>of the planned change in treatment method. The following information must be included in their notice.
   - PWS ID and name
   - PWS contact name, title, and phone
   - Estimated start and end date

- PWS ID and names of customer systems
- Reason for change in treatment (routine preventive maintenance; corrective maintenance due to nitrification)

2. Coordinate this treatment change with appropriate adjustments in DBP sampling. In other words, DBP sampling shall accurately follow standard operating procedures.
3. PWSs should notify customers before the change occurs. The following information should be included in the notification.
   - A temporary change has been made to the treatment process to improve the quality of water being served to customers.
   - Some taste and odor changes may briefly occur, but there are no associated health risks.
   - The name and phone number of the person that customers can contact at the PWS if they have any questions.
4. It is fairly common for customers to notice (and complain about) changes in odor whenever disinfectants change. Some customers will notice the different taste of free chlorine; others may notice when you switch back and the chloramine wave front hits the chlorinated water in the distribution system. To minimize noticeable changes in taste or odor, increased flushing of distribution lines following each change is recommended. PWSs should monitor their distribution system for both free and total chlorine until levels stabilize to determine where odors are most likely to be noticeable.

In regard to contract sampler activities, reverting to free chlorine or shocking for a period longer than 30 days will be considered normal operating conditions, and no delay in sampling is permitted. Only THM or HAA5 sampling may be delayed because of a change in disinfectant.

NOTE	No other type of sampling shall ever be delayed because of a change in treatment.

Asbestos Monitoring Sites

Asbestos-cement (AC) pipe was used extensively in the mid-1900s in potable water distribution systems, particularly in the Western United States. Over time, AC pipe undergoes gradual degradation due to corrosion.

Systems that have AC pipe in their distribution system are vulnerable to asbestos contamination. Asbestos may also occur in source water erosion from geologic formations. There are known deposits of asbestos containing minerals in Blanco, Culberson, Gillespie, Hudspeth and Llano counties. A PWS shall choose sample sites that are most susceptible to contamination.

If a PWS knows they have AC pipe, they shall select site(s) after that line of pipe. If a system is unsure about the existence of AC pipe within their distribution system, they shall select site(s) at the furthest reaches of their distribution system. If the system is absolutely sure they have no AC pipe within their system, they may sample at or near the entry point.

Community or non-transient non-community water systems are not exempt from asbestos monitoring; they must monitor at least once every nine years.

If a sampler has a question about asbestos monitoring they should contact the PDW Program at (512) 239-4691.

Distribution Sites for Water Bottlers and Haulers

For water haulers, distribution samples shall always be collected from the hauling tank. When multiple tanks are utilized, a single tank shall be chosen as a representative tank.

For water bottlers, distribution samples shall always be collected from finished water or a bottle of finished product.

GPS Data for Sources and Entry Points

TCEQ maintains latitude and longitude data for EPs, wells, and surface water intakes. Sampling contractors may obtain Keyhole Markup Language (KML) files for use in Google Earth from the DWSS to aid in locating proper sample tap locations. Other file formats with locational data may also be available. See **Appendix O** for further information.

Source locations can also be accessed directly from DWW.

Section 4—How Samples Are Scheduled

This section presents a discussion on how chemical samples are scheduled. The TCEQ develops the annual sample schedule based on PWS information such as inventory and analytical data. The frequency of sample collection is based on regulations and policies described in **Section 5**.

Annual Sample Schedule

The PWSS Program in the TCEQ Central Office produces the annual sampling schedule and provides it electronically to the DWCSS contractor and laboratories as a database file. A draft is usually provided to the contractor and laboratories in mid-December for planning purposes. A final schedule is created in by the last week of December.

The DWCSS contractor reviews the final schedule, and then begins to schedule collection dates for their samplers. The schedule, in electronic form, is called YEAR_SDWIS_LST. YEAR is the calendar year, so, for example, the 2018 schedule would be 2018_SDWIS_LST. This schedule lists all normally scheduled samples for each PWS for the calendar year. Table B.1 of **Appendix B** contains the fields and definitions for the annual sample schedule table.

The annual schedule is maintained by the PWSS Program. The DWCSS contractor enters sample collection data and field report data into a separate database. At the beginning of each week, the sampling contractor sends the PWSS Program a data file that includes all the sample collection data for the preceding week. The PWSS Program then reviews the data and updates the schedule. The updated version is used for all compliance activities. Under no circumstance is the contractor allowed to enter data directly into the schedule table.

NOTE	Any samples that need to be collected by the contract sampler must be scheduled by the PWSS Program in the central office at (512) 239-4691.

Monthly Schedule Updates

Sampling schedules are subject to change during the year depending on sample results. There are also occasions when new PWSs are created or old PWSs are inactivated. The TCEQ provides the sampling contractor with a monthly electronic schedule update in the same format as the annual sampling schedule. The update includes all the original samples and any samples that are added, modified, or deleted from the original schedule. The sampling contractor reviews the monthly update and incorporates the changes into their work plan. The sampling contractor has 48 hours to review and incorporate changes from the time the update is received from TCEQ. Samples collected more than 48 hours after a monthly schedule update in which they were cancelled are not eligible for payment under the DWCSS contract.

Care is taken by TCEQ staff when scheduling quarterly samples during the last month of the quarter. It is difficult for sample contractors to respond in the few weeks remaining after the monthly update is processed. Priority samples can be ordered when appropriate.

Emergency/Priority Sample Schedule Updates

Occasionally, emergency or priority samples may need to be collected with a rapid turnaround. The monthly update process does not meet this need. Depending on the situation, TCEQ staff will contact the TCEQ Region or the sampling contractor and discusses the availability of samplers. Often, the TCEQ Region staff is more appropriate for certain activities. The DWCSS contract does have a 24- and 48-hour sample collection option that is used for rapid sampling situations, especially for organic and nitrate confirmation samples (potentially acute chemical hazards). A one or two-week turnaround "priority" sample option is also available. No matter which sampler is used the request needs to be documented by email and in the sample schedule.

Section 5—Monitoring Frequency

This section presents a general discussion on the required monitoring frequency of routine chemical compliance samples based on federal and state regulations and policies. More specific information on monitoring frequency and related sampler instructions are provided in **Section 6**.

Overview

All PWSs, are required to do some level of routine chemical compliance monitoring. Monitoring frequency depends on the type of system specified below and:

- Source type(s),
- Population,
- Susceptibility,
- Previous levels of chemicals detected,
- Violation status, or
- System-specific requirements.

PWSs may be required to complete additional monitoring if their water source is vulnerable to contamination, they have had a detection of a regulated chemical, or if they exceed a trigger level.

DEFINITIONS—Types of Public Water Systems	
Community **C**	A PWS which has a potential to serve at least 15 residential service connections on a year-round basis or serves at least 25 residents on a year-round basis. –Examples of community systems include municipalities or mobile home parks.
Non-transient non-community **NTNC**	A PWS that is not a community water system and regularly serves at least 25 of the same persons at least six months out of the year. –Examples of NTNCs include employers, large businesses with their own wells, day cares, and schools.
Non-community (Transient) **NC**	A PWS that is not a community water system and serves at least 25 persons at least 60 days out of the year, yet by its characteristics, does not meet the definition of a non-transient non-community water system. –Examples of NCs include restaurants, camps, rest stops, or parks.

Nine-Year Monitoring Framework

The EPA has defined a standard monitoring framework for many organic and inorganic chemical samples. This framework defines a compliance "cycle" as a nine-year period, made up of three, three-year compliance "periods". Most of EPA-required sampling follows this standard monitoring framework (see Table 5.1). TCEQ monitoring periods and cycles may differ from EPA; however, frequencies are identical.

Table 5.1 EPA Standard Monitoring Framework Monitoring Periods

9-year cycle									**9-year cycle**								
3-year **period**			3-year **period**			3-year **period**			3-year **period**			3-year **period**			3-year **period**		
2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
6-year **period**						6-year **period**						6-year **period**					

Each EP is scheduled according to the water monitoring type the system owns, not purchases (see Table 5.2). If a system blends its own water with purchased water, the chemical monitoring type will be the same as the owned water. For example, if a system owns a well and purchases surface water, and it is blended at an entry point, the monitoring type will be groundwater (G).

Table 5.2. Entry Point Water Monitoring Types

Code	Source Type	Special Concerns
S	Surface water	May be vulnerable to runoff of pesticides, fertilizer, pathogens, or spills
U	Ground water under the influence of surface water	
G	Ground water	May be vulnerable to plumes of contaminants

Routine EP monitoring follows the EPA standard monitoring framework. The required type and frequency of monitoring by system type is outlined in Table 5.3.

Some systems are on increased monitoring because of relatively high historical contaminant levels or violations.

Organic and Inorganic Monitoring Frequency

Decreased Organic Chemical Monitoring

EPA requires states to have an approved waiver program that allows decreased monitoring. TCEQ does not currently have an approved waiver program in place for organic chemicals.

TCEQ has granted state-wide waivers to all water systems for dioxin. This waiver was based on analysis of state-wide historical sampling data.

TCEQ does not routinely monitor for diquat, endothall, or glyphosate unless there is reason to believe a water source is vulnerable. All new surface water sources are monitored for these contaminants to determine vulnerability.

If an aroclor is detected when screened as part of EPA Method 508.1, then a confirmation sample must be ordered using EPA Method 508A.

Increased Monitoring

Certain organic chemical detections and certain inorganic chemical exceedances trigger increased monitoring. Any detection of a regulated organic chemical may be followed-up with confirmation sampling. Depending on the particular chemical detected and water source, the PWS may be sampled for confirmation for two to four consecutive quarters

[§290.107]. The detection of certain inorganic chemicals that exceed regulatory or trigger levels may result in an increase to annual or quarterly monitoring.

Increased Monitoring for Individual Analytes

The annual schedule also includes additional monitoring for individual compounds such as arsenic, fluoride, barium, radionuclides, etc. If a specific chemical is detected at levels higher than certain triggers, sampling will be increased to quarterly, so the chemical is closely monitored. If a specific chemical exceeds its MCL, the PWS will remain on quarterly monitoring until it is established that the chemical level is reliably and consistently below the MCL. Once this happens, the TCEQ *may* return the PWS to a less frequent monitoring frequency.

Nitrate/Nitrite Monitoring

All PWSs are required to monitor for nitrate annually. For guidelines on normal nitrate monitoring frequency, see §290.106(c)(6). High nitrate or nitrite levels will require an increase in monitoring frequency [§290.106(c)(6)(C)]. All PWSs must take one nitrite sample during the first three years of each 9-year compliance cycle.

Required routine monitoring frequency based on PWS type is outlined in Table 5.3.

Table 5.3. Required Routine Monitoring Frequency for Chemicals

System Type	Owned Ground Water EP Monitoring Type (G)	Owned Surface Water EP Monitoring Type (S, U)
C	Minerals, Metals, Cyanide and Synthetic Organic Chemicals (SOC) once every three years. Volatile Organic Chemicals (VOC) and nitrate annually. Nitrite once every 9 years. Radionuclides once every three, six or nine years depending on sample results.	Minerals, Metals, Cyanide, VOCs, and nitrate annually. Nitrite once every 9 years.
		SOCs once every three years.
		Radionuclides once every three, six or nine years depending on sample results.
NTNC	Minerals, Metals, Cyanide and SOCs once every three years. VOCs and nitrate annually. Nitrite once every 9 years.	Minerals, Metals, Cyanide, VOCs and Nitrate annually. Nitrite once every 9 years.
		SOCs once every three years.
	No Radionuclides	No Radionuclides
NC	Secondaries once every three years. Nitrate every year. Nitrite once every 9 years.	Secondaries and nitrate annually. Nitrite once every 9 years.

Purchased Water Monitoring

An EP fed by treated purchased water **only** will be required to routinely monitor for nitrate/nitrite at the EP. The assumption is that water quality will not change from the provider to the purchaser for most other chemical contaminants [40 CFR §141.29, 30 TAC §290.102(f)]. However, if the PWS receives water exceeding an MCL for a regulated chemical, it also needs to be sampled for that chemical to determine compliance. Depending on the system classification, a PWS that only uses treated purchased water is required to sample in the distribution system for asbestos, disinfectant residual, DBPs,

and lead and copper. Depending on the system classification, PWSs purchasing raw water are required to do all routine monitoring after treatment.

Disinfection Byproduct Monitoring Frequency—DBP2

All community and non-transient/non-community systems are required to conduct monitoring for total THMs and HAA5 [§290.115(a)].

The DBP2 rule introduced the concept of the combined distribution system (CDS)—a group of interconnected distribution systems. A CDS group includes all interconnected wholesalers, purchasers, and pass-through systems and is used only to determine a system's timing for phase-in of DBP2 compliance monitoring requirements.

Monitoring frequency is determined by system size (population), predominant water type, and past MCL compliance performance. See the Table 5.4 for reference.

Table 5.4. Routine and Reduced DBP2 Monitoring Frequency

Source Type	Population Size Category	Routine DBP2 Monitoring			Reduced DBP2 Monitoring		
		No.	Freq.	Location	No.	Freq.	Location
SW or GUI	< 500	1 or 2	AN	1 dual @ 1 location if high TTHM and HAA5 coincide	1 or 2	AN	Monitoring may not be reduced
				2 locations, 1@High TTHM, 1@high HAA5			
	500 - 3,300	1 or 2	QTR	1 dual @ 1 location if high TTHM and HAA5 coincide	1 or 2	AN	1 dual sample @ 1 location if high TTHM & HAA5 locations and quarter coincide
				2 locations, 1@High TTHM, 1@high HAA5			2 locations, 1@ high TTHM & 1@ high HAA5
	3,301 - 9,999	2	QTR	Dual sample sets @ each location	2	AN	1 Dual sample @ location & quarter w/ highest single TTHM
							1 Dual sample @ location & quarter w/ highest single HAA5
	10,000 - 49,999	4	QTR	Dual sample sets @ each location	2	QTR	1 Dual sample set: @ location w/ highest TTHM LRAAs
							1 Dual sample set: @ location w/ highest HAA5 LRAAs
	50,000 - 249,000	8	QTR	Dual sample sets @ each location	4	QTR	Dual sample sets: @ 2 locations w/ highest TTHM LRAAs
							Dual sample sets: @ 2 locations w/ two highest HAA5 LRAAs
	250,000 - 999,999	12	QTR	Dual sample sets @ each location	6	QTR	Dual sample sets: @ 3 locations w/ highest TTHM LRAAs
							Dual sample sets: @ 3 locations w/ highest HAA5 LRAAs
	1,000,000 - 4,999,999	16	QTR	Dual sample sets @ each location	8	QTR	Dual sample sets: @ 4 locations w/ highest TTHM LRAAs
							Dual sample sets: @ 4 locations w/ highest HAA5 LRAAs
	> 5,000,000	20	QTR	Dual sample sets @ each location	10	QTR	Dual sample sets: @ 5 locations w/ highest TTHM LRAAs
							Dual sample sets: @ 5 locations w/ highest HAA5 LRAAs

Table 5.4. Routine and Reduced DBP2 Monitoring Frequency

Source Type	Population Size Category	Routine DBP2 Monitoring			Reduced DBP2 Monitoring		
		No.	Freq.	Location	No.	Freq.	Location
GW	< 500	1 or 2	AN	1 Location = where high TTHM and HAA5 coincide	1 or 2	TRI	1 dual sample @ location if high TTHM & HAA5 locations & quarter coincide
				2 locations = 1@High TTHM, 1@high HAA5			2 locations, 1@ high TTHM & 1@ high HAA5
	500 - 9,999	2	AN	Dual sample sets @ each location	1 or 2	AN	1 dual sample @ location if high TTHM & HAA5 locations coincide
							2 locations, 1@ high TTHM & 1@ high HAA5
	10,000 - 99,999	4	QTR	Dual sample sets @ each location	2	AN	Dual sample sets: 1 @ location & during quarter w/ highest single TTHM result
							Dual sample sets: 1 @ location & quarter w/ highest single HAA5 result
	100,000 - 499,999	6	QTR	Dual sample sets @ each location	2	QTR	Dual sample sets: @ locations w/ highest TTHM LRAAs
							Dual sample sets: @ locations w/ highest HAA5 LRAAs
	> 500,000	8	QTR	Dual sample sets @ each location	4	QTR	Dual sample sets: @ locations w/ two highest TTHM LRAAs
							Dual sample sets: @ locations w/ two highest HAA5 LRAAs

Systems put on increased quarterly monitoring must collect dual sample sets at all locations

Asbestos Monitoring Frequency

Asbestos monitoring occurs on a nine-year monitoring cycle. PWSs with asbestos cement pipe in the distribution systems may require additional sample sites and more frequent monitoring.

A PWS that has detectable levels of asbestos or exceeds the MCL will be placed on quarterly monitoring until levels are reasonably and consistently below the MCL.

Community and non-transient non-community water systems are subject to asbestos monitoring.

Older water systems may have asbestos cement pipe within their distribution systems. Under the right conditions, asbestos particles may be released into the water supply.

Section 6—Sample Types

This section provides specific information on types of samples and how to collect them. The annual monitoring schedule determines the samples to be collected by the contract sampler (see Section 4). This section provides specific instructions on what samples are collected, by whom, and how to collect and handle individual sample types. Samplers are required to document sample type information on sample submittal forms which are discussed in **Section 10**.

Routine Samples (RT)

Routine samples or normally scheduled samples are those collected quarterly, annually, triennially, once every six years or once every nine years. Routine samples are collected by the contract samplers. Analytical results from routine samples may determine whether a system will qualify for increased or reduced monitoring. The detection of a regulated chemical, or a detected concentration above its MCL, may trigger increased sampling. (See Confirmation Samples) An absence of detections, or levels well below the associated MCLs, may qualify a system for reduced sampling. Reduced sampling requirements are reflected in the monitoring schedule.

Confirmation Samples (CO)

Confirmation samples may be required when a routine sample exceeds the MCL, or if there is reason to question the validity of a sample result. These are samples that require quick collection and analysis. These samples will either be collected as an emergency or priority sample by the TCEQ central office, contract samplers or by TCEQ regional staff. The analytical costs for these samples are usually billed to the PWS; however, on occasion the TCEQ may request that lab fees be billed to the TCEQ.

Special Samples (SP)

These are samples that are out of the ordinary. Three main types—Special Request, Process Control, and Investigation Samples—are described below.

Special Request Samples

Special request samples are those requested by the PWS when the sampler is in the field. These are often related to new wells and new EPs. This type of sampling is permissible only if the TCEQ Program is notified first and approves the samples prior to collection. The sampler shall call the TCEQ Sample Schedule Coordinator or Contract Manager for approval and obtain associated TCEQ ID numbers, if necessary.

Process Control Samples

These are samples the system is interested in for process control. These shall ***not*** be collected by TCEQ samplers. The DWCSS contract does not pay for these samples to be collected.

Investigation Samples

These samples are requested because of complaints, investigations, and possible contamination events. Contract samplers only collect these samples when the TCEQ regional staff are unable to do so.

"TCEQ Pay" Samples

Samples for which the TCEQ pays for *analysis* must be shipped to the DSHS laboratory. The TCEQ has an open purchase order and/or contract with DSHS used to pay for drinking water sample analysis.

Quality Assurance Samples

QA samples collected for public drinking water compliance must be collected and analyzed according to specific EPA-approved methods. No other methods are acceptable for public drinking water sampling. However, after researching EPA approved methods and after discussing this issue with QA officers from certified laboratories in Texas, and EPA QA representatives from Dallas and Cincinnati, EPA determined that most approved methods do not require field QA samples because:

- only certain chemical groups are likely to be contaminated during collection, and
- most analyses of drinking water samples result in an absence of detections, making a field QA sample redundant.

Additionally, all PWSs are monitored at least triennially. The DWQ Team has enough data to know which chemicals need further monitoring and attention. Chemicals of concern will be monitored repeatedly, providing temporal QA. In other words, if the contamination is real, repeat sampling will confirm it. If the contamination is not repeated, it is not a drinking water concern, or is an artifact.

Most QA activities required by EPA-approved methods occur in the laboratory and not in the field. However, where applicable, EPA approved methods generally recognize two types of field QA samples. The **field blank**, also called the "field reagent blank," is used to determine if method analytes or other interferences could have contaminated the sample during collection in the field. **Trip blanks** are used to determine if method analytes or other interferences could have contaminated the sample during the transportation and shipping process.

Field contamination is a problem only for a subset of regulated analytes. Analytes at risk of contamination in the field are included in the VOC and SOC groups. **Only methods approved for analyte measurement at risk of contaminating samples in the field require field blanks.** Therefore, no other groups of drinking water samples require any field QA sampling.

All VOC, Glyphosate and Ethylene dibromide (EDB)/1,2-dibromo-3-chloropropane (DBCP) samples will be collected with a field blank. See **Section 9** for details on collecting field blanks. Field blanks for other SOC sample types or trip blanks for VOC or SOC samples will not routinely be collected unless specifically requested by the TCEQ QA Manager.

Reagent-grade water must be used for field blanks. Field blank water is usually prepared by a laboratory. Field blank water must be tested to ensure it does not contain any measurable levels of VOCs or other target analytes. It must be refrigerated and stored in a manner that prevents any possible contamination prior to use in the field. Each bottle of field blank water is used only once. When opened, it may become contaminated from the surrounding environment. The sampler treats a field blank in the exact same manner as the sample being collected.

DEFINITION	
Field Blank	A **field blank**, or field reagent blank (FRB) is an aliquot of reagent water or other blank matrix that is placed in a sample container in the laboratory and treated as a sample in all respects, including shipment to the sampling site, exposure to sampling site conditions, storage, preservation and all analytical procedures. The purpose of the field blank is to determine if method analytes or other interferences are present in the field environment.

Emergency and Priority Sampling by the Contract Sampler

Emergency Samples (24/48 hours):

The contract between TCEQ and the DWCSS contractor makes provisions for certain samples to be collected very quickly, but at a higher cost to the TCEQ. Check "24 Hour" or "48 Hour" on the PWS Water Analysis form and write the word "EMERGENCY" at the top of the form (or in the tablet notes). Samples must be delivered by overnight shipping and analyzed by the laboratory as soon as possible. Laboratories will report results to the TCEQ immediately upon completion of the analysis. Some reasons for collecting an emergency sample include:

- Confirmation of nitrate or nitrite exceedances at a community or non-transient/non-community systems with susceptible populations
- Confirmation of organic exceedances under certain circumstances, including suspected groundwater contamination

TCEQ will determine the need for emergency samples and provide samplers with location(s) and sample types.

The DWCSS contractor is required to notify the TCEQ by close of business the same day emergency samples are collected. The TCEQ ID numbers of each sample must be included in the notice along with a copy of the Sample Collection Analysis Report (SCAR) (**See Section 10**).

Priority Samples (1 week / 2 week):

TCEQ may require certain samples to be collected quickly, but not in the emergency sample time frame. Check "1 Week" or "2 Week" on the PWS Water Analysis form and write the word "PRIORITY" at the top of the form (or in the tablet notes). Samples must be delivered to and analyzed by the laboratory as quickly as possible. Laboratories shall report results to the TCEQ as soon as possible.

Some reasons for collecting a priority sample include:

- An exceedance of an MCL at an EP.
- Detection of certain regulated chemicals like benzene, atrazine, and other analytes with the potential to contaminate source water.
- Confirmation of nitrate or nitrite exceedances at certain non-transient/non-community systems.
- Free cyanide confirmation of total cyanide detections
- New well samples for systems with capacity issues.

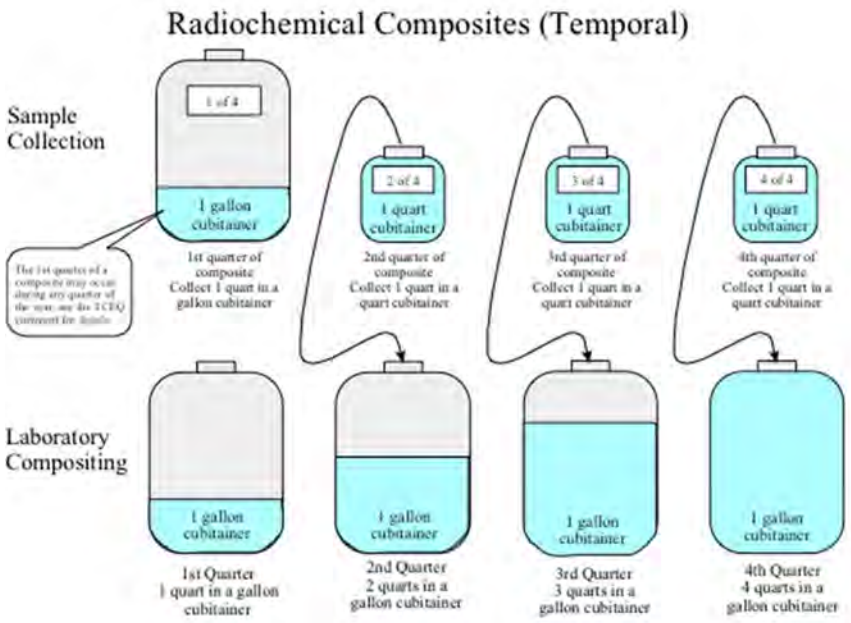
The sampling contractor is required to notify the TCEQ by close of business the same day priority samples are collected. The TCEQ ID numbers for each sample must be included in the notice along with a copy of the SCAR.

Composite Samples

Composite samples are appropriate in situations where an average value is acceptable. The only type of compositing allowed at this time is referred to as "temporal compositing." **Compositing individually-collected samples must be performed by the laboratory.**

Radiochemical Temporal Composites

The term "temporal composite" is used for a radiochemical sample collected over four calendar quarters from the same sampling site. In this case, the term "composite" means that a sample is collected once each calendar quarter for four consecutive quarters and the quarterly samples are combined together for analysis. The same site is sampled for all four quarters, with samplers collecting one quart each time. The first quarter is collected in a one-gallon container, and the remaining three quarters are collected in one-quart containers. Compositing is performed by the laboratory in a controlled environment. The benefit of temporal compositing is purely a financial one for the PWS. The PWS only pays for one analysis instead of four.



Radiochemical Grab Samples

Radiochemical samples that are scheduled for a one-time analysis are called "grab" samples. This involves the collection of one gallon of water in a single sampling event.

Quality Assurance Samples

The contractor is required to routinely collect VOC and SOC duplicates or triplicates for QC purposes as required by the laboratories. Duplicate and triplicate samples must be collected in a manner that ensures water in each bottle is exactly the same. These samples are used for QC measures required by the approved methods. SOC5 and SOC methods 515.4 and 531.1 require duplicate samples; the laboratories will provide the contractor with duplicate sample requirements including frequency and number.

Source Water Samples

Source water samples are collected from the source, either surface water or a ground water well.

Groundwater

Ground water sampling shall occur at the well head. Regulations require that a suitable sampling cock be provided on the discharge pipe of each well prior to any treatment [30 TAC §290.41(c)(3)(M)]. If a sample tap is not available, then the sample shall be taken as close to the wellhead as possible, preferably before the pressure tank, and always before any treatment. Note the absence of a suitable sample tap in the comments section of the PWS Water Analysis Form or tablet and complete a field report.

See **Section 8** for details on flushing a well prior to sample collection.

Surface Water

Source water from surface water shall be sampled from the raw water intake at the SWTP. Many SWTPs have a raw water sample tap in their lab.

Section 7—New Sites: Entry Points and Wells

New sites will be scheduled when the TCEQ determines that a PWS must initiate routine chemical monitoring. This occurs when a new well is drilled, when information or queries identify a new EP, when a new water system begins operation, or when an increase in population causes a status change from "inactive" to "active." New sites may be scheduled for a specific quarter or may be scheduled as annual.

New Sources

All new wells or surface water sources must be approved before use as a public water supply. A PWS must submit plans in advance to the TCEQ and submit bacteriological and chemical samples to determine if a source is suitable. See **Section 3**.

Plan Review Approval

The TCEQ Plan Review Team (PRT) sends PWSs a "Well Completion Letter" when a newly drilled or newly discovered well is approved for use. The PRT provides a list of chemicals that must be analyzed before granting approval. Samples for approval are collected by the PWS and not the TCEQ samplers.

Upon receipt and review of source water sample results, the TCEQ PRT reviews this data and notifies the PWS that the new well has received plan review approval to operate or disapproves the new well. If a primary MCL exceedance is found to exist, the water source will not be approved for use unless continuous treatment or blending is employed by the PWS to bring the water quality into compliance. If a secondary constituent level is exceeded, the PWS may receive *conditional* approval.

Final Approval

The Well Completion Letter includes a requirement that the PWS conduct final approval sampling. The letter states that the system must contact the DWQ Team to ensure that samples are collected within 180 days of the well completion letter date. The DWQ Team schedules new wells in the DWCSS contractor's monthly update and updates the site information in SDWIS. These samples must be collected within eight weeks as designated in the schedule with a season date range.

New wells need to be effectively purged prior to sampling. This clears the well of all deleterious matter which may be present after the drilling process. Properly purged new wells decrease the chance of not meeting water quality standards (see **Section 6**). When the sample contractor schedules an appointment with a PWS for new well sampling, he/she must make sure the system is aware of flushing requirements. Failure to meet water quality standards due to an improperly purged well can result in increased monitoring for the PWS.

Final Approval New Well Samples

Final approval of new wells requires the following samples be collected depending on the PWS type.

- *Community PWSs*—Minerals, Metals, Radionuclides, VOCs, EDB/DBCP, SOC5, SOC 515.4, SOC 531.1 and Nitrate/Nitrite.
- *Non-Transient/Non-Community PWSs*—Minerals, Metals, VOCs, EDB/DBCP, SOC5, SOC 515.4, SOC 531.1 and Nitrate/Nitrite.
- *Non-Community (Transient) PWSs*—Minerals, Metals and Nitrate/Nitrite. VOCs, EDB/DBCP, and SOC5; SOC 515.4, and SOC 531.1, if vulnerable.

The cost of sample analysis is the responsibility of the PWS. They will be billed by the laboratory.

Section 8—General Sample Collection

Previous sections addressed where samples are collected; how often they must be collected; the various types of samples; how new systems or wells are sampled; and sample scheduling. This section addresses both sample collection planning as well as sample collection. **Section 9** contains quick references for collecting specific sample types, and **Section 10** provides guidance for completing forms.

If a sampler has questions, he or she should contact the DWCSS contractor's project manager or secondarily the TCEQ contract manager.

Planning/Checklist

The most important goal of drinking water sampling is to ensure that high-quality representative samples are collected and submitted for the appropriate analyses in a timely manner. This requires planning. Using a checklist is helpful (Table 8.1). Proper equipment and supplies are required to ensure that work time and travel expenses are not wasted. Always consult the annual sampling schedule and update schedules so that you can make the best use of your time, equipment, and funds. Schedule updates are produced monthly throughout the year to pass on information regarding additions, deletions and other schedule changes (see **Section 4**).

Sometimes unexpected sampling situations arise during a visit. Always maintain a moderate supply of extra sampling equipment and supplies. It is usually better to collect a sample and then discard it later than to unnecessarily return to the same location.

Table 8.1. Checklist for Sample Collectors

	Don't forget to....	✓
1	Know your area and schedule efficient sample collection routes	
2	When scheduling a sample collection appointment with the PWS, ensure that all sampling locations are operational and that a monitoring plan is available.	
3	Keep detailed and legible scheduling notes of calls, routes, addresses, meeting places, and phone numbers.	
4	Prepare lab forms, bottles, and preservation chemicals in advance when possible.	
5	Locate the proper sampling location–confirm location by GPS and consult the PWS' Monitoring Plan when necessary.	
6	Calibrate, QC, and maintain field instruments as required.	
7	Keep detailed and legible sample collection records and record important information on Field Reports when necessary.	
8	Be professional and courteous. NEVER argue with PWS personnel.	
9	Think Safety: drive carefully and handle chemicals with caution; never speak on a cell phone or text while driving.	
10	ALWAYS double-check forms and containers before making shipments to the laboratories.	
11	Maintain a moderate supply of extra sample bottles and supplies for unplanned sampling.	

Professional Conduct

As a contractor for the TCEQ, you are a representative of the state. As such you are expected to dress and act professionally at all times. Jeans are acceptable as long as they are presentable; no rips, tears, or holes. Wear a clean shirt. T-shirts with slogans are not acceptable. Wear appropriate foot wear, preferably steel-toed work shoes or boots. Open toed shoes such as sandals or flip-flops are never acceptable.

Avoid confrontation with PWS officials. It is never appropriate to argue with a PWS official. If a matter of disagreement arises regarding sampling sites, schedules, collection procedures, etc., contact the TCEQ for guidance. If the matter cannot be resolved and the system insists on collecting or not collecting the samples, do as instructed by the PWS. Fill out a field report detailing the situation.

Supplies

All sample collectors (TCEQ staff, as well as contract samplers) are responsible for obtaining and using proper sampling equipment, supplies and preservation chemicals. The DWCSS contractor provides:

- amber glass bottles,
- 40 and 60 mL volatile organic analysis (VOA) glass vials,
- plastic containers,
- pipettes,
- pH meter calibration buffers,
- DPD reagents for chlorine analyzers,
- chlorine analyzer gel standards (consistency),
- chlorine analyzer standard solutions (accuracy),
- all sampling and field testing equipment, and
- chemical preservatives and reagents.

Chemical Preservatives/Reagents

All aliquots of reagents must be labeled, including the name of the chemical, a lot number and an expiration date. Chemical storage areas and each vehicle shall maintain copies of appropriate, well-organized, and accessible Safety Data Sheets. Reagents must be stored in a temperature-controlled environment away from potential sources of contamination and discarded after their expiration dates.

Sample Containers

Some sample types (i.e., VOCs, THMs) require more than one container per sample but only require one submission form per sample. For example, when a VOC is selected, you must submit two 40 mL VOA vials of drinking water and two 40 mL VOA vials of field blank water. All four containers are considered a single sample. **Section 9** lists the containers used for each sample type.

Unused sample containers and supplies must be stored in a manner that safeguards against degradation or contamination. Do NOT store in excessively hot areas, or where volatile chemicals are present, such as a garage. Stock chemical/reagent supplies must be properly labeled, including the received date, the date the container was first opened, and the expiration date. Chemicals and supplies must be stored according to label requirements but typically at room temperature.

Sample Container Labeling

The laboratory must be able to associate the sample submission form with the appropriate sample containers or the sample(s) will be rejected. This requires each sample container to be clearly identified.

EPA regulations require that each sample container label contain the following information [MCLADW, Appendix A, B2]:

- Sample ID number (TCEQ ID number),
- Source of sample (EP number, well code, or distribution sample point),
- Analysis type (MIN, MTL, VOC, etc.),
- Preservative used, and
- Sample collector's printed initials.

The container may be labeled with additional information if needed (i.e. PWS ID #). All information may be pre-printed onto container labels. However, caution shall be used when pre-printing collector's initials and dates since these are subject to change. Errors must be corrected by crossing out incorrect data with a single line and then initialing.

Traceability & Purity

The DWCSS contractor must ensure traceability of all consumables, field supplies and reagents. Chemicals, bottle ware, and reagents must be adequately tracked with lot numbers and expiration dates so that it can be determined what was utilized in the collection of specific samples. This includes buffers to calibrate pH meters, DPD used in determining chlorine residuals, dechlorinating agents, acid/bases used to adjust pH, etc. [MCLADW, Ch. IV, 4.1.1].

Chemicals and reagents used must meet any requirements specified in the methods. If not specified, then "Analytical reagent grade" (AR) or American Chemical Society (ACS) grade chemicals or better are required.

Sample Verification

Always double check your forms (or tablet) and containers before shipping samples to the laboratories. An extra five to ten minutes spent at the end of the day could save you the hours required to recollect rejected samples because of incomplete/incorrect paperwork, or mislabeled samples. Make sure that the samples are adequately iced so they arrive at the laboratory within the appropriate temperature range.

Paperwork

Section 10 contains a full discussion of the sample submission form (Public Water System Water Analysis Form), the Field Report form, and the COC form. Examples of each form are provided in **Section 10**.

NOTE	The PWS Water Analysis Form (or electronic equivalent) must be completely filled out and correct, or the laboratory is required to reject the sample. Each separate sample must be accompanied by its own PWS Water Analysis Form.

Sample submission forms must be completed when collecting samples for drinking water compliance. The forms are acceptable as long as all mandatory data is captured when filling them out. These forms are referred to generically as sample submission forms. An electronic equivalent, such as using a tablet computer, may be used to capture required information from the following:

- PWS Water Analysis Form (Sample Submission Form TCEQ-0351),
- And Chain-of-Custody (COC).

When using paper forms, the top original (white) goes to the laboratory. The first copy goes to the DWCSS contractor's main office to be submitted to the TCEQ laboratory, the second to the PWS, and the last copy to the sampler.

The DWCSS contractor will keep a record of all samples collected on the behalf of the TCEQ. The TCEQ also recommends that each collector maintain field notes of every sample collected. All parts of the PWS Water Analysis Form or SCAR (tablet equivalent) must be accurately and legibly completed or the sample may be rejected by the laboratory. If each form is not signed by both the sample collector and a PWS representative, the sample will be invalidated.

Remember that PWS Water Analysis and COCs are legal documents. These forms shall be completed carefully and clearly. Forging a PWS official's signature or intentionally providing false information on these forms is a violation of State and Federal law (felony), and can result in immediate termination, substantial fines and/or imprisonment.

It is not the laboratory's responsibility to make corrections to paperwork. Make sure that all paperwork is filled out correctly before shipping samples. Samples submitted with incomplete or inaccurate paperwork will be rejected by the laboratories.

In no case shall changes be made after the PWS representative has signed the submission form or SCAR unless the TCEQ has been consulted and grants permission; under these circumstances, all copies must be corrected identically.

A good set of personal field notes and/or copies of paperwork will provide the information you need when questions inevitably come up long after the sampling event has taken place.

Tap or Well Flushing

Generally speaking, all sample types discussed in this manual are intended to represent the quality of the water delivered to customers. For all samples discussed in **Section 8**, you must flush the tap long enough to make sure the water is fresh. A good rule of thumb is to flush until you can perceive a temperature change or until there is measurable chlorine residual (for EPs). In any case, you shall always flush the tap for *at least* **five minutes**.

To avoid sampling stagnant water, wells must be pumped/flushed a sufficient amount of time to remove standing water from the well casing. As a general rule, the removal of three to five well-casing volumes of water from a well is sufficient. This purges stagnant water from the well and replaces it with water representative of the aquifer.

Calculating the time needed to remove this amount of water is complex. Therefore, you should allow at least 15-30 minutes of pumping/ flushing before collecting a sample. The deeper the well, the longer it needs to be pumped. Ask the PWS representative the well

depth. Wells greater than 100 feet deep shall be flushed for the full 30 minutes. Failure to remove stagnant well water may adversely affect the analytical results, and the sample may have to be recollected. When scheduling this type of sample collection, notify the PWS of this requirement and request that they pump/flush the well for the appropriate time so it is ready to sample upon your arrival.

The tap or well flushing times and temperature readings are recorded on the PWS Water Analysis Form (or electronic equivalent).

Sample Collection

All appropriate procedures discussed in the following sections must be followed during sample collection, including field measurements preservation, holding, and shipping processes. Detailed sample collection requirements for specific analytes are discussed in **Section 9**.

Field Measurements

All field measurements that are to be recorded on the PWS Water Analysis form (or electronic equivalent) shall be gathered using the sampler's own equipment, NEVER the PWS operator's. All field measurements shall be conducted after flushing is completed and shall be recorded immediately on the sample submission form or tablet. Instruments must use approved methods if applicable.

For every sample, **including source samples**, the chlorine residual, temperature and pH must be measured and recorded on the PWS Water Analysis form or tablet.

Some samples require a pH adjustment for preservation purposes.

See **Section 11** for additional information on Field Measurements.

Preservation

Sample preservation is extremely important. It helps ensure that analytical results accurately represent the water collected. Unpreserved samples are invalidated by the laboratory. Ice is the most commonly used preservation method. Some of the chemicals used for preservation are very strong acids or bases. Use extreme caution in handling these chemicals and follow all instructions provided by the manufacturer's SDS. It is your responsibility to use appropriate eye, hand, and clothing protection. Do not add preservatives to sample containers, prior to collection, unless specifically allowed in a sample collection procedure.

WARNING!!	The TCEQ is not responsible for mishandled chemical preservatives. To avoid injuries, always follow appropriate safety precautions.

Reasons for Preservation

Some analytes may change form, increase in concentration, or decrease in concentration if a preservative is not added. For example, DBPs in chlorinated water will continue to form if the sample is not quenched with a reducing agent to inactivate the chlorine (dechlorinate). Preservatives are also used to retard microbial growth.

Chemical Preservatives

Strong acids or bases are the most common sample preservatives and may pose a health risk or hazard. Chemical preservatives must be handled with caution and all appropriate safety procedures followed. You may feel that safety precautions are burdensome; however, no amount of compensation can replace an eye or other body part damaged or lost due to the mishandling of a chemical. SDSs shall always be available wherever chemicals are stored, including vehicles.

Expiration dates and storage

Both the stock chemicals that are used to mix traveling stock, and the traveling stock (aliquots), have expiration dates. Do not use chemicals that have passed their expiration date(s). Check the expiration dates of your reagents every time you go out to sample. Make sure to store chemicals within their acceptable temperature range (see container label or documentation). Chemicals stored in excessive heat can degrade and may no longer perform as expected.

Sample Storage

Some sample types are temperature and/or light sensitive. Immediately after collection the samples shall be placed into an insulated and opaque container until transfer to the shipping cooler to limit exposure to sunlight and excessive temperatures.

Samples that cannot be immediately shipped to the laboratory for analysis shall be stored in a secure, temperature-controlled environment such as a dedicated and monitored refrigerator. A temperature log must be maintained to ensure samples are kept at proper temperature. See **Section 11**.

Shipping

The contract sampler is responsible for shipping all samples to the appropriate laboratory for analysis.

- Each sample must be accompanied by a PWS Water Analysis Form (or electronic equivalent).
- Each shipment must be accompanied by a properly completed COC form.
- When a sample is shipped to the laboratory, it must be packaged in an ice chest to avoid leakage and/or breakage during transit.
- Adequate ice shall be used to ensure that the samples reach the laboratory at the proper temperature.
- The laboratory must be able to associate each sample container in the ice chest with a corresponding PWS Water Analysis Form (or electronic data) and COC.

PWS Water Analysis forms and COCs shall be shipped inside the ice chest and must be placed in a plastic bag to prevent water damage. A good method is to use a zip-lock type bag taped to the underside of the ice chest lid. All ice chests must be sealed securely with shipping tape or strapping tape, etc. If electronic data is captured, it must be transmitted to the laboratory prior to sample arrival.

Each ice chest must be properly sealed to prevent tampering. Adequate custody seals must be used so that evidence of tampering is readily detected.

The complete address of the sender and the receiving laboratory must appear legibly on each ice chest. When sending samples using a shipping service, obtain a copy of the receipt with tracking information. Shipping information may be used as part of the COC documentation.

Holding Times

TCEQ and EPA certified laboratories must conduct the analyses within the prescribed method holding times in order to produce valid results. An even flow of samples to the laboratories must also be maintained throughout each sampling period to assure that laboratory capacity is not exceeded. This requires careful planning and coordination between collection and sample shipping by the contractor sampler. Ideally, the samples should be shipped on the day of collection for next day delivery to ensure holding times are not jeopardized. Samplers must ensure that samples are stored according to preservation requirements while in their custody. See **Section 9** for specific holding times for the various sample types.

NOTE	It is far better to spend a little extra money on ice and/or shipping expenses than to have an entire shipment of samples rejected at the lab because of failure to meet temperature requirements or holding times.

Sampling Priority

Quarterly sampling for nitrates, confirmations for MCL exceedances, and other violations must supersede all other routine samples. This includes both sample collection and analysis by the TCEQ's compliance laboratories. The TCEQ Sample Period field on the monitoring schedule will give the sampler and laboratory the type of sample to be collected. Sample periods that contain a "Q" are quarterly samples and shall be prioritized over annual samples (sample periods that contain a "Y"), both for collection, analysis, and reporting. The sampler or laboratory should call the contractor or the DWQ Program if there is any question on sampling priority.

Sampling Guidelines

Redundant Samples

Certain sample groups scheduled on an annual basis may contain analytes that occasionally overlap with individual analytes scheduled. These samples are kept on the schedule to allow the contractor maximum flexibility in scheduling. It is the responsibility of the contractor to include the individual samples as part of the sample group when necessary.

For example, if an EP has an annual minerals group sample (MIN) and quarterly nitrate (1st through 4th Q) scheduled, collect the MIN in any quarter that it is convenient for the sampler (the MIN includes the nitrate). Then cancel the nitrate for the quarter that the MIN is collected and make a note on the submission form or tablet. Make sure to collect the other nitrate quarters as scheduled. This policy applies to other single analytes that may be contained in a group sample. Samples that are unnecessarily collected and redundant will not be paid for by TCEQ. Special conditions apply for nitrate and nitrite sampling; refer to Table 8.2.

Table 8.2 - Nitrate & Nitrite Sampling

Scheduled	Residual	Collect	Cancel	Comments	Shipping
MIN + 1040	>0.2 mg/L	MIN	1040	1040 included with MIN, TCEQ ID #######	Normal
MIN + 1040	<0.2 mg/L	MIN + NO32	1040	1040 included with MIN, TCEQ ID #######	Overnight NO32
MIN + 1040 + 1041	>0.2 mg/L	MIN + 1041	1040	1040 included with MIN, TCEQ ID #######	Overnight 1041
MIN + 1040 + 1041	<0.2 mg/L	MIN + NO32	1040, 1041	1040/1041 included with NO32, TCEQ IDs ####### / #######	Overnight NO32
MIN + 1041	ANY	MIN + 1041	NA	NA	Overnight both
1040 + 1041	ANY	NO32	1040, 1041	1040/1041 included with NO32, TCEQ IDs ####### / #######	Overnight

Special Notes

Bottled Water Facilities—Collect EP samples for bottled water as you would any other water supply. This may entail taking a sample of the finished product if the bottled water stream is not flowing at the time of sampling. This may duplicate sampling bottled water companies conduct for DSHS for food and drug regulations; however, these samples are required by the TCEQ under the SDWA.

DBP Samples—Some PWSs have many DBP samples scheduled that cannot be reasonably collected in one day. You may collect these samples over a two-day period if the water supply does not change during this time. Regulations require that all samples be collected within a 24-hour period.

Section 9—Water Sample Collection Procedures

This section specifies sample collection procedures and analytical methods for all individual analytes or groups of analytes. All appropriate QA/QC procedures must be followed during sample collection, preservation, holding, and shipping. The sample preservation requirements listed in Table 9.1 are of critical importance and must be consistently and accurately completed. The PWS Water Analysis form must be correctly and completely filled out, or the laboratory is required to reject the sample. Each separate sample must be accompanied by its own PWS Water Analysis form. The preservation methods must be listed on the PWS Water Analysis form. Table 9.2 lists special notes and precautions associated with water sample collection.

Approved Analytical Methods

The list of approved analytical methods under the SDWA is available online at <http://www.epa.gov/dwanalyticalmethods>.

The methods listed online accurately reflect the promulgated methods specified in the CFR. The methods for determining primary contaminants are included in 40 CFR Part §141 with the expedited methods listed in Appendix A of Subpart C of Part §141. The methods for the secondary contaminants are included in 40 CFR §143 with the exception of pH, fluoride, and copper which are included in Part §141. The CFR is the legal reference for approved methods and take precedent over those listed in the tables online.

Note: For the TCEQ PWSS Program, only the methods listed in this section may be used to analyze samples.

Table 9.1. Water Sample Collection Procedures

ASBESTOS [1094]	
Submission Form	Mark form with analyte code "1094."
Special Note	Measure and record the chlorine residual, temperature and pH.
Container	Low density polyethylene (LDPE) plastic cubitainer or glass; 1 quart (1 L)
	[1 L PLASTIC OR GLASS]
Head Space?	A small amount is preferred by the lab.
Procedure	• Label each bottle with a waterproof marker. • Choose a sampling tap that represents the fresh water supply but where asbestos contamination is most likely to occur. • Remove all hoses, fittings, filters or screens. Samples shall not be taken from hydrants or faucets at dead-ends of distribution. • Let the water run for 5 minutes or until the old water in the service line in cleared. • Fill the cubitainer but leave head space so the lab can shake the container for mixing.
Preservation	• Iced (4°C)
	[COOL, 4C]
Analysis Time	Ship the cubitainer on ice overnight or by any method that allows the lab to filter the sample within 48 hours from the time you collect it. Do not ship on Friday. Ship to CRISP ANALYTICAL LAB only. **48 hour lab holding time**
Analytical Method	EPA 100.2
QA/QC	A method blank (one empty container) is required for every 20 samples. DO NOT use polypropylene containers. Contact the DWQ Team for asbestos sampling site guidance.

BETA RADIOCHEMICALS {BETA}	
Submission Form	Mark form with analyte group "BETA."
Special Note	Measure and record the chlorine residual, temperature, and pH.
Container	Hard or soft plastic, or glass; 1 gallon + 1 liter
	[1 GAL + 1 L PLASTIC OR GLASS]
Head Space?	Some head space is allowed.
Procedure	• Label each bottle with a waterproof marker. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. • Turn flow down to a smooth, pencil thin stream. • Remove cap from the bottle, tilt, and place under stream.
Preservation	• No field preservation • Icing is **optional**
	[NO FIELD PRESERVATION]
Analysis Time	Samples must be **received** by the lab within 5 days of collection. Ship to DSHS LAB only.
Analytical Methods	EPA 901.1, EPA 905.0, EPA 906.0, EPA 200.7
Analytes Measured	cesium 134, cesium 137, iodine 131, strontium 89, strontium 90, tritium, potassium, gamma emitting isotopes as detected
Other Notes	This group of methods is conducted as follow up to samples that exceed 50 pCi/L for gross beta radioactivity. The resulting analytical results are used to calculate the beta/photon emitter MCL in mrem/yr.

CYANIDE—TOTAL [1024] OR FREE [CNFR]	
Submission Form	Mark form with analyte code "1024" or "CNFR."
Special Note	Measure and record the chlorine residual, temperature, and pH
Container	Hard or soft plastic, or glass; 1 quart (1 L)
	[1 L PLASTIC OR GLASS]
Head Space?	Some head space is allowed
Procedure	• Label each bottle with a waterproof marker. • Add 100 mg of ascorbic acid to an empty bottle to dechlorinate. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. Turn flow down to a smooth, pencil thin stream. Remove cap from the bottle, tilt, and place under stream. • Fill half the container with sample water. Mix gently (DO NOT SHAKE) until the ascorbic acid is completely dissolved. • Finish filling the container leaving enough room for the sodium hydroxide (NaOH) • Add sufficient NaOH until a pH of between 12 and 12.5 is achieved. S**ee "Other Notes."** • Seal bottle and mix gently for one minute.
Preservation	• Iced (4°C)
	[ASCORBIC ACID, NAOH PH>12, COOL 4C]
Analysis Time	Samples must be *analyzed* by the lab within 14 days of collection. **Ship free cyanide samples to DSHS lab only.**
Analytical Methods	EPA 335.4; SM 4500-CN-F; Quickchem 10-204-00-1-X
Other Notes	Don't measure the pH in the sample bottle! Verify the amount of preservative to achieve proper pH for each sample in a separate container. *Samples with levels of total cyanide detected at or above the MCL will be confirmed with the free cyanide method.*

DIOXIN (2,3,7,8 TCDD) [2063]	
Submission Form	Mark form with analyte code "2063."
Special Note	Measure and record the chlorine residual, temperature, and pH.
Container	Amber glass; 1 L
	[1 L AMBER GLASS]
Head Space?	Some head space is allowed
Procedure	• Label each bottle with a waterproof marker. • Add 80 mg/L sodium thiosulfate to each container to dechlorinate. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. Turn flow down to a smooth, pencil-thin stream. Remove cap from the bottle, tilt, and place under stream. • Sampling equipment must be free of plastic tubing, gaskets, or other parts that may leach interfering analytes into the sample. • Fill the container with sample water. Mix for one minute until the sodium thiosulfate is completely dissolved. • If pH > 9, adjust to pH 7-9 with sulfuric acid (H_2SO_4). **See "Other Notes."** • Place samples in the dark immediately after collection.
Preservation	• Iced (4°C) • Store samples in the dark. (Very light sensitive)
	[SODIUM THIOSULFATE, H_2SO_4, COOL 4C, DARK]
Analysis Time	No demonstrated maximum hold time as long as samples are maintained at 4°C and in the dark.
Analytical Method	EPA 1613
Analytes Measured	2,3,7,8-tetrachlorodibenzo-*p*-dioxin
Other Notes	H_2SO_4 is a STRONG ACID: **USE CAUTION!**

DIQUAT [2032]	
Submission Form	Mark form with analyte code "2032."
Special Note	Measure and record the chlorine residual, temperature, and pH.
Container	Amber PVC high density plastic or silanized amber glass; 1 quart (1 L)
	[1 L AMBER PLASTIC OR GLASS]
Head Space?	Some head space is allowed
Procedure	• Label each bottle with a waterproof marker. • Add 100 mg/L sodium thiosulfate to each container to dechlorinate. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. Turn flow down to a smooth, pencil thin stream. Remove cap from the bottle, tilt, and place under stream. • Sampling equipment must be free of plastic tubing, gaskets, or other parts that may leach interfering analytes into the sample. • Fill the container with sample water. Mix for one minute until the sodium thiosulfate is completely dissolved. • Add sulfuric acid (H_2SO_4) to achieve a pH < 2. **See "Other Notes."**
Preservation	• Iced (4°C) • Store samples in the dark. (Very light sensitive)
	[SODIUM THIOSULFATE, H_2SO_4 PH<2, COOL 4C, DARK]
Analysis Time	Samples must be *extracted* by the lab within 7 days of collection. **Ship to DSHS lab only.**
Analytical Method	EPA 549.2
Analytes Measured	diquat, paraquat
Other Notes	H_2SO_4 is a STRONG ACID: **USE CAUTION!**

DISINFECTION BYPRODUCTS {DBP2}	
Submission Form	Mark form with analyte group "DBP2."
Special Note	• Collect four VOA vials. • Always collected in distribution. • Measure and record the chlorine residual, temperature, and pH. • Dechlorinating agents (crystalline or granular ammonium chloride or sodium thiosulfate) may be added to the sample containers prior to shipment to the field.
Container	Amber and clear glass VOA vials with Teflon (PTFE) lined screw-caps; 60 mL & 40 mL
	[2-60 ML AMBER GLASS & 2-40 ML CLEAR GLASS]
Head Space?	**NO** head space allowed
Procedure	• Label each bottle with a waterproof marker. • For method EPA 552.2 (HAA), add 6 mg ammonium chloride (NH_4Cl) to each empty amber glass vial to dechlorinate. **See "Other Notes."** • For method EPA 524.2 (THM), add 3 mg of sodium thiosulfate (or equivalent of a concentrated solution) to each empty clear glass vial to dechlorinate. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. Turn flow down to a smooth, pencil thin stream. Remove cap from the bottle, tilt, and place under stream. • Fill each bottle with sample water gently, till the meniscus is level with the bottle top. • Carefully place the cap on the bottle, eliminating any air. • Mix gently by hand for 1 minute. DO NOT SHAKE.
Preservation	• Iced (4°C) Store samples in the dark
	[AMMONIUM CHLORIDE/SODIUM THIOSULFATE, COOL 4C, DARK]
Analysis Time	Samples must be *extracted or analyzed* by the lab within 14 days of collection.
Analytical Methods	EPA 524.2 (TTHM), EPA 552.2 (HAA5)
Analytes Measured	chloroform, bromodichloromethane, bromoform, dibromochloromethane, monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, bromoacetic acid, dibromoacetic acid
Other Notes	If the chlorine residual is >5 mg/L, additional dechlorinating agent is required. For every 5 mg/L of chlorine above the initial 5 mg/L add an additional 6 mg of NH_4Cl or 3 mg of sodium thiosulfate. For example: a sample with 10 mg/L chlorine would require 12 mg (6+6)of NH_4Cl. Be careful not to add too much dechlorinating agent to the sample because this may cause interference with the analysis.

60 mL amber glass VOA vials used in the collection of HAA5 disinfection byproduct samples.

DRINKING WATER QUALITY {DWQ}	
Submission Form	Mark form with analyte group "DWQ."
Special Note	• Collect two bottles. • Measure and record the chlorine residual, temperature, and pH.
Container	Hard or soft plastic, or glass; 1 quart (1 L)
	[2-1 L PLASTIC OR GLASS]
Head Space?	Some head space is allowed
Procedure	• Label each bottle with a waterproof marker. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. • Turn flow down to a smooth, pencil thin stream. • Remove cap from the bottle, tilt, and place under stream.
Preservation	• Iced (4°C)
	[COOL 4C]
Analysis Time	Samples shall be shipped so that they will be received by the laboratory within 48 hours of collection. Holding times vary from 48 hours to 28 days depending on analyte but shipping is dependent on the shortest analysis time. pH and temperature are measured in the field. Ship to the designated lab only.
Analytical Methods	EPA 200.8, EPA 200.7, EPA 300.0, SM 2540C, SM 2320B, SM 2510B
Analytes Measured	alkalinity, calcium (Ca), chloride (Cl), conductivity, copper (Cu), hardness (calculated), iron, (Fe), lead (Pb), magnesium (Mg), manganese (Mn), orthophosphate, pH (field measured), silica (Si), sodium (Na), sulfate (SO_4), total dissolved solids (TDS), temperature (field measured)

EDB/DBCP {504}	
Submission Form	Mark form with analyte group "504."
Special Note	• Collect three (3) vials of sample. • Collect two (2) vials for a field blank. • Measure and record the chlorine residual, temperature, and pH.
Container	Glass vials with silicon/Teflon (PTFE) liners required; 40 mL
	[3-40 ML GLASS & FIELD BLANK]
Head Space?	Some head space is allowed
Procedure	• Label each bottle with a waterproof marker. • Add 3 mg sodium thiosulfate to each 40 mL vial to dechlorinate. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. Turn flow down to a smooth, pencil thin stream. Remove cap from the bottle, tilt, and place under stream. • Sampling equipment must be free of plastic tubing, gaskets or other parts that may leach interfering analytes into the sample. • Fill the container with sample water. Mix for one minute until the sodium thiosulfate is completely dissolved.
Preservation	• Iced (4°C) • Store samples away organic solvent vapors.
	[SODIUM THIOSULFATE, COOL 4C]
Analysis Time	Samples must be *analyzed* by the lab within 14 days of collection.
Analytical Method	EPA 504.1
QA/QC	Submit field blank with each sample.
Analytes Measured	ethylene dibromide (EDB), 1,2-dibromo-3-chloropropane (DBCP), 1,2,3-trichloropropane

ENDOTHALL [2033]	
Submission Form	Mark form with analyte code "2033."
Special Note	Measure and record the chlorine residual, temperature, and pH.
Container	Amber glass bottle with Teflon (PTFE) cap liner; 1 quart (1 L)
	[1 L AMBER GLASS]
Head Space?	Some head space is allowed.
Procedure	• Label each bottle with a waterproof marker. • Add 80 mg of sodium thiosulfate to the empty container to dechlorinate. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. Turn flow down to a smooth, pencil thin stream. Remove cap from the bottle, tilt, and place under stream. • Sampling equipment must be free of plastic tubing, gaskets or other parts that may leach interfering analytes into the sample. • Fill the container with sample water. Shake vigorously for one minute until the sodium thiosulfate is completely dissolved.
Preservation	• Iced (4°C) • Store samples away from light or heat.
	[SODIUM THIOSULFATE, COOL 4C, DARK]
Analytical Method	EPA 548.1
Analysis Time	Samples must be *extracted* by the lab within 7 days of collection. **Ship to DSHS LAB only.**

GLYPHOSPATE [2034]	
Submission Form	Mark form with analyte code "2034."
Special Note	• Collect one vial of drinking water and one vial of reagent water for a field blank • Measure and record the chlorine residual, temperature, and pH.
Container	Dark glass with Teflon (PTFE) cap liners; 60 mL
	[60 ML AMBER GLASS & FIELD BLANK]
Head Space?	Some head space is allowed.
Procedure	• Label each bottle with a waterproof marker. • Add 100 mg/L sodium thiosulfate to each container to dechlorinate (6 mg/60 mL vial) • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. Turn flow down to a smooth, pencil thin stream. Remove cap from the bottle, tilt, and place under stream. • Sampling equipment must be free of plastic tubing, gaskets or other parts that may leach interfering analytes into the sample. • Fill the container with sample water. Mix for one minute until the sodium thiosulfate is completely dissolved (if solid is used).
Preservation	• Iced (4°C) • Store samples away from light.
	[SODIUM THIOSULFATE, COOL 4C, DARK]
Analytical Method	EPA 547
Hold Time/Lab	Samples must be *analyzed* by the lab within 14 days of collection. **Ship to DSHS LAB only.**
Notes	Glyphosate is a broad-spectrum herbicide used to kill weeds, including broadleaf annuals and grasses. It is widely known by its trade name "Roundup" and is one of the most widely used herbicides.

HALOACETIC ACIDS [2456]	
Submission Form	Mark form with analyte code "2456."
Special Note	• Collect two VOA vials. • Always collected in distribution. • Measure and record the chlorine residual, temperature, and pH. • Crystalline or granular ammonium chloride should be added to the sample containers prior to shipment to the field.
Container	Amber glass VOA vials with Teflon (PTFE) lined screw-caps; 60 mL
	[2-60 ML AMBER GLASS]
Head Space?	**NO** head space allowed
Procedure	• Label each bottle with a waterproof marker. • Add 6 mg ammonium chloride (NH_4Cl) to an empty vial to dechlorinate. **(see "Other Notes")** • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. Turn flow down to a smooth, pencil thin stream. Remove cap from the bottle, tilt, and place under stream. • Fill the bottle with sample water gently, till the meniscus is level with the bottle top. • Carefully place the cap on the bottle, eliminating any air. • Mix gently by hand for 1 minute. DO NOT SHAKE.
Preservation	• Iced (4°C) • Store samples in the dark
	[AMMONIUM CHLORIDE, COOL 4C, DARK]
Hold Time	Samples must be *extracted* by the lab within 14 days of collection.
Analytical Method	EPA 552.2
Analytes Measured	monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, bromoacetic acid, dibromoacetic acid
Other Notes	If the chlorine residual is >5 mg/L, additional dechlorinating agent is required. For every 5 mg/L of chlorine above the initial 5 mg/L add an additional 6 mg of NH_4Cl. For example: a sample with 10 mg/L chlorine would require 12 mg (6+6)of NH_4Cl. Be careful not to add too much dechlorinating agent to the sample because this may cause interference in the analysis.

1-L plastic (HDPE) bottle. Used in the collection of metals, minerals and cyanide samples.

METALS {MTL1}	
Submission Form	Mark form with analyte group "MTL1."
Special Note	Measure and record the chlorine residual, temperature, and pH.
Container	Hard or soft plastic, or glass; 1 quart (1 L)
	[1 L PLASTIC OR GLASS]
Head Space?	Some head space is allowed
Procedure	• Label each bottle with a waterproof marker. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. Turn flow down to a smooth, pencil thin stream. Remove cap from the bottle, tilt, and place under stream.
Preservation	• No field preservation; Icing is **optional**
	[NO FIELD PRESERVATION]
Hold Time	Samples must be **received** by the lab within 14 days of collection.
Analytical Methods	EPA 200.8, EPA 200.7, EPA 245.1
Analytes Measured	Aluminum (Al), antimony (Sb), arsenic (As), barium (Ba)**.** beryllium (Be), cadmium (Cd), calcium (Ca), chromium (Cr), copper (Cu), iron (Fe), lead (Pb), magnesium (Mg), manganese (Mn), mercury (Hg), nickel (Ni), potassium (K), selenium (Se), silver (Ag), sodium (Na), total hardness, thallium (Tl), zinc (Zn)
Other Notes	Lead will be reported with this group.

MINERALS {MIN}	
Submission Form	• If chlorine residual is present (measured ≥ 0.2 mg/L), mark form with analyte group "MIN" and collect a single sample. • If chlorine residual is not present (measured < 0.2 mg/L), then mark form "MIN" and write "separate NO32 sample submitted" under Comments. Include the TCEQ ID of the additional sample; then fill out a separate PWS Water Analysis form marking "NO32" and collect a separate sample following the instructions under **Nitrate & Nitrite**.
Special Note	• Measure and record the chlorine residual, temperature, and pH.
Container	Hard or soft plastic, or glass; 1 quart (1 L)
	[1 L PLASTIC OR GLASS]
Head Space?	Some head space is allowed
Procedure	• Label each bottle with a waterproof marker. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. Turn flow down to a smooth, pencil thin stream. • Remove cap from the bottle, tilt, and place under stream.
Preservation	• Iced (4°C)
	[COOL 4C]
Hold Time	Samples shall be shipped so that they will be received by the laboratory within 48 hours of collection. Holding times vary from 48 hours to 28 days depending on analyte. pH is measured in the field.
Analytical Methods	EPA 150.1, EPA 300.0, EPA 353.2; SM 2320B, SM 2510B, SM 2540C, SM 4500 HB
Analytes Measured	alkalinity, bicarbonate (HCO_3), carbonate (CO_3), chloride (Cl), dil. conductance, fluoride (F), nitrate (NO_3), pH (field measured), sulfate (SO_4), TDS

NITRATE [1040]	
Submission Form	• Mark form with analyte code "1040." • If a chlorine residual is not present (measured < 0.2 mg/L) then the sample must be shipped overnight to the lab.
Special Note	Measure and record the chlorine residual, temperature, and pH.
Container	Hard or soft plastic, or glass; 100 mL
	[100 ML PLASTIC OR GLASS]
Head Space?	Some head space is allowed
Procedure	• Label each bottle with a waterproof marker. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. • Turn flow down to a smooth, pencil thin stream. • Remove cap from the bottle, tilt, and place under stream.
Preservation	• Iced (4°C)
	[COOL 4C]
Hold Time	Samples with chlorine residuals must be *analyzed* by the lab within 14 days of collection. Samples without chlorine residuals must be **analyzed** by the lab within 48 hours of collection.
Analytical Methods	EPA 300.0, EPA 353.2

NITRITE [1041]	
Submission Form	• Mark form with analyte code "1041." • Sample must be shipped overnight to the lab.
Special Note	Measure and record the chlorine residual, temperature, and pH.
Container	Hard or soft plastic, or glass; 100 mL
	[100 ML PLASTIC OR GLASS]
Head Space?	Some head space is allowed.
Procedure	• Label each bottle with a waterproof marker. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. • Turn flow down to a smooth, pencil thin stream. • Remove cap from the bottle, tilt, and place under stream.
Preservation	• Iced (4°C)
	[COOL 4C]
Analysis Time	Samples submitted for **nitrite (NO_2)** analysis must be analyzed by the lab within 48 hours **regardless** of chlorine residual.
Analytical Methods	EPA 300.0, EPA 353.2

NITRATE & NITRITE [NO32]	
Submission Form	• Mark form with analyte group "NO32." • If you are collecting a raw water sample or if a chlorine residual is not present (measured < 0.2 mg/L) during a routine sampling event, then you must ship the sample overnight to the lab.
Special Note	Measure and record the chlorine residual, temperature, and pH.
Container	Hard or soft plastic, or glass; 100 mL
	[100 ML PLASTIC OR GLASS]
Head Space?	Some head space is allowed
Procedure	• Label each bottle with a waterproof marker. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. • Turn flow down to a smooth, pencil thin stream. • Remove cap from the bottle, tilt, and place under stream.
Preservation	• Iced (4°C) • No other field preservation is required other than to immediately place the sample on ice in order to maintain 4°C during the entire handling and shipping process.
	[COOL 4C]
Analysis Time	Samples without chlorine residuals must be **analyzed** by the lab within 48 hours of collection. Samples submitted for **nitrite (NO_2)** analysis must be analyzed by the lab within 48 hours **regardless** of chlorine residual.
Analytical Methods	EPA 300.0, EPA 353.2
Other Notes	Ship the samples via overnight delivery so that they are received by the lab within 24 hours of collection.

120 mL hard plastic (HDPE) bottle. Used in the collection of nitrate and nitrite samples.

PCBs [2383]	
Submission Form	Mark form with analyte code "2383."
Special Note	• Collect triplicate (3) samples. • Measure and record the chlorine residual, temperature, and pH.
Container	Narrow-mouth amber glass bottle with Teflon (PTFE) cap liner; 1 quart (1 L)
	[1 L AMBER GLASS]
Head Space?	A small amount of head space is allowed.
Procedure	• Label each bottle with a waterproof marker. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. Turn flow down to a smooth, pencil thin stream. • Remove cap from the bottle, tilt, and place under stream. • Fill bottles to 90-95% full.
Preservation	• Iced (4°C)
	[COOL 4C]
Analysis Time	Samples must be *extracted* by the lab within 14 days of collection. Ship to DSHS LAB only.
Analytical Method	EPA 508A
Analytes Measured	PCBs
Other Notes	This sample is collected as a confirmation when an aroclor is detected by screening method 508.1.

RADIOCHEMICALS {RAD}	
Submission Form	Mark form with analyte group "RAD."
Special Note	• These samples are collected from the entry point as a single "grab" sample as contrasted with a temporal composite sample. • Measure and record the chlorine residual, temperature, and pH.
Container	Hard or soft plastic, or glass; 1 gallon + 1 liter
	[1 GAL + 1 L PLASTIC OR GLASS]
Head Space?	Some head space is allowed.
Procedure	• Label each bottle with a waterproof marker. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. • Turn flow down to a smooth, pencil thin stream. • Remove cap from the bottle, tilt, and place under stream.
Preservation	• No field preservation; Icing is *optional*
	[NO FIELD PRESERVATION]
Analysis Time	Samples must be **received** by the lab within 5 days of collection. Ship to DSHS LAB only.
Analytical Methods	EPA 200.8, EPA 900.0, SM 7500-RAD, SM 7500-RAC, SM 7500-UC
Analytes Measured	gross alpha, gross beta, radium 228, uranium mass, radium 226
Other Notes	The analysis of radionuclide samples is a multi-stage process that can take as long as two months to complete. All radiochemical samples are analyzed for gross alpha (4002), gross beta (4100), radium 228 (4030) and uranium mass. The gross alpha analysis can take up to 15 hours to complete. The gross beta analysis takes up to 8 hours to complete. If the combined gross alpha and radium 228 radioactivity exceeds 5 pCi/L, then radium 226 is also analyzed. If gross beta radioactivity exceeds 50 pCi/L, then the Beta radiochemicals group is scheduled for collection and analysis.

REVISED TOTAL COLIFORM RULE {RTCR}	
Submission Form	Mark form with analyte group "RTCR."
Special Note	• Measure and record the chlorine residual, temperature, and pH.
Container	Sterile 125 mL plastic with sodium thiosulfate to dechlorinate
	[125 ML PLASTIC]
Head Space?	Some head space is allowed.
Procedure	• Label each bottle with a waterproof marker. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. • Measure and record temperature, pH and residual • Sterilize the tap with flame or bleach. • Turn flow down to a smooth, pencil thin stream. • Remove cap from the bottle, tilt, and place under stream. Fill to the bottle's neck. Replace cap and place in cooler for shipping.
Preservation	• Iced (4°C)
	[SODIUM THIOSULFATE, COOL 4C]
Analysis Time	Samples must be placed in laboratory incubator within 30 hours of sample collection.
Analytical Methods	SM9223B [Colilert / Colilert-18]
Analytes Measured	Total coliform, *E. coli*
Other Notes	Aseptic technique is critical to avoid contamination of the sample. Wear disposable gloves or ensure hands are thoroughly washed before sample collection. Bottles *may* be available from the laboratory. Shipping must always be overnight to ensure hold times are met.

1 gallon soft plastic container used in the collection of radiochemical samples.

SECONDARIES {SEC1}	
Submission Form	Mark form with analyte group "SEC1."
Special Note	• Collect two bottles. • Measure and record the chlorine residual, temperature, and pH.
Container	Hard or soft plastic, or glass; 1 quart (1 L)
	[2-1 L PLASTIC OR GLASS]
Head Space?	Some head space is allowed.
Procedure	• Label each bottle with a waterproof marker. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. • Turn flow down to a smooth, pencil thin stream. • Remove cap from the bottle, tilt, and place under stream.
Preservation	• Iced (4°C)
	[COOL 4C]
Analysis Time	Samples shall be shipped so that they will be received by the laboratory within 48 hours of collection. Holding times vary from 7 to 28 days depending on analyte. pH is measured in the field.
Analytical Methods	EPA 200.8, EPA 200.7, EPA 300.0, SM 2540C
Analytes Measured	aluminum (Al), chloride (Cl), copper (Cu), fluoride (F), iron (Fe), manganese (Mn), pH (field measured), silver (Ag), sulfate (SO_4), TDS, zinc (Zn)

1-L amber glass bottle used in the collection of synthetic organic chemical samples.

SYNTHETIC ORGANICS GROUP 5 {SOC5}	
Submission Form	Mark form with analyte group "SOC5."
Special Note	Measure and record the chlorine residual, temperature, and pH.
Container	Narrow-mouth (or wide mouth) amber glass with Teflon (PTFE) cap liner; 1 quart (1 L)
	[1 L AMBER GLASS] [1]
Head Space?	A small amount of head space is allowed.
Procedure	• Label each bottle with a waterproof marker. • Add 50 mg of sodium sulfite (Na_2SO_3) to the empty container to dechlorinating agent. [2] • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. Turn flow down to a smooth, pencil thin stream. • Remove cap from the bottle, tilt, and place under stream. • Sampling equipment must be free of plastic tubing, gaskets or other parts that may leach interfering analytes into the sample. • Fill half the container with sample water. Mix gently until sodium sulfite is completely dissolved. • Add 3 to 4 mL 6N HCl in order to achieve a pH of < 2. (HCl is used as a preservative) [3] • Finish filling the container (to shoulder) and seal. A small amount of head space is acceptable. • Mix for one minute.
Preservation	• Iced (4°C) • Store samples in the dark from time of collection until extraction. • **Don't measure the pH in the sample bottle! Verify the amount of preservative to achieve proper pH for each sample in a separate container**.
	[SODIUM SULFITE, HCL PH<2, COOL 4C, DARK]
Analysis Time	Samples must be *extracted* and analyzed by the lab within 14 days of collection.
Analytical Method	EPA 525.2, EPA 508.1
Analytes Measured	alachlor, aldrin,atrazine,benzo(a)pyrene, butachlor, chlordane, DEHA, DEHP, dieldrin, endrin, heptachlor, heptachlor epoxide, hexachlorobenzene, hexachlorocyclopentadiene, lindane, metolachlor, methoxychlor, metribuzin, PCBs (aroclors), propachlor, simazine, toxaphene
Other Notes	[1] Laboratory QC duplicates are required for SOC Group 5 samples. One in ten samples shall be collected in triplicate. For the sample to be triplicated, add the words "+DUP" on the top of the PWS Water Analysis form and inside the SOC5 box at the bottom of the form. Label the duplicate sample bottles with "DUP". The sample and duplicates will be submitted with the one PWS Water Analysis form. [2] If the chlorine residual is >5 mg/L, additional dechlorinating agent is required. For every mg/L of chlorine above the initial 5 mg/L add an additional 10 mg of Na_2SO_3. For example: a sample with 7 mg/L chlorine would require 70 mg of Na_2SO_3. Be careful not to add too much Na_2SO_3 to the sample because this may cause interference in the analysis. [3] If you must collect a confirmation sample for prometon, you will NOT add the acid. Make sure that the submission form is labeled well stating "PROMETON, NO ACID."

SYNTHETIC ORGANIC CHEMICALS—EPA Method 515.4{515}	
Submission Form	Mark form with analyte group "515."
Special Note	Measure and record the chlorine residual, temperature, and pH.
Container	Amber glass bottle with Teflon (PTFE) cap liner; 40 mL
	[2-40 ML AMBER GLASS]
Head Space?	A small amount of head space is allowed.
Procedure	• Label each bottle with a waterproof marker. • Add 2 mg of sodium sulfite (Na_2SO_3) to the empty container to dechlorinate.[1] • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. When sampling from a water tap, **remove the aerator** so that no bubbles will be trapped in the sample. • Turn flow down to a smooth, pencil thin stream. • Remove cap from the bottle, tilt, and place under stream. • Fill the container with water taking care not to flush out the sodium sulfite and seal. • Mix by repeatedly inverting for 15 seconds. DO NOT SHAKE. • *Duplicates are required; collect one duplicate for every ten samples.*
Preservation	• Iced (10°C). DO NOT FREEZE. • Store samples in the dark.
	[SODIUM SULFITE, COOL 10C, DARK]
Analysis Time	Samples must be *extracted* by the lab within 14 days of collection.
Analysis Method	EPA 515.4 (chlorophenoxy herbicides)
Analytes Measured	2,4,5-TP, 2,4-D, dalapon, dinoseb, pentachlorophenol, picloram; several unregulated analytes

SYNTHETIC ORGANIC CHEMICALS—EPA Method 531.1{531}	
Submission Form	Mark form with analyte group "531."
Special Note	• Collect two (2) vials of drinking water. • Measure and record the chlorine residual, temperature, and pH.
Container	Glass VOA vials with Teflon (PTFE) lined screw-caps; 60 mL
	[2-60 ML GLASS]
Head Space?	A small amount of head space is allowed
Procedure	• Label each vial with a waterproof marker. • Add 1.8 mL of monochloroacetic acid buffer* to each empty vial. • Add 5 mg of sodium thiosulfate (or an equivalent of freshly prepared sodium thiosulfate solution) to each of the empty vials (to dechlorinate). • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. • Turn flow down to a smooth, pencil thin stream. • Remove cap from the vial, tilt, and place under stream. • Fill the vials with water and seal. • Shake vigorously for 1 minute.
Preservation	• Iced (4°C) • Sodium thiosulfate, MCA pH <3
	[SODIUM THIOSULFATE, MCA PH<3, COOL 4C]
Analysis Time	Samples must be *received* by the lab within 7 days of collection and *analyzed* by the lab within 28 days of collection.
Analytical Method	EPA 531.1 Carbamate Insecticides
QA/QC	Duplicates are required; collect one duplicate for every ten samples.
Analytes Measured	aldicarb, aldicarb sulfone, aldicarb sulfoxide, carbofuran, oxamyl, several unregulated analytes
Other Notes	* Prepare by mixing 156 mL of 2.5 M monochloroacetic acid and 100 mL 2.5 M potassium acetate.

TRIHALOMETHANES [2950]	
Submission Form	Mark form with analyte code "2950."
Special Note	• Collect two VOA vials. • Always collected in distribution. • Measure and record the chlorine residual, temperature, and pH. • Ammonium chloride/phosphate buffer should be added to the sample containers prior to shipment to the field.
Container	Clear glass VOA vials with Teflon (PTFE) lined screw-caps; 40 mL
	[2-40 ML CLEAR GLASS]
Head Space?	**NO** head space allowed.
Procedure	• Label each bottle with a waterproof marker. • Add 3 mg of sodium thiosulfate (or equivalent of a concentrated solution) to each empty clear glass vial to dechlorinate. • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. • Turn flow down to a smooth, pencil thin stream. • Remove cap from the bottle, tilt, and place under stream. • Fill the bottle with sample water gently, till the meniscus is level with the bottle top. • Carefully place the cap on the bottle, eliminating any air. • Mix gently by hand for 1 minute. DO NOT SHAKE.
Preservation	• Iced (4°C) • Store samples in the dark • 3 mg sodium thiosulfate
	[SODIUM THIOSULFATE, COOL 4C]
Hold Time	Samples must be *analyzed* by the lab within 14 days of collection.
Analytical Method	EPA 524.2
Analytes Measured	chloroform, bromodichloromethane, bromoform, dibromochloromethane
Other Notes	If the chlorine residual is >5 mg/L, additional buffer/dechlorinating agent is required. For every 5 mg/L of chlorine above the initial 5 mg/L add an additional 3 mg of sodium thiosulfate dechlorinating agent. For example: a sample with 10 mg/L chlorine would require 6 mg of sodium thiosulfate.

40 mL glass VOA vials used in the collection of synthetic VOC and trihalomethane samples.

VOLATILE ORGANICS {VOC}	
Submission Form	Mark form with analyte group "VOC."
Special Note	• Collect two vials of drinking water[1] and two vials of reagent water for a field blank with every sample. • Measure and record the chlorine residual, temperature, and pH.
Container	Glass screw-top VOA vial equipped with a Teflon (PTFE) faced silicone septum; 40 Ml. [2-40 ML GLASS & FIELD BLANK]
Head Space?	**NO** head space allowed.
Procedure	• Affix pre-printed sample labels to vials. DO NOT write on labels until after all samples are collected and vials are sealed. • Add 25 mg of ascorbic acid to an empty vial to dechlorinate. [2] • **Adding preservative to sample vials prior to sample collection is NOT permitted.** • Open the tap and allow the system to flush until the water temperature stabilizes, at least 5 minutes. Turn flow down to a smooth, pencil thin stream. Remove cap from the bottle, tilt, and place under stream. • Fill the vial half full. DO NOT SHAKE. • Add sufficient 6N HCl in order to achieve a pH of < 2. • Complete filling the vial and seal. • Mix gently for one minute. DO NOT SHAKE. • Be sure each bottle is labeled with a waterproof marker.
Preservation	• Iced (4°C) • Store samples away from any organic solvent vapors and avoid direct sunlight or intense light. • Preserve with 6N HCL to pH < 2. [ASCORBIC ACID, HCL pH<2, COOL 4C]
Hold Time	Samples must be *analyzed* by the lab within 14 days of collection.
Analytical Method	EPA 524.2
QA/QC	**Collecting Field Blanks:** A field blank consisting of two vials is required when collecting all VOC samples to rule out air contamination. Treat the field blank in the same manner as the water sample. The field blank is collected at the same location and time that the water sample is collected. • Add ascorbic acid to each empty vial. • Add laboratory grade reagent water instead of sample water. Once the container of laboratory reagent water is opened for this field blank, it can't be used again. • Add HCl to a pH <2. • Complete filling the vials and seal. • Mix for one minute. Invert the bottle repeatedly but DO NOT SHAKE. Label the containers to indicate that it is a field blank ("FB" or "Field Blank").
Analytes Measured	See Appendix A
Other Notes	Don't measure the pH in the sample bottle! Verify the amount of preservative to achieve proper pH for each sample in a separate container. [1] Avoid collecting this type of sample in any situation where you can smell petroleum or solvent type fumes. [2] If the chlorine residual is >5 mg/L, additional dechlorinating agent is required. For every mg/L of chlorine above the initial 5 mg/L add an additional 5 mg of ascorbic acid. For example: a sample with 7 mg/L chlorine would require 35 mg (25 + 5 + 5) of ascorbic acid. Be careful not to add too much dechlorinating agent to the sample because this may cause interference in the analysis.

Headspace

Make sure to follow sample collection guidelines with regard to head space. Some samples must be collected without any head space (no air or bubbles). Other samples are allowed a small amount of head space. Fill those containers to the neck. The head space requirement for different analytes is noted in the Water Sample Collection Procedures (see Table 9.1).

To collect a sample with "no head-space," fill the bottle until the meniscus is just over the bottle top, but not until the water overflows. Gently place the lid on, displacing just a little water, and screw it on. Check the bottle by turning it upside down and looking for bubbles after you screw on the lid. There shall be no bubbles.

Table 9.2. Special Notes and Precautions for Sampling

Chemical Odors	Avoid collecting VOC samples in locations with petroleum or solvent-type fumes. These can CONTAMINATE the sample. If sample collection under these conditions is unavoidable, make a note in the COMMENTS field.
Hose Bibb	Remove any hoses from the sample tap before flushing. Collect the sample directly from the tap or bibb. This is especially important for SOC5 organic samples.
Flush Tap	Before collecting a sample, let the water flow until it changes temperature, or until you detect chlorine residual (at least 5 minutes). NEVER sample from the first draw water.
Measure and Record Chlorine Residual	Measure the chlorine residual at each sample site (including wells) and record. Let the DPD react fully before measuring. Use manufacturer's guidelines. Remember to rinse the colorimeter vial thoroughly between samples. Completely flush before measuring the chlorine residual.
High Chlorine Residuals	High chlorine residual may bleach the DPD reagent and give a false zero reading. Use the manufacturer's guidelines for "HIGH LEVEL" readings. Measuring high chlorine residuals may require dilution.
Chemicals	Check expiration dates. Never use expired chemicals; dispose of them properly. Do not store chemicals for a prolonged period of time in excessive heat.
Preservation	Preserve the sample according to instructions. USE CAUTION WITH STRONG ACIDS OR BASES. THESE CHEMICALS CAN CAUSE BURNS.
Adjust pH	Don't measure pH in the sample bottle! Verify the amount of preservative to achieve proper pH for each sample in a separate container. Always remember to rinse your pH probe with distilled or deionized water.
Sample Collection	Follow directions precisely. Each collection procedure is different. Using the wrong collection method could severely compromise the analytical accuracy. Let the water flow in a pencil-thin stream. Tilt the bottle and move it under the flowing stream, letting the water flow smoothly down the side, without producing bubbles. Do not overflow the bottle because this can wash out preservatives. Never add preservatives to containers prior to sample collection unless specifically allowed in the procedure.
Label Bottle	Label each bottle with TCEQ ID, sample source, type, and your printed initials. Use a water proof marker. Pre-printing labels is acceptable. Use caution with "Sharpie" type pens when labeling VOC containers; they may contaminate the samples with acetone if used before the water sample is collected and sealed.
Head Space	Some samples must be collected with "no head-space." Fill the bottle until the meniscus is just over the bottle top, but not until the water overflows. Gently place the lid on, displacing just a little water, and screw it on. After you screw on the lid, check the bottle by turning it upside down and looking for bubbles. There shall be no bubbles.
PWS Water Analysis Form	Make sure the form (or electronic equivalent) is filled out completely and accurately. Incomplete or inaccurate forms will be rejected by the laboratory.
Shipping	Make sure you use adequate ice, especially in the summer. Place forms in a zip-lock type bag and close it carefully. An electronic substitute for the PWS Water Analysis Form may be used with TCEQ approval.
Check Your Work!	Double check all forms (or data) and containers for accuracy before shipping to the laboratories. An extra 5-10 minutes of effort can prevent the rejection of a sample, or even an entire shipment of samples, because of paperwork mistakes.

Section 10—Forms and Instructions

It is very important that the correct paperwork track the sample. This is a key element in ensuring quality. No matter how carefully a sample is collected, if it is not clear where or what the sample was collected for, the sample is valueless. The EPA has strict guidelines for quality control and assurance, so it is important that the data on the PWS Water Analysis Form (or electronic equivalent) is complete and accurate.

NOTE	The PWS Water Analysis Form must be correctly and completely filled out, or the laboratory is required to reject the sample. Each separate sample must be accompanied by its own paper PWS Water Analysis Form. When using an electronic tablet collection method, multiple samples may be included on a single Sample Collection Analysis Report (SCAR).

The submission form and COC form are legal documents. These forms shall be completed carefully and clearly. Forging a PWS official's signature or intentionally providing false information on these forms is a violation of state and federal law (felony) and can result in substantial fines and/or imprisonment. Samplers may make corrections to the submission form by drawing a single line through the mistake and initialing, dating, and then writing in the corrected information.

The submission form is defined as the PWS Water Analysis Form or a TCEQ approved equivalent (including electronic) that captures all mandatory data listed below.

In no case shall changes be made after the PWS representative has signed the form unless the TCEQ has been consulted and grants permission; under these circumstances, all copies must be corrected identically.

PWS Water Analysis Form

Whenever possible, samplers shall utilize the PWS Water Analysis Form with pre-printed sample data. However, in the event one must complete a blank PWS Water Analysis form in the field, please ensure that all fields are complete and accurate. If the PWS Water Analysis Form is utilized, then each sample must be accompanied by a separate form. Table 10.1 provides instructions on filling out the PWS Water Analysis Form.

"TCEQ Pay" Samples

The TCEQ may occasionally request special samples to be collected for which the lab analysis fees will be paid through a contract or purchase order with a specific laboratory. Write "TCEQ" in the Bill To and Report To sections of the PWS Water Analysis Form All TCEQ Pay samples must be shipped to the contracted laboratory for analysis (DSHS).

Mandatory Data Fields

The following fields on the submission form (or electronic equivalent) must be filled in and correct, or the sample will be rejected by the laboratory or TCEQ:

- PWS ID#
- TCEQ ID#
- Date & time collected
- Facility ID, facility location, sample point, sample location, latitude and longitude

- Sampling technician’s signature
- PWS Representative’s signature
- Analysis type
- Chlorine residual
- pH and temperature
- GPS coordinates (TCEQ will reject if missing or incorrect)

Public Water System Water Analysis

TCEQ SAMPLE ID #:

BILL TO:

Name

Address 1

Address 2

City, State, Zip Code

REPORT TO:

Name

Address 1

Address 2

City, State, Zip Code

WATER SYSTEM ID #: _____

DATE/TIME COLLECTED: Month Day Year : Military Time

SAMPLE TYPE: [ ] Routine [ ] Confirmation [ ] Field Blank [ ] Special

PRIORITY: [ ] Normal [ ] 2 Week [ ] 1 Week [ ] 48 Hour [ ] 24 Hour

COMPLIANCE (Y/N): _____

SAMPLING LOCATION

FACILITY ID:

FACILITY LOCATION:

SAMPLE POINT:

SAMPLE LOCATION:

LAT: N LONG: W -

Water analyses are required by law (30 TAC §290, THSC §341.0315). I acknowledge that the sampling technician has been accompanied during sampling and that the sample has been collected from the correct location indicated on this form. Water systems are responsible for all laboratory fees. Falsification of this form or tampering with water samples is a crime punishable under state and federal law. Refusing to sample, including refusing to sign this form, will result in a monitoring and reporting violation(s), possible enforcement, and fines.

FREE CHLORINE RESIDUAL: . mg/L

TOTAL CHLORINE RESIDUAL: . mg/L

TAP FLUSHING: : START : END

TEMPERATURE: ° F **pH:** .

Signature (Water System Representative)

Print Name - ALL CAPS (Water System Representative)

Signature (Sampling Technician)

Print Name - ALL CAPS (Sampling Technician)

SAMPLE ANALYSIS INFORMATION

Analysis Type:

Container:

Preservation:

RECOLLECTION INFORMATION

Original Lab ID:

Original Collection Date:

FOR MORE INFORMATION:

Public water systems may view their water system information including sampling schedules and sample results by visiting the State of Texas Drinking Water Watch website at the following address:

http://dww.tceq.texas.gov/DWW/

Regulations governing sample scheduling and collection are available upon request from the Public Drinking Water Section of the Texas Commission on Environmental Quality.

Phone: (512) 239-4691

Email: PDWS@tceq.texas.gov • Website: http://www.tceq.texas.gov

COMMENTS:

LABORATORY USE ONLY

LAB NAME:

LAB CERTIFICATION ID#:

LAB SAMPLE ID #:

DATE RECEIVED:

DATE REPORTED:

PWS Water Analysis Form Instructions

Table 10.1. Instructions for Fields on the PWS Water Analysis Form

FIELD	INSTRUCTIONS
TCEQ ID #	Unique sample ID number assigned to every sample on the yearly sample schedule.
Water System ID #	PWS identification number; preceded by "TX".
Date/Time Collected	Use military time (hours and minutes) and month, day and year. Record the time immediately after the sample collection procedure is completed. Record exact times, do not estimate or round times.
Sample Type	**Routine (RT)—**Almost all samples are routine unless they fall into the other categories below.
	Confirmation (CO) - A sample ordered to confirm a previous sample result.
	Field Blank (FB)—A non-standard field blank; use for samples that do not normally include a field blank, but for which a field blank has been requested.
	Special (SP)—Special study samples or complaint follow up samples; generally, not for compliance.
Priority	Indicate sample priority: normal (N), 1 week (1WK), 2 week (2WK), 48 hour (48H), or 24 hour (24H).
Compliance	Indicate whether or not sample is for compliance (Y/N).
Sampling Location	**Facility ID—**EP, well code or DS01 for distribution.
	Facility Location—Location (address) of EP; PWS designation for wells.
	Sample Point—TRT- TAP (EPs), RAW-TAP (wells), or distribution sample point (i.e. DBP1-01 or ASB-01).
	Sample Location—Sample tap location (EPs), well head or distribution address.
	Latitude/Longitude—GPS location of sample collection site. Use decimal degrees, six decimal places.
Chlorine Residual	Required for **ALL** samples. Measure the residual after flushing is completed. Complete section corresponding to the type of measurement used; either free or total chlorine. Both may be measured if unsure about residual type in use.
Tap Flushing	Record the time flushing begins and the time flushing ends. Entry points shall be flushed for at least 5 minutes, wells shall be flushed for a minimum of 15-30 minutes depending on depth. Record exact times, do not estimate or round times.
Temperature	Measure the temperature of the water after flushing is completed. Record the temperature in degrees Fahrenheit as a whole number, **no decimals**.
pH	Measure and record pH if required. Mandatory for MIN and SEC samples.
Signature of Sampler	Sampler's signature (with printed name underneath). Signature is mandatory.
Signature of Water System Official	Water System Representative's signature. The name shall be printed underneath the signature. If the signature is missing, the sample will be rejected.
Report To	The address of the Administrative Contact for the PWS. For special samples this usually has the TCEQ Region office number.
Bill To	Typically, the PWS. Special samples are billed to the TCEQ
Recollection Information	If the sample is a recollection for a previously rejected sample, write in the original laboratory ID (not TCEQ ID) and the original collection date.
Comments	General comments relating to the sample collection.
Sample Analysis Information	**Analysis type—**Write or print the desired analyte code or group. See **Appendix C**.
	Container—Write or print the container type used to collect the sample; see individual sample collection instructions in **Section 9** of the DWSG.
	Preservation—Write or print the preservation used; see individual sample collection instructions in **Section 9** of the DWSG.

NOTE	**Always print clearly**; just because you can read your handwriting does not mean everyone else can. Take the time to print legibly and make sure spelling is correct.

Field Reports

The TCEQ values the information provided by the sampler through field reports. Field report information can be used to develop enforcement cases and evaluate PWSs for reduced sampling. A field report is filled out whenever

- the sampler finds data provided by the TCEQ is inaccurate,
- a PWS refuses to sample,
- there is a major DBP site change,
- the PWS cannot be contacted to arrange sampling, or
- a sampling site is unsuitable or unavailable.

Complete and accurate information is required on the field report in order for appropriate follow-up action to occur. Provide as much detail as possible on the form.

When submitting a Field Report for no returned calls (NRC), the sampler must document **at least three** contact attempts. Include the date and time of each call, the phone number, and whether or not a message was left. If you leave a message, indicate whether it was an answering machine or to a person. If the message was left with a person, include their name and relationship to the PWS.

When submitting a field report for a bad contact (BC), the sampler must make a reasonable effort to find correct phone numbers, such as referring to DWW. The action taken to find correct information must be documented on the field report.

The following pages contain an example Field Report Form and instructions for completing the form. A printed copy shall also be made and submitted with the monthly invoices, as well as a cumulative table containing the field report data.

PWS _ _ CO _ _ Field Report

TCEQ Drinking Water Compliance Sampling
FIELD REPORT

PWS Name:		PWS ID:
FR Code (See reverse):		
Submitted by:		Date of Event:
DWW Checked? [ ] Y [ ] N	Samples Collected? [ ] Y [ ] N	Notify of Outcome? [ ] Y [ ] N

System Contact Information

Name:	Title:	Type*:
Address:		
Phone:	Email:	

* RP-Responsible Official, PWS-Primary PWS Contact, CC-Chemical Sampling Contact, O-Other

Samples Affected

TCEQ ID	Facility ID	Sample Point	Sample Period	Sample Type

Comments

TCEQ USE ONLY	
Processed by:	Rescheduled by:
Date:	Date:

TCEQ Drinking Water Compliance Sampling

FIELD REPORT INSTRUCTIONS

General Information:

PWS Name/PWS ID – Fill in both the public water system name and ID number

FR Code – Fill in a code from the table below

Submitted by – Fill in the name of the individual submitting the report

Date of Event – Date the event occurred that required a field report

DWW Checked? (Y/N) – Indicate whether or not Drinking Water Watch was checked for information

Samples Collected? (Y/N) – Indicate whether or not samples were collected

Notify of Outcome? (Y/N) – Check Y if you want TCEQ to follow up with you regarding the outcome of the field report

System Contact Information:

Name - Fill in the name of the PWS contact, their title and type of contact

Contact Information – Fill in the address, phone number and email address of the PWS representative contacted

Samples Affected:

List each sample affected by the reason behind the field report. Include TCEQ ID, Facility ID, Sample Point, Sample Period, and Sample Type. If more than 6 samples are affected, complete additional forms.

Comments:

Describe in detail the reason for the field report. Include sufficient information for TCEQ to properly follow up on the situation.

NRC	No Returned Call – Use after a minimum of 3 unsuccessful contact attempts. Include date/time, phone number, name of person and messages left.
BC	Bad Contact – Use after all avenues are exhausted to find a correct contact. Must verify DWW before using this code. Include the phone numbers that were attempted.
CHG	Change Information – Contact information for PWS has changed. Include the new information in the comments and a PWS phone number to verify.
RS	Refused Sampling – Use only when a PWS expressly refuses to allow sampling. Must include name and phone number of individual who refused.
SEAS	Seasonal – Entire PWS is shut down for the sampling period. Include normal operating period.
IN	Inactive – PWS indicates they are no longer active.
MP	Merged PWS – PWS merged with another PWS and is no longer required to sample.
NEW	New Well or Entry Point – PWS indicates they have a new well or entry point.
E	Emergency – PWS indicates sample site is for emergency use only. Include how often the site is used.
PUR	Purchased – PWS indicates only purchased water at entry point. Does not apply to nitrate/nitrite samples.
ME	Merged Entry Point – PWS indicates entry point flows to another existing entry point.
TOL	Temporarily Off Line – EP or well is temporarily off line. Include estimated date that facility will be available for sampling. Only submit this after multiple attempts have been made to collect samples during a sample period, and the period has ended.
DNE	Does Not Exist – PWS indicates the EP, well or sample site does not exist
Other	Other – only use this code if none of the above apply. Include detailed information.

Chain of Custody

A COC is required for all samples. A COC must be used to document all samples sent to the laboratory and must accompany those samples to the laboratory. A COC is also used for complaint samples or spill-response samples that are collected by TCEQ regional field investigators.

Procedures for COCs require maintenance of permanent records for all sample handling and shipment. COC procedures must be used to ensure sample integrity as well as legally and technically defensible data.

Depending on the number of samples in an ice chest, more than one COC may be necessary. The COC must have all analysis requests listed with their collection dates and times. All samples in the ice chest must be included on the COC(s). Items listed on the COC as **mandatory** must be completed or the associated sample(s) will be rejected by the laboratory.

All samples must be kept under personal supervision or locked in storage until custody is relinquished to the shipper and formal documentation of the transfer is completed. The sample collector starts the COC procedure. If an ice chest contains samples collected by multiple samplers, each sampler must complete a separate COC for his or her samples. If an individual other than the sampler is responsible for shipping the samples, they must also sign the COC, documenting the transfer of responsibility.

When completing the form, make sure all of the required information is correct and legibly written. Fill in the form with a black waterproof ink pen. The use of a fine point pen is discouraged because of possible problems in making legible photocopies.

The COC form must be signed when the shipment is released to the shipper. The shipper is not required to sign the form. When the shipment is received by the laboratory, the laboratory will sign the form.

If any error is made on the COC form, the error must be corrected by drawing a single line through the mistake and initialing, dating, and then writing in the corrected information.

Custody Seals

The ice chest must be sealed to prevent tampering. Any evidence of tampering should be readily detected if adequate sealing devices are used. Custody seals are mandatory. If custody seals are missing, broken, or tampered with, samples must be rejected. See **Section 8** for additional information on shipping samples.

CHAIN-OF-CUSTODY RECORD

Public Drinking Water Sample Analyses

LAB USE ONLY

Lab Name:

Lab Certification ID #:

Project Manager:

TCEQ ID#	Date MM/DD/YY	Military Time	PWS ID#	# of containers	Analysis Required	Chlorine Residual	pH	Comments	Received?	Lab Sample ID #
			TX							
			TX							
			TX							
			TX							
			TX							
			TX							
			TX							
			TX							
			TX							
			TX							
			TX							
			TX							
			TX							
			TX							

General Comments:

Sample Condition as Received:

	Date	Time	Relinquished by: (sampler)			Sampler Phone #:
	Date	Time	Received/Relinquished by:			Sampler Name: (please print clearly)
	Date	Time	Received by: (laboratory)			Sampler Signature:
Shipper Name:		Shipper Number:				

On Ice? Y N _____°C

Sealed? Y N

General Lab Comments:

Table 10.3. COC Form Instructions

FIELD	Description	Mandatory?*
Sampler telephone #	Sampler's phone number	No
Project Manager email address	The e-mail address of the sampler's project manager	No
Sampler (signature)	The signature of the sampler	**YES**
Sampler Name	The sampler's printed name	No
TCEQ ID #	TCEQ Sample ID number	**YES**
Date	Date collected	**YES**
Time	Time collected, reported in military time	**YES**
# of containers	# of sample containers	**YES**
Grab/Comp	Check to indicate a grab or composite sample	No
PWS ID #	Public Water System ID number	**YES**
Analysis Required	The type of analysis requested	**YES**
Remarks	Notes or comments regarding the sample	No
Relinquished/Received By	Date, time and signature of persons relinquishing or receiving shipment	**YES**

*If mandatory fields are left blank or filled out incorrectly, the sample(s) will be rejected.

Section 11—Field Measurements

Certain parameters must be measured while in the field at the sample site. All field measurements must be completed by the sampler using his or her own equipment. Only record measurements you make yourself. **Never use field measurements obtained from PWS personnel or instruments.** All QC must be documented and available for inspection.

All field instruments must be calibrated and operated according to the manufacturer's instructions prior to field use. The operation of field equipment varies depending on the manufacturer. Care must be taken to assure that each instrument is functioning properly. Instruments MUST utilize EPA-approved analytical methods for drinking water.

The contractor's water sampling program or QA manager is responsible for insuring that all field personnel are trained to conduct field measurements and sampling activities at appropriate locations and times using consistent and uniform methods.

Chlorine Residual

Instruments used to measure chlorine residuals must have a minimum accuracy of ±0.1 mg/L and utilize an EPA approved drinking water method.

For each sample, measure and record the chlorine residual at each sample site (including wells). Let the diethyl-p-phenylene diamine (DPD) react fully before measuring.

Remember to rinse the colorimeter vials thoroughly between samples.

Be sure that the sample cells (vials) and the holder are free of moisture and dust; if not, wipe dry with a soft, lint-free tissue. Sample cells shall be checked for bubbles and/or condensation before blanking and measurement since these conditions can affect accuracy.

When using a hand-held colorimetric chlorine analyzer, a sample may need to be measured using the high-level method. It is very easy to get a false reading of zero when the chlorine residual is extremely high. The chlorine can actually bleach the DPD reagent past the red point. If this happens, you will see a very brief flash of red, then the sample will become yellow or clear. For very high chlorine levels, it may be necessary to dilute the sample to obtain an endpoint.

Another common error is not allowing the sample to sit in contact with the DPD reagent for the necessary reaction time.

Make sure to rinse vials thoroughly between uses to avoid carry-over. Follow the manufacturer's instructions for your chlorine analyzer when measuring high chlorine levels. Water samples with a high chlorine residual may require that additional dechlorinating agent be added to the sample container.

See **Appendix H** for specific instructions on operating the *Hach Pocket Colorimeter II™*.

Colorimeters must be **checked for consistency** using secondary gel standards at least weekly. Logs for consistency checks must include:

1. Lot number of the standards and expiration date,
2. colorimeter serial number,
3. standard values and ranges,

4. readings for each standard,
5. pass/fail indicator,
6. check date, and
7. sampler name.

A copy of each Certificate of Analysis from each lot of gel standards must be maintained along with the date range the standards were in use.

Colorimeters must also be **verified for accuracy** at least once every 90 days using chlorine solutions of known concentrations [§290.46(s)(2)(C)(i)]. If a disinfectant residual analyzer produces a result which is not within 15% of the expected value, the cause of the discrepancy must be determined and corrected and, if necessary, the instrument must be recalibrated [§290.46(s)(2)(C)(iii)]. Logs for accuracy checks must include:

1. Chlorine solution lot number and expiration date,
2. colorimeter serial number,
3. standard solution concentration and range,
4. standard reading
5. pass/fail indicator,
6. check date, and
7. sampler name.

A copy of each Certificate of Analysis (label) from each lot of chlorine solution ampules must be maintained along with the range of dates the solutions were in use.

Temperature

Thermometers must have a minimum accuracy of ±0.5 °C and utilize an EPA-approved drinking water method.

Liquid bearing thermometers (mercury or alcohol) must be verified for accuracy at least annually using a National Institute of Standards and Technology (NIST)-traceable thermometer with valid calibration. The correction factor shall be indicated on the thermometer.

Digital thermometers, thermocouples, or other similar electronic temperature measuring devices must be verified for accuracy at least quarterly using a NIST-traceable thermometer with valid calibration [MCLADW, Ch. IV, 7.1.5]. Logs for accuracy checks must include:

1. NIST thermometer serial number and expiration date,
2. sampling thermometer serial number,
3. cool and warm water readings,
4. pass/fail indicator,
5. correction factor (if applicable),
6. check date, and
7. sampler name.

A copy of each Certificate of Calibration (label) from each NIST thermometer must be maintained along with the range of dates the traceable thermometer was in use.

Sample/Field Blank Storage

Temperature logs must be maintained for refrigerators that are used to store field blank water and/or samples before shipment. Temperatures must be checked daily at minimum,

including weekends and holidays. Target temperature for sample/field blank storage is 4°C, with the temperature maintained above 0°C (freezing). Thermometers used for measurement inside the refrigerator should be stored in liquid to maintain consistency. Refrigerator temperature logs must include:

1. Date and time of check,
2. temperature in degrees Celsius,
3. name/initials,
4. whether or not adjustments were made, and
5. any applicable notes.

pH

pH meters must have a minimum accuracy of ±0.1 standard units (su) and utilize an EPA-approved drinking water method.

Samplers are required to use a pH meter calibrated with three points. pH meters must be calibrated each day before use [§290.46(s)(2)(A)(i)] under the same conditions under which samples are collected (i.e. in the field). Three pH buffers must be used to calibrate the pH meter: pH 4, pH 7, and pH 10 buffers are required. You should start with the pH 7 buffer. An additional pH 7 buffer from a different manufacturer than the pH 7 buffer used for calibration must be used as a calibration check. The pH reading of the buffer used for a check must be within 0.1 units of the known value for the calibration to be considered acceptable. The calibration check must be done each time the pH meter is used (i.e. each sample site). If the calibration check is out of range, the calibration must be repeated. [§290.46(s)(2)(A)(ii)] Always use fresh buffer solution. Pour an aliquot of buffer into a small plastic container for calibration and discard when calibration is complete. Never pour used buffer back into the original container. This will contaminate the solution and will no longer be usable. pH calibrations and checks must be documented and available for inspection.

Logs for pH calibration must include:

1. Buffer solution lot numbers and expiration dates,
2. pH meter serial number,
3. buffer readings,
4. pass/fail indicator,
5. calibration date, and
6. sampler name.

A copy of each Certificate of Analysis (label) from each lot of buffer solution shall be maintained along with the range of dates the solutions were in use.

Distilled or deionized water shall be used to rinse the pH probe between buffers and after measuring samples. Store the probes according to manufacturer's recommendations to prevent the probe from drying out. A probe that has dried out will no longer produce accurate results.

Typical pH meter

Recording Locations

The latitude and longitude of each sample site must be recorded electronically or on the PWS Water Analysis Form. This data will be compared to data in SDWIS to ensure samples are collected from the correct locations. Ensure that locations are measured as close to the sample tap as possible. Instruments used to collect GPS data must be able to measure in digital degrees with at least six decimal places. Tablets, phones or other devices are permitted as long as they meet these requirements.

The sample collection location must be within 50 meters of the location on file with TCEQ and stored in the SDWIS database. Locations that are 50 meters or greater than data on file will be reviewed by TCEQ and any associated samples collected at incorrect locations are subject to rejection. Rejected samples will have to be recollected according to contract requirements.

TCEQ maintains Google Earth KML files to aid in determining location accuracy. See **Appendix O** for additional information.

Section 12—Laboratory Sample Receipt

Each environmental lab has a sample receiving or check-in station and specific lab check-in procedures. When samples are received, they are checked in by the staff and the receipt is recorded on the lab COC form. Each sample label is matched to the submitted COC and sample submission form, assigned a unique lab identification number, checked for appropriate preservation, including temperature, and delivered to the respective analyst.

When a sample cannot be matched to the submitted COC or sample submission form or is broken in transit, has an unacceptable temperature, has missing or incorrect information on the submission form, exceeds method hold times, or when the sample is missing, the samples are invalidated at the check-in station.

Sample Invalidation

Each laboratory is responsible for invalidating samples that do not meet TCEQ requirements. See **Appendix F** for rejection reasons and codes. Samples may be rejected for a variety of reasons, including:

- Missing, incomplete, or incorrect submission forms (or approved electronic equivalent data)
- Missing, incomplete, or incorrect COC (or approved electronic equivalent data)
- Missing, broken, or tampered custody seal
- Invalid sampling protocols (pH out of range, head space, chlorine residual, temperature, etc.)
- Inability to properly identify samples
- Leaking or broken sample containers
- Minerals [MIN] or Secondary [SEC] samples that are missing pH field measurement

The laboratories are not authorized to make corrections to forms unless directed by the TCEQ PWSSP QA Manager. If there is a question regarding sample invalidation, the laboratory or the sampler should contact the TCEQ PWSSP QA Manager for guidance. The samplers or sample contractor shall not contact the laboratory directly regarding invalid samples or rejections.

In no case shall changes be made after the PWS representative has signed the submission form unless the TCEQ has been consulted and grants permission. Under these circumstances, all copies must be corrected identically; including single-line strike-through, initialing, and dating.

The laboratories must notify the TCEQ and sample contractor of invalidated samples on a daily basis. If a laboratory deals directly with a PWS, they shall notify the PWS directly of rejected samples. The sample contractor is responsible for rescheduling and recollecting rejected samples, as appropriate.

Temperature Exception

Samples that arrive at the laboratory on ice less than 24 hours after collection may not yet have reached the appropriate temperature. These samples shall be considered acceptable ONLY if packed on ice immediately after sample collection and delivered while the samples are in the process of reaching the required temperature. [MCLADW, Supplement 1, p. 6]

Appendix A—Analyte [Codes] and {Groups}

ASBESTOS [1094]

BETA RADIOCHEMICALS {BETA}
Cesium 134 [4270]
Cesium 137 [4276]
Iodine 131 [4264]
Potassium [1042]
Strontium 89 [4172]
Strontium 90 [4174]
Tritium [4102]
Gamma emitters as detected

CYANIDE
Free [CNFR]
Total [1024]

DISINFECTION BYPRODUCTS {DBP2}
See Haloacetic Acids and Trihalomethanes

DIQUAT (EPA 549.2) [2032]
UNREGULATED
Paraquat [2028]

DRINKING WATER QUALITY {DWQ}
Alkalinity [1927, 1928, 1929, 1931]
Calcium [1016]
Chloride [1017]
Conductivity [1064]
Copper [1022]
Hardness [1915]
Iron [1028]
Lead [1030]
Manganese [1032]
Magnesium [1031]
Orthophosphate [1044]
pH *(Field measurement)*
Silica [1049]
Sodium [1052]
Sulfate [1055]
TDS [1930]
Temperature *(Field measurement)*

EDB/DBCP {504}
REGULATED
Ethylene Dibromide (EDB) [2946]
1,2-Dibromo-3-chloropropane (DBCP) [2931]
UNREGULATED
1,2,3-Trichloropropane [2414]

ENDOTHALL (EPA 548.1) [2033]

GLYPHOSATE (EPA 547) [2034]

HALOACETIC ACIDS
REGULATED
Total Haloacetic Acids [2456]
REPORTED
Monochloroacetic Acid [2450]
Dichloroacetic Acid [2451]
Trichloroacetic Acid [2452]
Monobromoacetic Acid [2453]
Dibromoacetic Acid [2454]
Bromochloroacetic Acid [2455]

METALS {MTL}
REGULATED
Antimony (Sb) [1074]
Arsenic (As) [1005]
Barium (Ba) [1010]
Beryllium (Be) [1075]
Cadmium (Cd) [1015]
Chromium (Cr) [1020]
Mercury (Hg) [1035]
Selenium (Se) [1045]
Thallium (Tl) [1085]
SECONDARIES
Aluminum (Al) [1002]
Copper (Cu) [TXCU]
Iron (Fe) [1028]
Manganese (Mn) [1032]
Silver (Ag) [1050]
Zinc (Zn) [1095]
OTHER
Calcium (Ca) [1016]
Lead (Pb) [TXPB]
Magnesium (Mg) [1031]
Nickel (Ni) [1036]
Potassium (K) [1042]
Sodium (Na) [1052]
Total Hardness [1915]

MINERALS {MIN}
REGULATED
Fluoride (F) [1025]
Nitrate (NO3) [1040]
Nitrite (NO2) [1041]
SECONDARIES
Chloride (Cl) [1017]
Fluoride (F) [1025]
Sulfate (SO4) [1055]
TDS [1930]
OTHER
Alkalinity, Bicarbonate (HCO3) [1928]
Alkalinity, Carbonate (CO3) [1929]
Dil. Conductance [1064]
P Alkalinity [1931]
pH [1925]
Total Alkalinity [1927]

NITRATE/NITRITE {NO32}
Nitrate (NO_3) [1040]
Nitrite (NO_2) [1041]
NITRATE [1040]

PCBs (EPA 508A)
PCB's as Decachlorobiphenyl [2383]

RADIONUCLIDES {RAD}
Gross alpha, incl. Rn & U [4002]
Gross beta [4100]
Radium 226 [4020]
Radium 228 [4030]
Uranium 234 [4007]
Uranium 235 [4008]
Uranium 238 [4009]
Uranium, Combined [4006]

SECONDARIES {SEC}
Aluminum (Al) [1002]
Chloride (Cl) [1017]
Copper (Cu) [TXCU]
Fluoride (F) [1025]
Iron (Fe) [1028]
Manganese (Mn) [1032]
pH [1925]
Silver (Ag) [1050]
Sulfate (SO_4) [1055]
TDS [1930]
Zinc (Zn) [1095]

SYNTHETIC ORGANIC CHEMICALS GROUP 5 {SOC5}
REGULATED
Alachlor [2051]
Atrazine [2050]
Benzo[a]pyrene [2306]
Chlordane [2959]
Di(ethylhexyl)-adipate [2035]
Di(ethylhexyl)-phthalate [2039]
Endrin [2005]
Heptachlor [2065]
Heptachlor epoxide [2067]
Hexachlorobenzene (HCB) [2274]

Hexachlorocyclopentadiene [2042]
Lindane [2010]
Methoxychlor [2015]
Pentachlorophenol (PCP) [2326]
Simazine [2037]
Toxaphene [2020]

SCREENED
Aroclor 1016 [2388]
Aroclor 1221 [2390]
Aroclor 1232 [2392]
Aroclor 1242 [2394]
Aroclor 1248 [2396]
Aroclor 1254 [2398]
Aroclor 1260 [2400]

UNREGULATED
2-Chlorobiphenyl [2344]
Acenaphthene [2261]
Acenaphthylene [2260]
Aldrin [2356]
Anthracene [2280]
Benzo[a]anthracene [2300]
Benzo[b]fluoranthene [2302]
Benzo[g,h,i]perylene [2312]
Benzo[k]fluoranthene [2304]
Bromacil [2098]
Butachlor [2076]
Butylbenzylphthalate [2294]
Chrysene [2296]
Dibenzo[a,h]anthracene [2310]
Dieldrin [2070]
Diethylphthalate [2284]
Dimethylphthalate [2282]
Di-n-butylphthalate [2290]
Fluorene [2264]
Indeno[1,2,3-cd]pyrene [2308]
Metolachlor [2045]
Metribuzin [2595]
Naphthalene [2248]
Phenanthrene [2278]
Propachlor [2077]
Trans-Nonachlor [2273]
Trifluralin [2055]

SOC METHOD 515.4 {515}

REGULATED
2,4,5-TP (Silvex) [2110]
2,4-D [2105]
Dalapon [2031]
Dinoseb [2041]
Pentachlorophenol [2326]
Picloram [2040]

UNREGULATED
2,4,5-T [2111]
2,4-DB [2106]
3,5-Dichlorobenzoic acid [T002]
Acifluorfen [T001]
Bentazon [2625]
Chloramben [2205]
Dicamba [2440]
Dichlorprop [2206]
Quinclorac [T003]

SOC METHOD 531.1 {531}

REGULATED
Aldicarb [2047]
Aldicarb Sulfone [2044]
Aldicarb Sulfoxide [2043]
Carbofuran [2046]
Oxamyl [2036]

UNREGULATED
3-Hydroxycarbofuran [2066]
Baygon [2023]
Carbaryl [2021]
Methiocarb [2024]
Methomyl [2022]

TRIHALOMETHANES

REGULATED
Total Trihalomethanes [2950]

REPORTED
Bromoform [2942]
Bromodichloromethane [2943]
Chloroform [2941]
Dibromochloromethane [2944]

VOLATILE ORGANIC CHEMICALS {VOC}

REGULATED:
1,1,1-Trichloroethane [2981]
1,1,2-Trichloroethane [2985]
1,1-Dichloroethylene [2977]
1,2,4-Trichlorobenzene [2378]
o-Dichlorobenzene [2968]
1,2-Dichloroethane [2980]
1,2-Dichloropropane [2983]
p-Dichlorobenzene [2969]
Benzene [2990]
Carbon tetrachloride [2982]
Chlorobenzene [2989]
cis-1,2-Dichloroethylene [2380]
Dichloromethane [2964]
Ethylbenzene [2992]
Styrene [2996]
Tetrachloroethylene [2987]
Toluene [2991]
trans-1,2-Dichloroethylene [2979]
Trichloroethylene [2984]
Vinyl chloride [2976]
Xylenes (total) [2955]

UNREGULATED
1,1,1,2-Tetrachloroethane [2986]
1,1,2,2-Tetrachloroethane [2988]
1,1-Dichloroethane [2978]
1,1-Dichloropropene [2410]
1,2,3-Trichlorobenzene [2419]
1,2,3-Trichloropropane [2414]
1,2,4-Trimethylbenzene [2418]
1,3,5-Trimethylbenzene [2424]
1,3-Dichlorobenzene [2967]
1,3-Dichloropropane [2412]
2,2-Dichloropropane [2416]
2-Butanone (MEK) [2247]
2-Chlorotoluene [2965]
2-Hexanone [2269]
4-Chlorotoluene [2966]
4-Isopropyltoluene [2030]
4-Methyl-2-pentanone (MIBK) [2277]
Acetone [2243]
Acrylonitrile [2240]
Bromobenzene [2993]
Bromochloromethane [2430]
Bromodichloromethane [2943]
Bromoform [2942]
Bromomethane [2214]
Carbon disulfide [1902]
Chloroethane [2216]
Chloroform [2941]
Chloromethane [2210]
cis-1,3-Dichloropropene [2228]
Dibromochloromethane [2944]
Dibromomethane [2408]
Dichlorodifluoromethane [2212]
Ethyl methacrylate [2293]
Hexachlorobutadiene [2246]
Iodomethane [2458]
Isopropylbenzene [2994]
Methyl methacrylate [2295]
Methyl-t-butyl-ether (MTBE) [2251]
Naphthalene [2248]
n-Butylbenzene [2422]
n-Propylbenzene [2998]
s-Butylbenzene [2428]
t-Butylbenzene [2426]
Tetrahydrofuran [2263]
trans-1,3-Dichloropropene [2224]
Trichlorofluoromethane [2218]

TENTATIVE ID AS FOUND

Appendix B — Sample Schedule Field Definitions

Table B.1 contains the fields and definitions for the annual sample schedule table (LST). Fields are equivalent to the SDWIS when applicable. Any changes to the Annual Sample Schedule must be pre-approved by the TCEQ.

Table B.1. Annual Sample Schedule Field Definitions

FIELD NAME	OWNER-SHIP	DESCRIPTION	VALID CONTENT	TYPE	SIZE
B_STATE_SAMPLE_NUMBER	TCEQ	Unique sample ID number	TCEQ ID	Text	7
B_PWS_NUMBER	TCEQ	Public water supply identification number. First 3 numbers correspond to the county code. Preceded by "TX"		Text	9
B_WSF_STATE_ASGN_ID	TCEQ	Facility ID Code	"EP" + 3 digit number for entry point; DS01 for distribution; or source code	Text	12
B_SAMPLING_POINT	TCEQ	Sampling Point	TRT-TAP, RAW-TAP, DBP1-01, etc.	Text	12
B_SAMPLING_LOCATION	TCEQ	Sampling location (address or tap location)	USPS format or 911 address	Text	40
B_ANALYTE_CODE	TCEQ	Analyte code for single analytes	SDWIS analyte codes	Text	4
B_ANALYTE_GROUP_CD	TCEQ	B_ANALYTE_GROUP_CD	SDWIS analyte groups	Text	12
B_COMPLIANCE_INDICATOR	TCEQ	Whether or not sample is for compliance	Y or N	Text	1
B_SAMPLE_TYPE	TCEQ	SDWIS Sample Type	RT, CO, SP or FB	Text	2
B_SAMPLE_CATEGORY	TCEQ	SDWIS Sample Category	Default to GE	Text	2
B_LABORATORY_CERTIFYING_AGENCY	TCEQ	SDWIS lab certifying agency	Default to STATE	Text	5
B_COLLECTION_DATE	Contractor	The date the sampling contractor collected the sample.		Date	
B_COLLECTION_TIME	Contractor	The time the sampling contractor collected the sample		Time	
B_COLLECTOR_NAME	Contractor	The name of the sampler who collected the sample.		Text	40
B_FREE_CHLORINE_RESIDUAL	Contractor	Free chlorine residual in mg/L	2 decimal places	Number	
B_TOTAL_CHLORINE_RESIDUAL	Contractor	Total chlorine residual in mg/L	2 decimal places	Number	
B_SAMPLE_WATER_TEMPERATURE	Contractor	The temperature of the water after flushing is completed	Whole numbers, no decimals	Number	
B_TEMPERATURE_UNIT_MEASURE	Contractor	Temperature Units	C or F	Text	1
B_PH_MEASURE	Contractor	pH measurement	Number with one decimal	Number	

Table B.1. Annual Sample Schedule Field Definitions

FIELD NAME	OWNER-SHIP	DESCRIPTION	VALID CONTENT	TYPE	SIZE
B_REPLACEMENT_INDICATOR	Contractor	Indicates whether or not this sample replaces a previously rejected sample	Y or N	Text	1
B_ORIGINAL_LAB_SAMPLE_NUMBER	Contractor	Lab ID of original sample for recollected samples	Lab ID	Text	11
B_ORIGINAL_COLLECTION_DATE	Contractor	Collection date of original sample for recollected samples	Date	Date	
B_SAMPLE_REJECTION_REASON	LAB	Sample rejection code	See Appendix G	Text	2
COMPOSITE	TCEQ	Whether or not the sample was composited.	Y or N	Text	1
WSF_NAME	TCEQ	Facility Description		Text	40
SAMP_PERIOD	TCEQ	Sample collection period	See Appendix C	Text	15
SEASON_BEGIN_MONTH	TCEQ	Season Begin Month	Long integer	Number	
SEASON_BEGIN_DAY	TCEQ	Season Begin Day	Long integer	Number	
SEASON_END_MONTH	TCEQ	Season End Month	Long integer	Number	
SEASON_END_DAY	TCEQ	Season End Day	Long integer	Number	
PRIORITY	TCEQ	Sample Priority Type	N, 24H, 48H, 1WK or 2WK	Text	3
TCEQ_COMM	TCEQ	TCEQ sample comments		Text	255
LAB	Contractor	Lab the sample was submitted to	DSHS, LCRA, CRISP	Text	12
ENTRY_DATE	Contractor	Date that record was entered by the contractor.		Date	
CONTRACTOR_COMM	Contractor	Contractor notes concerning sample: Dups, Trips, Special Requests, etc.		Text	255
COUNTY	TCEQ	County name where water system is located		Text	14
DELETE	TCEQ	Field describing whether the sample was cancelled or not.	Y or blank	Text	1
FR_CODE	Contractor	The field report code. Typically why a sample was not collected.	See Section 10	Text	25
FR_DATE	Contractor	Date Field Report was created		Date	
UPDATE_NAME	TCEQ	Individual requesting update	SDWIS User Name	Text	40
UPDATE_TYPE	TCEQ	Indicates what type of record came in on monthly update	ADD, CHNG, CNCL, RES	Text	5
UPDATE_METHOD	TCEQ	Documents how the information came in to YEARLST.	MU - monthly update CN - contractor	Text	5
UPDATE_DATE	TCEQ	Documents date that new information comes in to YEARLST.		Date	
REMARKS	TCEQ	Remarks		Text	250
INVOICE_DATE	TCEQ	Date sample approved for payment		Date	
INVOICE_COMM	TCEQ	Invoice comments		Text	50

Table B.1. Annual Sample Schedule Field Definitions

FIELD NAME	OWNER-SHIP	DESCRIPTION	VALID CONTENT	TYPE	SIZE
EDR	TCEQ	Whether or not electronic results data has been received	Yes/No	Yes/No	
DELINQUENT	TCEQ	Whether or not a water system is delinquent paying lab fees	Yes/No	Yes/No	
CONTAINER	TCEQ	Required Sample Container		Text	50
PRESERVATION	TCEQ	Required Preservation		Text	50
FLUSH_START	Contractor	The time flushing begins	Military time	Time	
FLUSH_END	Contractor	The time flushing ends	Military time	Time	
PWS_REP	Contractor	PWS Representative Name		Text	40
LATITUDE	TCEQ	Latitude of water system facility	6 decimal places	Number	
LONGITUDE	TCEQ	Longitude of water system facility	6 decimal places	Number	
LAB_RCD_DT	TCEQ	Date sample received by lab		Date	
TINWSYS_IS_NUMBER	TCEQ	SDWIS database identifier	Record number	Number	
LAB_QC	Contractor	Duplicates collected for QC	Y or N	Text	1
TCEQ_PAY	Contractor	TCEQ Pays for analysis	Y or N	Text	1
INCLUDED	Contractor	TCEQ ID(s) of other samples included in this one	TCEQ ID Number(s)	Text	30
COLLECTED_LATITUDE	Contractor	Latitude of sample site	6 decimal places	Number	
COLLECTED_LONGITUDE	Contractor	Longitude of sample site	6 decimal places	Number	
GPS_DIFF_M	TCEQ	Difference in meters between sample site and collection site	Whole number, no decimal	Number	
COLLECTED_SAMPLING_LOCATION	Contractor	Location of sample site	USPS format or 911 address	Text	80
ORIGINAL_TCEQ_ID	Contractor	Original TCEQ for rejected samples	TCEQ ID	Text	7
RESAMPLED	Contractor	Whether or not a rejected sample was resampled	Yes/No	Yes/No	

Appendix C — Annual Schedule Analyte Groups and Codes

An analysis is requested in the annual schedule table by using either an analyte group or an analyte code. See Table A.1 in Appendix A for individual analytes included in each analyte group.

Table C.1. Annual Schedule Sample Type Designations

DESCRIPTION	SDWIS		State Classification Code
	Analyte Group	Analyte Code	
Arsenic		1005	IOC
Asbestos		1094	IOC
Beta Radiochemicals	BETA		RAD
Barium		1010	IOC
Copper		TXCU	IOC
Cyanide – Free		CNFR	IOC
Cyanide - Total		1024	IOC
Diquat		2032	SOC
Disinfection Byproducts Group	DBP2		DBP
Drinking Water Quality	DWQ		WQP
Endothall		2033	SOC
Ethylene dibromide (EDB) & Dibromochloropropane (DBCP)	504		SOC
Fluoride		1025	IOC
Glyphosate		2034	SOC
Haloacetic acids (HAA5)		2456	DBP
Iron		1028	IOC
Lead		TXPB	IOC
Manganese		1032	IOC
Mercury		1035	IOC
Metals group	MTL1		IOC
Minerals group - includes nitrate	MIN		IOC
Nitrate		1040	IOC
Nitrate/Nitrite	NO32		IOC
Nitrite		1041	IOC
PCBs		2383	SOC
Radiochemicals	RAD		RAD
Secondary Group	SEC1		IOC
Selenium		1045	IOC
SOC5 group	SOC5		SOC
SOC Method 515.4 group	515		SOC
SOC Method 531.1 group	531		SOC
Sodium		1052	IOC
Sulfate		1055	IOC
Total Dissolved Solids (TDS)		1930	IOC
Thallium		1087	IOC
Trihalomethanes		2950	DBP
Volatile organic chemicals	VOC		VOC

Table C.2. SAMP_PERIOD Field Descriptions

SAMP_PERIOD Field	DESCRIPTION
1Q####	First quarter sample, collect during January through March
2Q####	Second quarter sample, collect during April through June
3Q####	Third quarter sample, collect during July through September
4Q####	Fourth quarter sample, collect during October through December
YR####	Annual sample, collected every year
3Y####	Annual sample, collected once every three years
6Y####	Annual sample, collected once every six years
9Y####	Annual sample, collected once every nine years
Note—#### refers to the current year, i.e. 2018	

The SEASON_BEGIN and SEASON_END fields may indicate a specific time period during which sample collection should occur. Use the SAMP_PERIOD field in combination with the SEASON_BEGIN and SEASON_END fields to determine the proper time to collect samples.

SDWIS	Analyte codes are stored in the TSAANLYT table. Analyte groups are stored in the TSAANGRP table.

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Appendix D — Laboratory Analysis Fees

Table 13.1. Current Compliance Laboratory Analysis Fees

Analysis Type	Effective 1/1/2018
EPA 504.1 - EDB / DBCP	$ 75.67
EPA 515.4 (Chlorophenoxy Herbicides)	$ 313.25
EPA 531.1 (Carbamate Insecticides)	$ 57.01
Asbestos [Crisp Analytical]	$ 130.00
Chloride	$ 15.11
Cyanide - Free (Confirmation) **[DSHS ONLY]**	$ 113.43
Cyanide - Total (Screen)	$ 53.75
Diquat (EPA 549.2) **[DSHS ONLY]**	$ 72.09
Disinfection Byproducts Group (HAA5 & TTHM)	$ 103.85
Drinking Water Quality Group {DWQ}	$ 150.54
Endothall (EPA 548.1) **[DSHS ONLY]**	$ 265.63
Fluoride	$ 15.03
Glyphosate (EPA 547) **[DSHS ONLY]**	$ 39.40
Mercury (EPA 245.1)	$ 18.41
Metals Group {MTL1}	$ 160.16
Metals Sample Preparation Fee (For samples with turbidity > 1 NTU)	$ 20.29
Minerals Group {MIN}	$ 102.25
Nitrate and/or Nitrite	$ 8.49
PCB (EPA 508A)	$ 1,045.02
Radionuclides {RAD/BETA} [DSHS ONLY] Gross Alpha & Beta, Radium 228, and Uranium (mass) are conducted for all samples. Further testing will depend upon these results.	
Radiochemical Group (Gross α & β, Radium 228, Uranium)	$ 279.35
Gamma Emitting Isotopes (EPA 901.1)	$ 36.53
Gross Alpha and/or Beta (EPA 900.0)	$ 170.73
Radium 226 (SM 7500 RaC)	$ 43.24
Radium 228 (SM 7500 RaD)	$ 101.74
Strontium-89 or 90 (EPA 905.0)	$ 152.89
Tritium (EPA 906.0)	$ 73.19
Uranium Isotopes, Radioactivity (SM 7500 UC)	$ 104.81
Uranium, Mass (EPA 200.8)	$ 6.88
RTCR (Total coliform / *E. coli*) **[DSHS ONLY]**	$16.19
Secondaries {SEC1}	$ 102.03
Single Metal—Arsenic, Barium, Cadmium, Manganese, Selenium, or Thallium (EPA 200.8, ICP-MS)	$ 6.88
Single Metal—Iron, Sodium (EPA 200.7, ICP)	$ 7.73
SOC5 Group (EPA 525.2, 508.1)	$ 205.41
TDS (Total Dissolved Solids)	$ 14.65
Total Haloacetic Acids {HAA5} (EPA 552.2)	$ 53.72
Trihalomethanes {TTHM} (EPA 502.2/524.2)	$ 50.13
VOC (EPA 524.2)	$ 55.12

Each PWS must pay for all samples collected for compliance under Subchapter F and for new wells. The DWQ Team makes every attempt to minimize sampling costs to systems, while ensuring that drinking water quality is adequately monitored. Laboratory analysis fees are subject to change annually. A comprehensive fee schedule can be found on the DSHS website.

In many cases, laboratory fees for special samples are paid by TCEQ, indicated by "TCEQ-PAY" in the sample schedule. All "TCEQ PAY" samples MUST go to the DSHS laboratory for analysis.

Appendix E — Sample Location (Tap) Abbreviations

Table E. 1. Common Sample Location (Tap) Abbreviations

Abbreviation	Description
DL	Discharge Line
E	East
EST	Elevated Storage Tank
FV	Flush Valve
GST	Ground Storage Tank
HB	Hose Bibb
HS	High Service
HSP	High Service Pump
IC	Interconnect
LK	Lake
LS	Low Service
MG	Million Gallons
MH	Mobile Home
MHP	Mobile Home Park
N	North
NW	Northwest
PH	Pump House
PLT or PLNT	Plant
POE	Point of Entry
PS	Pump Station
PT	Pressure Tank
RO	Reverse Osmosis
S	South
SP	Service Pump
ST	Storage Tank
STP	Stand Pipe
SUB or SUBD	Subdivision
SW	Southwest
SW	Surface Water
SWP	Surface Water Plant
SWTP	Surface Water Treatment Plant
TRT or TRTD	Treated
W	West
WH	Well House
WS	Water System
WTP	Water Treatment Plant

Appendix F — Rejection Codes

Table F.1. Rejection Codes

CODE	DESCRIPTION
AR	**A**gency **R**ejected (TCEQ Use Only)
BR	**BR**oken in Transit
BP	Invalid Sample Point
CA	**CA**ncel Test
CI	**C**an't **I**D
CL	**C**h**L**orine Present
CM	**C**hain of Custody—**M**issing Sample
CN	**C**hain of Custody **N**ot Signed
CP	**C**ancelled (**P**ayable)
EH	**E**xceeded **H**old Time
FZ	Sample **F**ro**Z**en
HS	Excess **H**ead **S**pace
IC	**I**nvalid **C**ontainer
ID	**I**nvalid **D**ate/Time
IF	**I**nvalid **F**ield Measurement
IN	**IN**sufficient Sample Information
PR	Improperly **PR**eserved
IP	**I**nvalid Sampling **P**rotocol
LA	**LA**b Accident
LE	**L**ab **E**rror / Lab QC Failure
LT	**L**eaked In **T**ransit
MF	Submission form and chain of custody do not match
MP	**M**issing **p**H (when required)
MT	**M**ultiple **T**ests Requested
NC	**N**o **C**hlorine Residual
ND	**N**o **D**ate/Time
NM	**N**ot **M**easured
NR	**N**o Sample **R**eceived
NS	**N**o **S**ampler Signature
NT	**N**o **T**est Specified
PH	**pH** Out of range
PS	No **P**WS Representative **S**ignature
QC	QA/**QC**
QI	**Q**uantity **I**nsufficient
RL	**R**eporting **L**imit not met
RS	**R**edundant **S**ample
SB	Custody **S**eal **B**roken/Tampered
SE	**S**hipping **E**rror
SM	Custody **S**eal **M**issing
TH	**T**emperature Too **H**igh
TN	**T**est **N**ot Available
VO	Insufficient **VO**lume
WL	**W**rong **L**ocation

Appendix G — List of Counties and TCEQ Regions

All PWS ID numbers begin with a three-digit county code in Table G.1. This table also lists the TCEQ regional office associated with the county.

Table G.1. List of Counties and TCEQ Regions

County Code	County Name	TCEQ Regional Office #		County Code	County Name	TCEQ Regional Office #		County Code	County Name	TCEQ Regional Office #
002	Andrews	7		088	Goliad	14		174	Nacogdoches	10
003	Angelina	10		089	Gonzales	14		175	Navarro	4
004	Aransas	14		090	Gray	1		176	Newton	10
005	Archer	3		091	Grayson	4		177	Nolan	3
006	Armstrong	1		092	Gregg	5		178	Nueces	14
007	Atascosa	13		093	Grimes	9		179	Ochiltree	1
008	Austin	12		094	Guadalupe	13		180	Oldham	1
009	Bailey	2		095	Hale	2		181	Orange	10
010	Bandera	13		096	Hall	1		182	Palo Pinto	4
011	Bastrop	11		097	Hamilton	9		183	Panola	5
012	Baylor	3		098	Hansford	1		184	Parker	4
013	Bee	14		099	Hardeman	3		185	Parmer	1
014	Bell	9		100	Hardin	10		186	Pecos	7
015	Bexar	13		101	Harris	12		187	Polk	10
016	Blanco	11		102	Harrison	5		188	Potter	1
017	Borden	7		103	Hartley	1		189	Presidio	6
018	Bosque	9		104	Haskell	3		190	Rains	5
019	Bowie	5		105	Hays	11		191	Randall	1
020	Brazoria	12		106	Hemphill	1		192	Reagan	8
021	Brazos	9		107	Henderson	5		193	Real	13
022	Brewster	6		108	Hidalgo	15		194	Red River	5
023	Briscoe	1		109	Hill	9		195	Reeves	7
024	Brooks	15		110	Hockley	2		196	Refugio	14
025	Brown	3		111	Hood	4		197	Roberts	1
026	Burleson	9		112	Hopkins	5		198	Robertson	9
027	Burnet	11		113	Houston	10		199	Rockwall	4
028	Caldwell	11		114	Howard	7		200	Runnels	3
029	Calhoun	14		115	Hudspeth	6		201	Rusk	5
030	Callahan	3		116	Hunt	4		202	Sabine	10
031	Cameron	15		117	Hutchinson	1		203	San Augustine	10
032	Camp	5		118	Irion	8		204	San Jacinto	10
033	Carson	1		119	Jack	3		205	San Patricio	14
034	Cass	5		120	Jackson	14		206	San Saba	9
035	Castro	1		121	Jasper	10		207	Schleicher	8
036	Chambers	12		122	Jeff Davis	6		208	Scurry	3
0.37	Cherokee	5		123	Jefferson	10		209	Shackelford	3

Table G.1. List of Counties and TCEQ Regions

County Code	County Name	TCEQ Regional Office #		County Code	County Name	TCEQ Regional Office #		County Code	County Name	TCEQ Regional Office #
038	Childress	1		124	Jim Hogg	15		210	Shelby	10
039	Clay	3		125	Jim Wells	14		211	Sherman	1
041	Coke	8		127	Jones	3		213	Somervell	4
042	Coleman	3		128	Karnes	13		214	Starr	15
043	Collin	4		129	Kaufman	4		215	Stephens	3
044	Collingsworth	1		130	Kendall	13		216	Sterling	8
045	Colorado	12		131	Kenedy	15		217	Stonewall	3
046	Comal	13		132	Kent	3		218	Sutton	8
047	Comanche	3		133	Kerr	13		219	Swisher	1
048	Concho	8		134	Kimble	8		220	Tarrant	4
049	Cooke	4		135	King	2		221	Taylor	3
050	Coryell	9		136	Kinney	16		222	Terrell	7
051	Cottle	3		137	Kleberg	14		223	Terry	7
052	Crane	7		138	Knox	3		224	Throckmorton	3
053	Crockett	8		139	Lamar	5		225	Titus	5
054	Crosby	2		140	Lamb	2		226	Tom Green	8
055	Culberson	6		141	Lampasas	9		227	Travis	11
056	Dallms	1		142	La Salle	16		228	Trinity	10
057	Dallas	4		143	Lavaca	14		229	Tyler	10
058	Dawson	7		144	Lee	11		230	Upshur	5
059	Deaf Smith	1		145	Leon	9		231	Upton	7
060	Delta	5		146	Liberty	12		232	Uvalde	13
061	Denton	4		147	Limestone	9		233	Val Verde	16
062	DeWitt	14		148	Lipscomb	1		234	Van Zandt	5
063	Dickens	2		149	Live Oak	14		235	Victoria	14
064	Dimmit	16		150	Llano	11		236	Walker	12
065	Donley	1		151	Loving	7		237	Waller	12
066	Duval	16		152	Lubbock	2		238	Ward	7
067	Eastland	3		153	Lynn	2		239	Washington	9
068	Ector	7		154	McColloch	8		240	Webb	16
069	Edwards	13		155	McLennan	9		241	Wharton	12
070	Ellis	4		156	McMullen	16		242	Wheeler	1
071	El Paso	6		157	Madison	9		243	Wichita	3
072	Erath	4		158	Marion	5		244	Wilbarger	3
073	Falls	9		159	Martin	7		245	Willacy	15
074	Fannin	4		160	Mason	8		246	Williamson	11
075	Fayette	11		161	Matagorda	12		247	Wilson	13
076	Fisher	3		162	Maverick	16		248	Winkler	7
077	Floyd	2		163	Medina	13		249	Wise	4
078	Foard	3		164	Menard	8		250	Wood	5
079	Fort Bend	12		165	Midland	7		251	Yoakum	2
080	Franklin	12		166	Milam	9		252	Young	3

Table G.1. List of Counties and TCEQ Regions

County Code	County Name	TCEQ Regional Office #		County Code	County Name	TCEQ Regional Office #		County Code	County Name	TCEQ Regional Office #
081	Freestone	9		167	Mills	9		253	Zapata	16
082	Frio	13		168	Mitchell	3		254	Zavala	16
083	Gaines	7		169	Montague	3				
084	Galveston	12		170	Montgomery	12				
086	Gillespie	13		172	Morris	5				
087	Glasscock	7		173	Motley	2				

Appendix H — Field Measurement Procedures for Chlorine

Chlorine Measurement Using the Hach Pocket ColorimeterTM II

The following instructions are specific to the Mid-Range/High-Range Hach Pocket Colorimeter II (Model 5870062). Consult your specific manufacturer's operating guidelines if you are using any other model, brand, or type of instrument.

PRECAUTIONS

1. Collect samples to be measured directly in the sample cell.
2. A dedicated sample cell shall be used for free chlorine and another for total chlorine.
3. Rinse sample cells thoroughly between uses with at least three to five volumes of fresh clean water.
4. Lint free wipes shall be used to clean the sample cells before each measurement.
5. For accurate measurements, you MUST wait the appropriate length of time before reading the sample cell. See 10 a. & b.
6. Check for bubbles, and invert sample cell to remove. When measuring total chlorine, be sure to wipe the sample cell immediately before reading. Cold water may form condensation during the three-minute waiting period. Bubbles and condensation can result in erroneously high measurements.

Measuring Free or Total Chlorine–Mid-Range (0.05–4.00 mg/L)

1. Determine whether the PWS utilizes free or total chlorine (chloramines).
2. Rinse the glass sample cell with three to five volumes of sample water.
3. Collect 10 mL of water in clean sample cell (10 mL mark).
4. Press the POWER button to turn on the pocket colorimeter.
5. Make sure the instrument is set to mid-range (MR).
6. Remove the meter cap. Wipe any excess liquid and/or fingerprints from the sample cell with a lint-free tissue. Place the sample cell into the holder with the diamond facing the key pad. Fit the meter cap over the cell compartment to block out stray light.

7. Press the ZERO button. The display will show "- - - -" followed by "0.00." The meter has now been blanked.
8. Remove the sample cell. Add the contents of one DPD powder pillow (for free or total chlorine) to the sample cell.
9. Cap and shake the sample cell gently for 20 seconds. Tap the sample cell to remove any bubbles if present.
10. Wipe any excess liquid and/or fingerprints from the sample cell with a lint-free tissue.

Place the sample cell into the holder with the diamond facing the key pad. Fit the meter cap over the cell compartment to block out stray light.

a. For free chlorine, press the READ/ENTER button within one minute after adding the DPD free pillow. The display will show "- - - -" followed by the results in mg/L.
b. For total chlorine, wait at least 3 minutes but within six minutes after adding the DPD total pillow to read. Press the READ/ENTER button. The display will show "- - - -" followed by the results in mg/L.

11. If you obtain results that are flashing after pressing the READ/ENTER button, this indicates that the chlorine concentration is too high to read on mid-range. Proceed to the high-range procedure.

Measuring Free or Total Chlorine–High-Range (0.1–10.0 mg/L)

1. Determine whether the PWS utilizes free or total chlorine (chloramines).
2. Rinse the plastic high range sample cell with three to five volumes of sample water.
3. Collect 5 mL of water in clean sample cell (5 mL mark).
4. Press the POWER button to turn on the pocket colorimeter.
5. Make sure the instrument is set to high-range (HR).
6. Remove the meter cap. Wipe any excess liquid and/or fingerprints from the sample cell with a lint-free tissue. Place the sample cell into the holder with the triangle mark facing away from the keypad. Fit the meter cap over the cell compartment to block out stray light.

7. Press the ZERO button. The display will show "- - - -" followed by "0.0". The meter has now been blanked.
8. Remove the sample cell. Add the contents of one DPD free or total chlorine powder pillow (25 mL) to the sample cell.
9. Cap and shake the sample cell gently for 20 seconds. Tap the sample cell to remove any bubbles if present.
10. Wipe any excess liquid and/or fingerprints from the sample cell with a lint-free tissue. Place the sample cell into the holder with the triangle mark facing away from the key pad. Fit the meter cap over the cell compartment to block out stray light.

a. For free chlorine, press the READ/ENTER button within one minute after adding the DPD free pillow. The display will show "- - - -" followed by the results in mg/L.
b. For total chlorine, wait at least 3 minutes but within 6 minutes after adding the DPD total pillow to read. Press the READ/ENTER button. The display will show "- - - -" followed by the results in mg/L.

11.If you obtain results that are flashing after pressing the READ/ENTER button, this indicates that the chlorine concentration is too high to read on high range. Dilute the sample and repeat the test.

Measuring Free or Total Chlorine–High Level Sample Dilution

If the chlorine concentration is too high to read on high range (HR), then the sample must be diluted in order to obtain the correct concentration. The correct chlorine concentration is required to indicate the amount of dechlorinating agent to add to a sample.

1. Use a clean glass container to prepare your dilution. You will require distilled or deionized water as a diluent.
2. Use a clean glass sample cell (10 mL) to make measurements.
3. Measure exactly 10 mL of sample water. Pour into your clean glass container.
4. Measure exactly 10 mL of deionized/distilled water. Pour into your glass container with the sample water.
5. Mix the glass container gently by swirling. You have now made a 1:1 dilution. This should be sufficient to measure residuals up to 20 mg/L on high range.
6. Pour 5 mL of the diluted sample into a clean plastic high range sample cell.
7. Measure the sample as you would for any other sample on high range (HR). See above.
8. Once you have obtained the chlorine concentration, you will need to multiply the result by two. This is your final concentration.

Appendix I — Detection Limits and Analyte Codes

EPA drinking water regulations require certain analytes have minimum detection limits or minimum reporting levels. Table I.1 includes minimum detection limits or reporting levels for regulated or screened contaminants. It also lists other monitored contaminants that do not have required detection limits. EPA analyte codes are included as well.

Table I.1. Detection Limits and Analyte Codes for EPA Drinking Water Regulations.

Volatile Organic Contaminants Method 524.2	**MCL**		**Detection Limit** *[40 CFR §141.24(f)(17)(i)(E) & (ii)(C)]*		**Analyte Code**
	ppm (mg/L)	**ppb (µg/L)**	**ppm (mg/L)**	**ppb (µg/L)**	
Regulated					
1,1,1-Trichloroethane	0.2	200	0.0005	0.5	2981
1,1,2-Trichloroethane	0.005	5	0.0005	0.5	2985
1,1-Dichloroethylene	0.007	7	0.0005	0.5	2977
1,2,4-Trichlorobenzene	0.07	70	0.0005	0.5	2378
o-Dichlorobenzene	0.6	600	0.0005	0.5	2968
1,2-Dichloroethane	0.005	5	0.0005	0.5	2980
1,2-Dichloropropane	0.005	5	0.0005	0.5	2983
p-Dichlorobenzene	0.075	75	0.0005	0.5	2969
Benzene	0.005	5	0.0005	0.5	2990
Carbon tetrachloride	0.005	5	0.0005	0.5	2982
Chlorobenzene	0.1	100	0.0005	0.5	2989
cis-1,2-Dichloroethylene	0.07	70	0.0005	0.5	2380
Dichloromethane	0.005	5	0.0005	0.5	2964
Ethylbenzene	0.7	700	0.0005	0.5	2992
Styrene	0.1	100	0.0005	0.5	2996
Tetrachloroethylene	0.005	5	0.0005	0.5	2987
Toluene	1	1000	0.0005	0.5	2991
trans-1,2-Dichloroethylene	0.1	100	0.0005	0.5	2979
Trichloroethylene	0.005	5	0.0005	0.5	2984
Vinyl chloride	0.002	2	0.0005	0.5	2976
Xylenes (total)	10	10000	0.0005	0.5	2955
Unregulated					
1,1,1,2-Tetrachloroethane	-	-	-	-	2986
1,1,2,2-Tetrachloroethane	-	-	-	-	2988
1,1-Dichloroethane	-	-	-	-	2978
1,1-Dichloropropene	-	-	-	-	2410
1,2,3-Trichloropropane	-	-	-	-	2414
1,2,3-Trichlorobenzene	-	-	-	-	2419
1,2,4-Trimethylbenzene	-	-	-	-	2418
1,3,5-Trimethylbenzene	-	-	-	-	2424
1,3-Dichlorobenzene	-	-	-	-	2967
1,3-Dichloropropane	-	-	-	-	2412
2,2-Dichloropropane	-	-	-	-	2416

Table I.1. Detection Limits and Analyte Codes for EPA Drinking Water Regulations.

Volatile Organic Contaminants Method 524.2	**MCL**		**Detection Limit** *[40 CFR §141.24(f)(17)(i)(E) & (ii)(C)]*		**Analyte Code**
	ppm (mg/L)	**ppb (µg/L)**	**ppm (mg/L)**	**ppb (µg/L)**	
2-Butanone (MEK)	-	-	-	-	2247
2-Chlorotoluene	-	-	-	-	2965
2-Hexanone	-	-	-	-	2269
4-Chlorotoluene	-	-	-	-	2966
4-Isopropyltoluene	-	-	-	-	2030
4-Methyl-2-pentanone (MIBK)	-	-	-	-	2277/2249
Acetone	-	-	-	-	2243
Acrylonitrile	-	-	-	-	2240
Bromobenzene	-	-	-	-	2993
Bromochloromethane	-	-	-	-	2430
Bromodichloromethane	-	-	-	-	2943
Bromoform	-	-	-	-	2942
Bromomethane	-	-	-	-	2214
Carbon disulfide	-	-	-	-	1902
Chloroethane	-	-	-	-	2216
Chloroform	-	-	-	-	2941
Chloromethane	-	-	-	-	2210
cis-1,3-Dichloropropene	-	-	-	-	2228
Dibromochloromethane	-	-	-	-	2944
Dibromomethane	-	-	-	-	2408
Dichlorodifluoromethane	-	-	-	-	2212
Ethyl methacrylate	-	-	-	-	2293
Hexachlorobutadiene	-	-	-	-	2246
Iodomethane	-	-	-	-	2458
Isopropylbenzene	-	-	-	-	2994
Methyl methacrylate	-	-	-	-	2295
Methyl-t-butyl-ether (MTBE)	-	-	0.0005	0.5	2251
Naphthalene	-	-	-	-	2248
n-Butylbenzene	-	-	-	-	2422
n-Propylbenzene	-	-	-	-	2998
s-Butylbenzene	-	-	-	-	2428
t-Butylbenzene	-	-	-	-	2426
Tetrahydrofuran	-	-	-	-	2263
trans-1,3-Dichloropropene	-	-	-	-	2224
Trichlorofluoromethane	-	-	-	-	2218

Table I.1. Detection Limits and Analyte Codes for EPA Drinking Water Regulations

Synthetic Organic Contaminants [SOC Group] 5 Methods 525.2 & 508.1	**MCL**		**Detection Limit** *[40 CFR §141.24(h)(7), (10)(i) & (18)]*		**Analyte Code**
	ppm (mg/L)	**ppb (µg/L)**	**ppm (mg/L)**	**ppb (µg/L)**	
Regulated [40 CFR §141.24(g)(7), (10)(i) and (18)]					
Alachlor	0.002	2	0.0002	0.2	2051
Atrazine	0.003	3	0.0001	0.1	2050
Benzo[a]pyrene	0.0002	0.2	0.00002	0.02	2306
Chlordane	0.002	2	0.0002	0.2	2959
Di(2-ethylhexyl) adipate	0.4	400	0.0006	0.6	2035
Di(2-ethylhexyl) phthalate	0.006	6	0.0006	0.6	2039
Endrin	0.002	2	0.00001	0.01	2005
Heptachlor	0.0004	0.4	0.00004	0.04	2065
Heptachlor epoxide	0.0002	0.2	0.00002	0.02	2067
Hexachlorobenzene (HCB)	0.001	1	0.0001	0.1	2274
Hexachlorocylcopentadiene	0.05	50	0.0001	0.1	2042
Lindane (BHC-Gamma)	0.0002	0.2	0.00002	0.02	2010
Methoxychlor	0.04	40	0.0001	0.1	2015
Simazine	0.004	4	0.00007	0.07	2037
Toxaphene	0.003	3	0.001	1	2020
Screened					
Aroclor 1016	-	-	0.00008	0.08	2388
Aroclor 1221	-	-	0.02	20	2390
Aroclor 1232	-	-	0.0005	0.5	2392
Aroclor 1242	-	-	0.0003	0.3	2394
Aroclor 1248	-	-	0.0001	0.1	2396
Aroclor 1254	-	-	0.0001	0.1	2398
Aroclor 1260	-	-	0.0002	0.2	2400
Unregulated					
2-Chlorobiphenyl	-	-	-	-	2344
Acenaphthene	-	-	-	-	2261
Acenaphthylene	-	-	-	-	2260
Aldrin	-	-	-	-	2356
Anthracene	-	-	-	-	2280
Benzo[a]anthracene	-	-	-	-	2300
Benzo[b]fluoranthene	-	-	-	-	2302
Benzo[g,h,i]perylene	-	-	-	-	2312
Benzo[k]fluoranthene	-	-	-	-	2304
Bromacil	-	-	-	-	2098
Butachlor	-	-	-	-	2076
Butylbenzylphthalate	-	-	-	-	2294
Chrysene	-	-	-	-	2296
Dibenzo[a,h]anthracene	-	-	-	-	2310
Dieldrin	-	-	-	-	2070
Diethylphthalate	-	-	-	-	2284
Dimethylphthalate	-	-	-	-	2282
Di-n-butylphthalate	-	-	-	-	2290

Table I.1. Detection Limits and Analyte Codes for EPA Drinking Water Regulations

Synthetic Organic Contaminants [SOC Group] 5 Methods 525.2 & 508.1	**MCL**		**Detection Limit** *[40 CFR §141.24(h)(7), (10)(i) & (18)]*		**Analyte Code**
	ppm (mg/L)	**ppb (µg/L)**	**ppm (mg/L)**	**ppb (µg/L)**	
Fluorene	-	-	-	-	2264
Indeno[1,2,3-cd]pyrene	-	-	-	-	2308
Metolachlor	-	-	-	-	2045
Metribuzin	-	-	-	-	2595
Naphthalene	-	-	-	-	2248
Phenanthrene	-	-	-	-	2278
Propachlor	-	-	-	-	2077
Pyrene	-	-	-	-	2288
Trans-Nonachlor	-	-	-	-	2273
Trifluralin	-	-	-	-	2055
					Analyte Code
Regulated					
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.2	0.00002	0.02	2931
Ethylene dibromide (EDB)	0.00005	0.05	0.00001	0.01	2946
Unregulated					
1,2,3 Trichloropropane	-	-	-	-	2414
Synthetic Organic Contaminants - Methods 515.4 & 531.1	**MCL**		**Detection Limit** *[40 CFR §141.24(h)(7), (10)(i) & (18)]*		**Analyte Code**
	ppm (mg/L)	**ppb (µg/L)**	**ppm (mg/L)**	**ppb (µg/L)**	
Regulated					
2,4,5-TP (Silvex)	0.05	50	0.0002	0.2	2110
2,4-D	0.07	70	0.0001	0.1	2105
Aldicarb	0.003	3	0.0005	0.5	2047
Aldicarb sulfone	0.002	2	0.0008	0.8	2044
Aldicarb sulfoxide	0.004	4	0.0005	0.5	2043
Carbofuran	0.04	40	0.0009	0.9	2046
Dalapon	0.2	200	0.001	1	2031
Dinoseb	0.007	7	0.0002	0.2	2041
Oxamyl (Vydate)	0.2	200	0.002	2	2036
Pentachlorophenol	0.001	1	0.00004	0.04	2326
Picloram	0.5	500	0.0001	0.1	2040
Unregulated					
2,4,5-T	-	-	-	-	2111
2,4-DB	-	-	-	-	2106
3,5-Dichlorobenzoic acid	-	-	-	-	T002
3-Hydroxycarbofuran					2066

Table I.1. Detection Limits and Analyte Codes for EPA Drinking Water Regulations

Synthetic Organic Contaminants [SOC Group] 5 Methods 525.2 & 508.1	**MCL**		**Detection Limit** *[40 CFR §141.24(h)(7), (10)(i) & (18)]*		**Analyte Code**
	ppm (mg/L)	**ppb (µg/L)**	**ppm (mg/L)**	**ppb (µg/L)**	
Acifluorfen	-	-	-	-	T001
Baygon	-	-	-	-	2023
Bentazon	-	-	-	-	2625
Carbaryl	-	-	-	-	2021
Chloramben	-	-	-	-	2205
Dicamba	-	-	-	-	2440
Dichlorprop	-	-	-	-	2206
Methiocarb	-	-	-	-	2024
Methomyl	-	-	-	-	2022
Quinclorac	-	-	-	-	T003
Organic Contaminants—Other	**MCL**		**Detection Limit** *[40 CFR §141.24(h)(7), (10)(i) & (18)]*		**Analyte Code**
	ppm (mg/L)	**ppb (µg/L)**	**ppm (mg/L)**	**ppb (µg/L)**	
Regulated					
2,3,7,8-TCDD (Dioxin)	0.00000003	0.00003	0.000000005	0.000005	2063
Diquat	0.02	20	0.0004	0.4	2032
Endothall	0.1	100	0.009	9	2033
Glyphosate	0.7	700	0.006	6	2034
PCBs as Decachlorobiphenyl	0.0005	0.5	0.0001	0.1	2383
Disinfection Byproducts	**MCL**		**Minimum Reporting Level** *[40 CFR §141.131(b)(2)(iv)]*		**Analyte Code**
	ppm (mg/L)	**ppb (µg/L)**	**ppm (mg/L)**	**ppb (µg/L)**	
Total Haloacetic Acids	0.060	60			2456
- Monochloroacetic Acid			0.0020	2.0	2450
- Dichloroacetic Acid			0.0010	1.0	2451
- Trichloroacetic Acid			0.0010	1.0	2452
- Monobromoacetic Acid			0.0010	1.0	2453
- Dibromoacetic Acid			0.0010	1.0	2454
- Bromochloroacetic Acid			-	-	2455
Total Trihalomethanes	0.080	80			2950
- Chloroform			0.0010	1.0	2941
- Bromodichloromethane			0.0010	1.0	2943
- Dibromochloromethane			0.0010	1.0	2944
- Bromoform			0.0010	1.0	2942

Table I.1. Detection Limits and Analyte Codes for EPA Drinking Water Regulations

Radioactive Contaminants	MCL		**Detection Limit** *[40 CFR §141.25(c)(1) & (2)]*		**Analyte Code**
	ppm (mg/L)	ppb (µg/L)	**pCi/L**	**ppb (µg/L)**	
Gross alpha particle activity			3	-	
Radium 226			1	-	4020
Radium 228			1	-	4030
Tritium			1000	-	4102
Strontium-89			10	-	4172
Strontium-90			2	-	4174
Iodine-131			1	-	4264
Cesium-134			10	-	4270
Gross beta			4	-	4100
Uranium	0.30	30	-	1	4006

Appendix J — Laboratory Reporting of Analytical Results

The results of drinking water analyses conducted on the behalf of the TCEQ must be reported both electronically as a data file for migration and in a written report format for TCEQ Central Records. The electronic data for migration must be in a format compatible with the requirements of SDWIS.

Electronic Data Reporting Requirements

SDWIS requires data to be submitted in two separate tables or files: samples and results. The sample data should be submitted to TCEQ as soon as the samples are received. The field structures and requirements for each file are included in this appendix. The following tables are specific to reporting chemical compliance data (inorganics, organics, radiochemicals, and DBPs).

SDWIS accommodates both sample level and result level comments. Comments that apply to an entire sample should go in the sample record [B_SAMPLE_COMMENTS], comments that apply only to a particular analyte should go in the individual results record [B_COMMENT].

Analyte codes, units, methods and sampler names must all be validated against SDWIS or they will be rejected. Please QC data against these tables prior to submission. If fields are incorrect or missing, the files will be rejected. If an analyte or method is missing from these tables, please contact TCEQ.

All listed fields must be included in the respective tables in the order listed even if the particular field is not used.

Sample

The Sample table contains information about the sample itself, including:

- collection date/time,
- collector,
- lab and TCEQ IDs, and
- field measurements.

There is always only one record per sample.

SDWIS uses three identifiers to describe the sample location:

- facility [B_WSF_STATE_ASGN_ID],
- sample point [B_SAMPLING_POINT], and
- sample location [B_SAMPLING_LOCATION].

Both the facility and sample point are mandatory to link the sample results to the proper schedule. Sample points will vary depending on the applicable rule. Sample location is equivalent to the distribution address or sample tap location.

For delinquent accounts, submit only the sample record with "Delinquent Account" in the <B_SAMPLE_COMMENTS> field. When the account is cleared, submit the result records.

See Table J. 1 for a complete list of required fields for a Sample table.

Table J.1. SDWIS Electronic Data Reporting—Sample Table Fields

	Field name	Description	Data Type	Field Size
1	FILE_NAME	Default to "sample"	Text	6
2	B_RECORD_ID	Auto number, unique	AutoNumber	7
3	B_LAB_SAMPLE_NUM	Laboratory sample ID number	Text	20
4	B_STATE_SAMPLE_NUMBER	TCEQ ID number	Text	10
5	B_PWS_NUMBER	PWS ID number, proceed with "TX"	Text	9
6	B_REPLACEMENT_INDICATOR	"Y" if sample replaces a previously rejected sample, otherwise default to "N" If "Y" populate: field 24, 25, 37, 38	Text	1
7	B_LABORATORY_CERTIFYING_AGENCY	"STATE" if accredited by TCEQ, "FEDERAL" if accredited by EPA	Text	7
8	B_LABORATORY_CERTIFICATION_ID	Lab certification ID number; LCRA="T104704218", DSHS="T104704297" Crisp="T104704513"	Text	10
9	B_WSF_STATE_ASGN_ID	Water system facility ID; examples— entry point:"EP001," distribution:"DS01," well:"G1234567A"	Text	12
10	B_SAMPLING_POINT	Sample point—all entry points "TRT-TAP", all wells "RAW-TAP", distribution—the sample point (i.e. DBP1-01)	Text	12
11	B_SAMPLING_LOCATION	Description of sample location associated to the sample point	Text	40
12	B_SAMPLE_CATEGORY	"GE"—General chemical samples "PB"—Lead/Copper summaries	Text	2
13	B_COMPLIANCE_INDICATOR	"Y" for Yes, "N" for No All field blanks shall be set to "N"	Text	1
14	B_COLLECTION_DATE	Collection date as text in the following format-MMDDYYYY	Text	8
15	B_COLLECTION_TIME	Collection time (military) as text in the following format-HHMM	Text	4
16	B_SAMPLE_TYPE	Sample type "RT"—Routine "CO"—Confirmation "FB"—Field Blank (Set field 13 to "N") "SP"—Special	Text	2
17	B_REPEAT_LOCATION	NOT USED		
18	B_LAB_RECEIPT_DATE	Lab received date as text in the following format-MMDDYYYY	Text	8
19	B_COLLECTOR_NAME	Sample collector name	Text	40
20	B_SAMPLE_VOLUME	NOT USED		
21	B_LEAD_COPPER_SAMPLE_TYPE	NOT USED		

Table J.1. SDWIS Electronic Data Reporting—Sample Table Fields

	Field name	Description	Data Type	Field Size
22	B_SAMPLE_REJECTION_REASON	Reject code (if applicable, see Appendix F)	Text	2
23	B_COLLECTION_METHOD_CODE	NOT USED		
24	B_ORIGINAL_LAB_SAMPLE_NUMBER	Original lab sample ID number (if replacing a previously rejected sample)	Text	11
25	B_ORIGINAL_COLLECTION_DATE	Original collection date (if replacing a previously rejected sample)	Text	8
26	B_LAB_COMPOSITE_NUMBER	NOT USED		
27	B_COMPOSITE_DATE	NOT USED		
28	B_FREE_CHLORINE_RESIDUAL	Free chlorine residual	Number	Double
29	B_TOTAL_CHLORINE_RESIDUAL	Total chlorine residual	Number	Double
30	B_SAMPLE_WATER_TEMPERATURE	Water temperature	Number	2
31	B_TEMPERATURE_UNIT_MEASURE	*Water temperature units* "F"—Fahrenheit "C"—Celsius	Text	1
32	B_TURBIDITY_MEASURE	NOT USED		
33	B_PH_MEASURE	pH measurement. Mandatory for MIN and SEC samples	Number	Double
34	B_FLOW_RATE	NOT USED		
35	B_SAMPLE_PURPOSE	NOT USED		
36	B_STATE_CLASSIFICATION_CODE	IOC, VOC, SOC, RAD, DBP, WQP, LC See Appendix C	Text	3
37	B_ORIGINAL_LABORATORY_CERTIFYING_AGENCY	Original laboratory certifying agency (if replacing a previously rejected sample), see field #7		
38	B_ORIGINAL_LABORATORY_CERTIFICATION_ID	Original lab certification ID (if replacing a previously rejected sample), see field #8		
39	B_SAMPLE_COMMENTS	Comments related to the entire sample	Text	255
40	B_COLLECTION_ADDRESS	Address or description of sample site	Text	200

Result

The Result table contains the individual analyte results. There may be multiple records depending on how many constituents were analyzed in the particular water sample. A result record shall only be created if a result is available. If an entire sample is rejected and not analyzed, no result records shall be reported, only the single sample record is reported. If a field blank is collected but not analyzed, only the single sample record is reported without any results.

If individual analytes within a sample are not reported for whatever reason, you can do one of two things. Either don't create a result record for that analyte or add a reject code to the individual Result record. If you opt not to create a Result record, please make sure the sample comments reflect the reason for the missing result. Remember, if a regulated chemical result cannot be reported, the entire sample shall be rejected so it can be recollected.

Remember to carefully review analyte names to ensure you are reporting the correct analyte codes since the analyte name is no longer reported. See Table J. 2 for a complete list of required fields for a Result table.

Table J.2. SDWIS Electronic Data Reporting—Result Table Fields

	Field Name	Description	Data Type	Field Size
1	B_FILE_NAME	Default to "result"	Text	6
2	B_RECORD_ID	Auto number, unique	Auto Number	7
3	B_LAB_SAMPLE_NUM	Laboratory sample ID number	Text	20
4	B_COLLECTION_DATE	Collection date as text in the following format—MMDDYYYY	Text	8
5	B_PWS_NUMBER	PWS ID number, proceed number with "TX"	Text	9
6	B_LABORATORY_CERTIFYING_AGENCY	"STATE" if accredited by TCEQ, "FEDERAL" if accredited by EPA	Text	7
7	B_LABORATORY_CERTIFICATION_ID	Lab certification ID number; LCRA="T104704218" DSHS="T104704297" Crisp="T104704513"	Text	10
8	B_ANALYTE_CODE	EPA SDWIS analyte code	Text	4
9	B_ANALYSIS_START_DATE	Date analysis is started as text in the following format—MMDDYYYY	Text	8
10	B_ANALYSIS_START_TIME	Time analysis is started as text in the following format—HHMM	Text	4
11	B_ANALYSIS_COMPLETE_DATE	Date analysis is ended as text in the following format—MMDDYYYY	Text	8
12	B_ANALYSIS_COMPLETE_TIME	Time analysis is started as text in the following format—HHMM	Text	4
13	B_STATE_NOTIFY_DATE	Date data is reported to the TCEQ as text in the following format—MMDDYYYY	Text	8
14	B_WATER_SYSTEM_NOTIFY_DATE	Date results are reported to the PWS as text in the following format—MMDDYYYY	Text	8
15	B_DATA_QUALITY	Default to "A"	Text	1
16	B_DATA_QUALITY_REASON	NOT USED		
17	B_ANALYSIS_METHOD_CODE	Analysis method used	Text	30
18	B_VOLUME_ASSAYED	NOT USED		
19	B_LAB_REJECTION_REASON	Rejection reason specific to result (if	Text	2

Table J.2. SDWIS Electronic Data Reporting—Result Table Fields

	Field Name	Description	Data Type	Field Size
		applicable, see Appendix F)		
20	B_MICROBE_PRESENCE_INDICATOR	NOT USED		
21	B_COUNT	NOT USED		
22	B_COUNT_TYPE	NOT USED		
23	B_COUNT_UNITS	NOT USED		
24	B_LESS_THAN_INDICATOR	"Y" for yes, "N" for no	Text	1
25	B_LESS_THAN_CODE	Populate if field 24 = "Y" "MRL"—Lab Reporting Level or "MDL"—Federal Minimum Detection Limit (If applicable, see Appendix I)	Text	3
26	B_DETECTION_LEVEL	Populate with Lab Reporting Level if field 24="Y" and field 25="MRL". Do not populate if field 24="N".	Number	Double
27	B_DETECTION_LEVEL_UNIT_CODE	Populate with Lab Reporting Level Units if field 24 = "Y" and field 25="MRL." Do not populate if field 24="N."	Text	10
28	B_CONCENTRATION	Populate with Concentration if field 24 = "N"	Number	Double
29	B_CONCENTRATION_UNIT_CODE	Populate with Concentration Units if field 24="N"	Text	9
30	B_REPORTED_MEASURE	NOT USED		
31	B_REPORTED_MEASURE_COUNT_ERROR	Populate with Counting Error for radiochemical results	Number	Double
32	B_COMMENT	Comment specific to result	Text	254
33	B_STATE_SAMPLE_NUMBER	TCEQ ID number	Text	10

Printed Report Requirements

Printed analysis reports (printed paper or electronic files) must be properly coded for TCEQ Central Records. Printed analysis reports shall be submitted to TCEQ monthly after analysis is complete. These reports should be released to the respective PWSs and TCEQ concurrently along with the electronic data for migration into SDWIS.

Printed Paper Report Coding

The following information must be printed in the top right corner of printed paper analysis reports. Date shall be the collection date of the sample(s). Coding criteria must be entered in the following order with an underscore separating the data.

- Series Code: PWS
- Primary ID: County Code # and Identification # 7 digits 3 + 4 (PWS ID #)
- Document Type: AC (Analysis Chemical)
- Document Date: YYYYMMDD (Collection Date)
- Document Name: Analysis Report (with space in between words)

  Example: PWS_1234567_AC_20160101_Analysis Report

Electronic Report Coding

The same file naming convention must be used as with paper coding in order to submit electronic files to Central Records. Date shall be the collection date of the sample(s). Only PDF documents are acceptable. Files must be submitted on a CD.

Example: PWS_1234567_AC_20160101_Analysis Report.pdf

SDWIS	
Table Name	**Contents**
TSAANLYT	Analytes
TSASMN	Methods
TSAUOM	Units of Measurement
SAMPLERS	Sampler Names

Appendix K — USPS Address Abbreviations

Addresses should conform to US Postal Service (USPS) abbreviation standards when applicable.

Table K.1. USPS Address Abbreviations

Annex	ANX	Grove	GRV	Suite	STE
Apartment	APT	Heights	HTS	Terrace	TER
Avenue	AVE	Highway	HWY	Trail	TRL
Bluff	BLF	Junction	JCT	Trailer	TRLR
Boulevard	BLVD	Lane	LN	View	VW
Branch	BR	Loop	LOOP	Village	VLG
Bridge	BRG	Motorway	MTWY	West	W
Brook	BRK	Mount	MT		
Building	BLDG	Mountain	MTN		
Bypass	BYP	North	N		
Canyon	CYN	Northeast	NE		
Causeway	CSWY	Northwest	NW		
Center	CTR	Number	NO		
Circle	CIR	Parkway	PKWY		
Court	CT	Place	PL		
Cove	CV	Point	PT		
Creek	CRK	Ridge	RDG		
Crossing	XING	Road	RD		
Department	DEPT	Room	RM		
Drive	DR	Route	RTE		
East	E	Saint	SAINT		
Expressway	EXPY	South	S		
Extension	EXT	Southeast	SE		
Field	FLD	Southwest	SW		
Floor	FL	Spring	SPG		
Forest	FRST	Springs	SPGS		
Fork	FRK	Square	SQ		
Fort	FT	Station	STA		
Freeway	FWY	Street	ST		

Appendix L — Contact Information

This section lists the appropriate contact information for the TCEQ DWQ teams and the Primary Compliance Laboratory (DSHS.) See Figures L.1-L.3 for TCEQ Regional Office information and a map of the TCEQ central office campus.

Contact Information

TCEQ Drinking Water Contacts

Drinking Water Standards Section	Phone number	Email
Brittney Teakell — Drinking Water Quality Team Leader (Chemical compliance)	512-239-4392	Brittney.Teakell@tceq.texas.gov
Jessica Hoch — Drinking Water Assessment Team Leader (RTCR, Lead & Copper Programs)	512-239-2353	Jessica.Hoch@tceq.texas.gov
Calen Roome — inorganic and radiochemical compliance, laboratory approval coordinator, exceedance report tracking	512-239-6734	Calen.Roome@tceq.texas.gov
Donald Hunter — SWMOR	512-239-4661	Donald.Hunter@tceq.texas.gov
Jason Williams - Lead/Copper compliance	512-239-4660	Jason.Williams@tceq.texas.gov
Mia Gonzales — DBPs, chlorine dioxide, bromate, chlorite	512-239-6576	Mia.Gonzales@tceq.texas.gov
Christina Barrera – DLQOR, SWMOR, chlorine dioxide, bromate, chlorite	512-239-0537	Christina.Barrera@tceq.texas.gov
Gary Regner — PWSSP QA Manager	512-239-4528	Gary.Regner@tceq.texas.gov
Andrew Nidoh—Monitoring Plans	512-239-4611	Andrew.Nidoh@tceq.texas.gov
Jasmine Oliveira — coliform samples (RTCR)	512-239-6141	Jasmine.Oliveira@tceq.texas.gov
James LaManna — DWCSS Contract manager, Monitoring and Reporting violations, organic chemical compliance, field reports, scheduling	512-239-2374	James.LaManna@tceq.texas.gov

Texas Drinking Water Watch

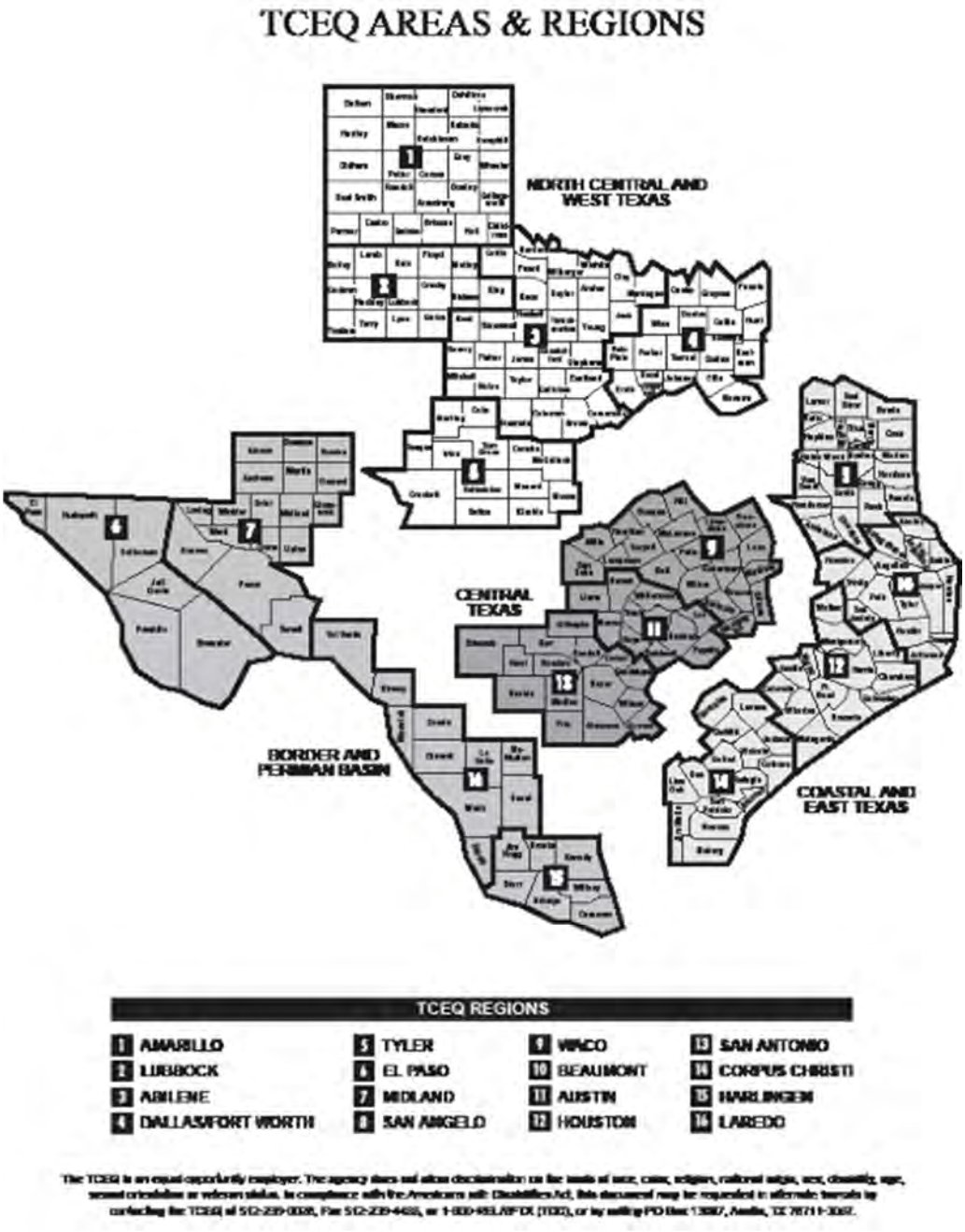
Contact information for the DWW can be found online at <http://dww2.tceq.texas.gov/DWW/>.

Primary Compliance Laboratory

The primary compliance laboratory is the DSHS in Austin.

DSHS

Laboratory Services Section Attn: Specimen Acquisition	Task	Phone
Darlene Ollinger	Check-in	512-458-7111; ext. 3476
Lisa Simpson	Quality Assurance Unit Manager	512-458-7111; ext. 2323
Karna Holquist	QA Officer	512-458-7111; ext. 3743
Monica Kingsley	Microbiology	512-776-7562
Carl Hogberg	Environmental Sciences Branch Manager	512-776-3368



Map of TCEQ Areas and Regions

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

AREA & REGIONAL OFFICES

TCEQ AREA OFFICES

BORDER AND PERMIAN BASIN
Region 6, El Paso • Region 7, Midland
Region 14, Harlingen • Region 15, Laredo
Area Director: David A. Ramirez
1804 W. Jefferson Ave. • Harlingen, TX 78550-5247
956-425-6010 • FAX: 956-412-5959

CENTRAL TEXAS
Region 8, Waco • Region 11, Austin • Region 13, San Antonio
Area Director: Susan Jablonski, P.E., MC 172
P.O. Box 13087 • Austin, TX 78711-3087
12100 Park 35 Circle • Austin, TX 78753
512-239-6731 • FAX: 512-239-4390

COASTAL AND EAST TEXAS
Region 5, Tyler • Region 10, Beaumont • Region 12, Houston • Region 14, Corpus Christi
Area Director: Kelly Keel Linsen, MC 172
P.O. Box 13087 • Austin, TX 78711-3087
12100 Park 35 Circle • Austin, TX 78753
512-239-3087 • FAX: 512-239-4390

NORTH CENTRAL AND WEST TEXAS
Region 1, Amarillo • Region 2, Lubbock • Region 3, Abilene
Region 4, Dallas/Fort Worth • Region 9, San Angelo
Area Director: Randy J. Ammons
5012 50th St., Ste. 100 • Lubbock, TX 79414-3426
806-796-7092 • FAX: 806-796-7107

TCEQ REGIONAL AND WATERMASTER OFFICES

1 – AMARILLO
Regional Director: Brad Jones
3918 Canyon Dr.
Amarillo, TX 79109-4933
806-353-9251 • FAX: 806-358-9545

2 – LUBBOCK
Regional Director: Jeff Bell
5012 50th St., Ste. 100
Lubbock, TX 79414-3426
806-796-7092 • FAX: 806-796-7107

3 – ABILENE
Regional Director: Winona Henry
1977 Industrial Blvd.
Abilene, TX 79602-7833
325-698-9674 • FAX: 325-692-6089

4 – DALLAS/FORT WORTH
Regional Director: Tony Walker
2309 Gravel Dr.
Fort Worth, TX 76118-6951
817-588-5800 • FAX: 817-588-5700

Stephenville Office
(Concentrated Animal Feeding Operations)
580 W. Lingleville Rd., Ste. D
Stephenville, TX 76401-2209
254-965-9200 or 800-687-7078

5 – TYLER
Regional Director: Leroy Biggers
2916 Teague Dr.
Tyler, TX 75701-3734
903-535-5100 • FAX: 903-595-1562

6 – EL PASO
Regional Director: Lorinda Gardner
401 E. Franklin Ave., Ste. 560
El Paso, TX 79901-1212
915-834-4949 • FAX: 915-834-4940

7 – MIDLAND
Regional Director: Lorinda Gardner
9900 W. IH-20, Ste. 100
Midland, TX 79706
432-570-1359 • FAX: 432-561-6512

8 – SAN ANGELO
Regional Director: Winona Henry
622 S. Oakes, Ste. K
San Angelo, TX 76903-7035
325-655-9479 • FAX: 325-658-5431

9 – WACO
Regional Director: David Van Soest
6801 Sanger Ave., Ste. 2500
Waco, TX 76710-7826
254-751-0335 • FAX: 254-772-9241

10 – BEAUMONT
Regional Director: Kathryn Sauceda
3870 Eastex Fwy.
Beaumont, TX 77703-1830
409-898-3838 • FAX: 409-892-2119

11 – AUSTIN
Regional Director: David Van Soest
P.O. Box 13087 • Austin, TX 78711-3087
12100 Park 35 Circle • Austin, TX 78753
512-339-2929 • FAX: 512-339-3795

12 – HOUSTON
Regional Director: Ashley K. Wadick
5425 Polk St., Ste. H
Houston, TX 77023-1452
713-767-3500 • FAX: 713-767-3520

13 – SAN ANTONIO
Regional Director: Joel Anderson
14250 Jackson Rd.
San Antonio, TX 78233-4480
210-490-3096 • FAX: 210-545-4329

14 – CORPUS CHRISTI
Regional Director: Susan Cleath
NRC Bldg., Ste. 1200
6300 Ocean Dr., Unit 5839
Corpus Christi, TX 78412-5839
361-825-3100 • FAX: 361-825-3101

15 – HARLINGEN
Regional Director: Jaime A. Garza
1804 W. Jefferson Ave.
Harlingen, TX 78550-5247
956-425-6010 • FAX: 956-412-5959

16 – LAREDO
Regional Director: Jaime A. Garza
707 E. Calton Rd., Ste. 304
Laredo, TX 78041-3887
956-791-6611 • FAX: 956-791-6716

TEXAS WATERMASTERS

Concho Watermaster
622 S. Oakes, Ste. K
San Angelo, TX 76903-7035
325-481-5939 or 800-314-4504
FAX: 325-658-5431

Rio Grande Watermaster
Main Office
1804 W. Jefferson Ave.
Harlingen, TX 78550-5247
956-430-6095 or 800-809-1219
FAX: 956-430-6002

Eagle Pass Office
P.O. Box 1135 • Eagle Pass, TX 78853-1135
1152 Ferry St., Ste. E & F
Eagle Pass, TX 78852-4357
830-773-3029 • FAX: 830-773-4103

Seville Texas Watermaster
14250 Jackson Rd.
San Antonio, TX 78233-4480
210-490-3096 or 800-733-2733
FAX: 210-545-4329

TCEQ rules, publications, agendas and highlights of commission meetings, and other environmental information are available on the TCEQ website at <www.tceq.texas.gov>. Additional region information is available at <www.tceq.texas.gov/goto/regions>.

How is our customer service? Fill out our online survey at <www.tceq.texas.gov/customersurvey>.

TCEQ Central Office/ P.O. Box 13087, Austin, Texas 78711-3087, 512-239-1000

Area and Regional Office Contact Information

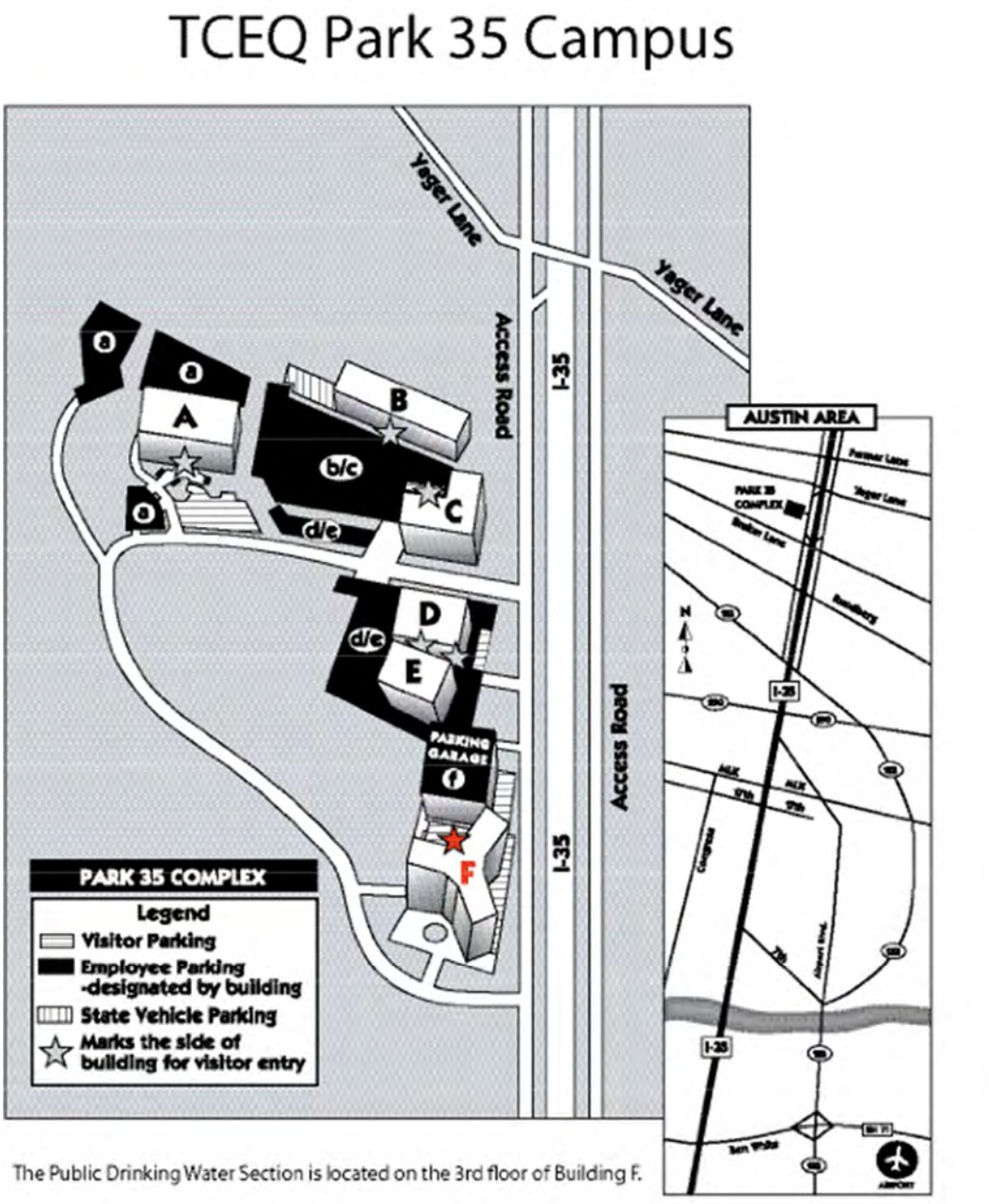


Figure L.3. Map of TCEQ Central Office Complex

APPENDIX M — Definitions and Acronyms

Definitions

The following are definitions used within this document.

Community water system (C)	A public water system that has a potential to serve at least 15 residential service connections on a year-round basis, or that serves at least 25 residents on a year-round basis.
Compliance cycle	The nine-year (calendar year) cycle during which public water systems must monitor. Each compliance cycle consists of three, three-year compliance periods.
Compliance period	A three-year (calendar year) period within a compliance cycle.
Compliance sample	A sample that a public water system is required to collect and report to the TCEQ in order to determine compliance with the Drinking Water Standards (30 TAC Subchapter F: Drinking Water Standards Governing Drinking Water Quality and Reporting Requirement for Public Water Systems).
Disinfection byproducts (DBPs)	Chemical compounds formed by the reaction of a disinfectant with the natural organic matter present in water.
Drinking water	All water distributed by any agency or individual, public or private, for the purpose of human consumption, or which may be used in the preparation of foods or beverages or for the cleaning of any utensil or article used in the course of preparation or consumption of food or beverages for human beings. The term "drinking water" also includes all water supplied for human consumption or used by any institution catering to the public.
Emergency source	A well or purchased-water source that is not used on an annual basis, but that is only maintained for use under emergency conditions, such as fire.
Entry point	Any point where treated water enters the distribution system. Entry points to the distribution system may include points where chlorinated well water, treated surface water, or water purchased from another supplier enters the distribution system.
Groundwater under the direct influence of surface water (GUI)	Any water beneath the surface of the ground with either significant occurrence of insects or other macro-organisms, algae, or large-diameter pathogens such as *Giardia lamblia* or Cryptosporidium, or significant and relatively rapid shifts in water characteristics, such as turbidity, temperature, conductivity, or pH, which closely correlate to climatological or surface water conditions.
Locational Running Annual Average (LRAA)	A running annual average calculated at each individual sample location.
Maximum contaminant level (MCL)	A primary MCL is some health-based level below which the EPA considers water safe to drink. Compliance with MCLs is often not based on the result of a single sample, but instead is calculated.

	For instance, compliance could be based on whether the average of all samples collected in a year is over the MCL. See RAA.
Non-community (transient) system (NC)	A public water system that is not a community water system and serves at least 25 persons at least 60 days out of the year, yet by its characteristics, does not meet the definition of a non-transient non-community water system.
Non-transient non-community system (NTNC)	A public water system that is not a community water system and regularly serves at least 25 of the same persons at least six months out of the year.
Process control sample	A sample that a water system collects in order to make operational decisions, but that does not have to be reported to TCEQ.
Public water system	A system that provides to the public water for human consumption through pipes or other constructed conveyances, which includes all uses described under the definition for drinking water. Such a system must have at least 15 service connections, or serve at least 25 individuals at least 60 days out of the year. This term includes: any collection, treatment, storage, and distribution facilities under the control of the operator of such system and used primarily in connection with such system; and any collection or pretreatment storage facilities not under such control that are used primarily in connection with such system. When two or more systems owned by the same entity are combined to serve more than 25 people at least 60 days out of the year, the combined operation will be considered a public water system. An individual is considered served by a water system if they live in, use as a place of employment, or work in a place where drinking water is supplied by the system.
Purchased-water system	A public water system that purchases at least some portion of its potable water from a different public water system.
Running annual average (RAA)	The average of all sample results collected in the most recent twelve months, four quarters, or one year.
Sampling site	The site at which a sample is collected.
Seasonal water source	A well, surface source, or purchased-water source that is used on a regular basis, usually annually, to meet peak demand.
Wholesaler	A public water system that sells water to another public water system.

Acronyms

The following are acronyms for terms and names used within this document.

ACRONYM	DEFINITION
AC	asbestos cement (pipe)
BC	bad contact
BCAA	bromochloroacetic acid
BDL	below detection limit
C	community (water system)
COC	chain of custody
CCI	Comprehensive Compliance Inspection
CCL	contaminant candidate list
CCR	Consumer Confidence Report
CDBAA	chlorodibromoacetic acid
CDS	combined distribution system
CFR	Code of Federal Regulations
CWS	community water system
D	demand
DBCP	1,2-dibromo-3-chloropropane
DBP	disinfection byproduct
DBP1	Stage 1 Disinfection Byproduct Rule
DBP2	Stage 2 Disinfection Byproduct Rule
DCAA	dichloroacetic acid
DI	deionized
DOC	dissolved organic carbon
DPD	N,N-diethyl-p-phenylenediamine
DWCSS	Drinking Water Compliance Sampling Services
DWSG	Drinking Water Sampling Guide
DWQ	Drinking Water Quality (Program)
DWW	Drinking Water Watch
E	emergency
EDB	Ethylene dibromide
EP	entry point
EPA	Environmental Protection Agency
EST	elevated storage tank
FMT	Financial, Managerial and Technical (Assistance)
GAC	granular activated carbon
GC	gas chromatograph
GST	ground storage tank
GUI	groundwater under the direct influence of surface water
HAA	haloacetic acid
HCO_3	bicarbonate
HPC	heterotrophic plate count
HR	high range
IDSE	Initial Distribution System Evaluation
ISD	Independent School District
L	liter

ACRONYM	DEFINITION
LCRA	Lower Colorado River Authority
LRAA	locational running annual average
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
MDL	method detection limit
MG	milligram, aka ppm
MOR	monthly operating report
MPA	microscopic particulate analysis, aka filtrate sample
MRDL	maximum residual disinfectant limit
MRDLG	maximum disinfectant residual limit goal
MTBE	methyl tert-butyl ether, a gasoline additive
MUD	Municipal Utility District
MWD	Municipal Water District
NO_2	nitrite
NO_3	nitrate
NOM	natural organic matter
NPDWR	National Primary Drinking Water Regulation
NRC	no returned call
NTNC	non-transient, non-community (water system)
NTU	Nephelometric turbidity unit
O	operational
PAC	powdered activated carbon
PE	professional engineer or performance evaluation
POE	point of entry, aka entry point
PPB	parts per billion, aka µg/L
PPM	parts per million, aka mg/L
PQL	practical quantitation limit
PSI	pounds per square inch (pressure)
PWS	Public Water System
PWSSP	Public Water System Supervision Program
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
QMP	Quality Management Plan
RAA	running annual average
RG	regulatory guidance
RO	reverse osmosis
RT	retention time
SCL	secondary constituent level
SDS	Safety Data Sheets
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
SM	standard method
SOC	synthetic organic chemical
SUVA	specific ultraviolet absorbance
SW	surface water

ACRONYM	DEFINITION
SWTP	surface water treatment plant
TAC	Texas Administrative Code
TBAA	tribromoacetic acid
TCAA	trichloroacetic acid
TCEQ	Texas Commission on Environmental Quality
TDS	total dissolved solids
TDSHS	Texas Department of State Health Services
TEEX	Texas Engineering Extension Service
THM	trihalomethanes
TNC	transient non-community (water system)
TOC	total organic carbon
TTHM	total trihalomethanes
UCMR	Unregulated Contaminant Monitoring Regulation
UV	ultraviolet
UV_{254}	absorbance of ultraviolet light at a wavelength of 254 nanometers
VOC	volatile organic chemical
WCID	Water Control and Improvement District
WSC	Water Supply Corporation
WSD	Water Supply Division

APPENDIX N — Texas Drinking Water Watch

The State of Texas uses the EPA developed and maintained SDWIS to manage PWS data and to conduct compliance. The public has access to this data through the DWW website at <http://dww2.tceq.state.tx.us/DWW/>.

This website offers live access to PWS data where the following information is available.

1. **Water System Detail**–General water system data including:
   - County Served
   - Population
   - System Type–Community, non-community (transient), non-transient non-community, non-public
   - Primary Source Type–ground water or surface water
   - System Status–Active or inactive
   - Activity Date
   - System Recognition–Approved or superior
   - Water System Contacts
   - Sources of Water
   - Buyers of Water
   - Annual Operating Period
   - Service Connections and Area
   - Indicators
2. **Water System Facilities**–Facilities include: sources (wells, surface water intakes), pump facilities, entry points, storage tanks and plants. Locational data is included for sources and will be available for entry points in a future update.
3. **Source Water Assessment Results**–If the system has had a source water assessment completed, the summary will be displayed.
4. **Sample Points**–Locations of sample points for monitoring at sources, entry points and in distribution.
5. **Sample Schedules/FANLs/Plans**–Sample schedules for chemical and bacteriological monitoring required by the water system.
6. **Violations**–A listing of any violations assessed against the water system.
7. **Enforcement Actions**–A listing of any actions assessed against the water system.
8. **Assistance Actions**–A listing of any assistance actions provided to the water system.\
9. **Compliance Schedules**–Compliance schedules for deliverables the water system must meet; for example: Consumer Confidence Report (CCR).
10. **TOC/Alkalinity Results**–Total Organic Carbon (TOC) and alkalinity results.
11. **LRAA (TTHM/HAA5)**–Locational running annual averages (LRAA) for

disinfection byproduct compliance.

12. **TCR Sample Results**–Results of total coliform rule (TCR) monitoring.
13. **Recent Positive TCR Results**–A list of recent positive TCR results (if applicable).
14. **Other Chemical Results**–A list of chemical sample results by laboratory sample ID number. Field results and collection information are accessible through individual sample results.
15. **Chemical Results:** Sort by: Name or Code–Chemical sample results history by individual chemical; sorted by name or analyte code.
16. **Recent Non-TCR Sample Results**–A listing of the most recently collected chemical sample results.
17. **TTHM/HAA5 Summaries**–Disinfection byproduct summaries.
18. **PBCU Summaries**–Lead and copper sample summaries and links to individual results.
19. **Chlorine Summaries**–Disinfectant residual summaries.
20. **Turbidity Summaries**–Turbidity sampling summaries (surface water treatment).
21. **TCR Sample Summaries**–A summary of TCR sample results.

Appendix O — Google Earth™ KML Files

TCEQ maintains Keyhole Markup Language (KML) files of sample locations. A KML file is an XML based file that is used to display geographic data in applications such as Google Earth™, or Google Maps™. Five files are maintained by TCEQ and are updated regularly (see Table O.1).

Table O.1. List of Google Earth Sample Location Files Maintained by TCEQ.

Type	File Name	Icon File Name
Entry Points	EP_GPS.kml	ep.png
Inactive Entry Points	EP_GPS_INACTIVE.kml	inactive_ep.png
Active Wells	WELL_GPS.kml	well.png
Inactive Wells	INACTIVE_WELL_GPS.kml	inactive_well.png
Surface Water Intakes	INTAKE_GPS.kml	intake.png

KML files can be used to aid in determining correct sample locations and in planning sampling routes. All entry points, wells and intakes are plotted on the map.

Using KML Files

You must have Google Earth™ loaded on your computer to utilize KML files. The standard desktop/notebook version available for free is acceptable for general use. The files are too large for use with the mobile version of this software (phone/tablet).

Double click on the file (.kml) and it should automatically load into Google Earth™. Alternatively, you can open them via the File, Open menu [Ctrl+O] in Google Earth™. The map icons (.png) need to be placed in a folder named GPS on your computer's C: drive in order to display correctly. [C:\GPS\]

Once the KML and icon files have been properly loaded the place marks will appear in Google Earth™. To improve performance, you will need to zoom in to at least a county view before the icons will become visible. Each place mark will also be accompanied by the source code or PWS ID and entry point number. Clicking on an icon will display information regarding the facility as well as a link to the PWS in DWW.

All place marks will be listed under "Places" in the left-hand panel of Google Earth™. Double clicking on the links will zoom the map to that particular location.