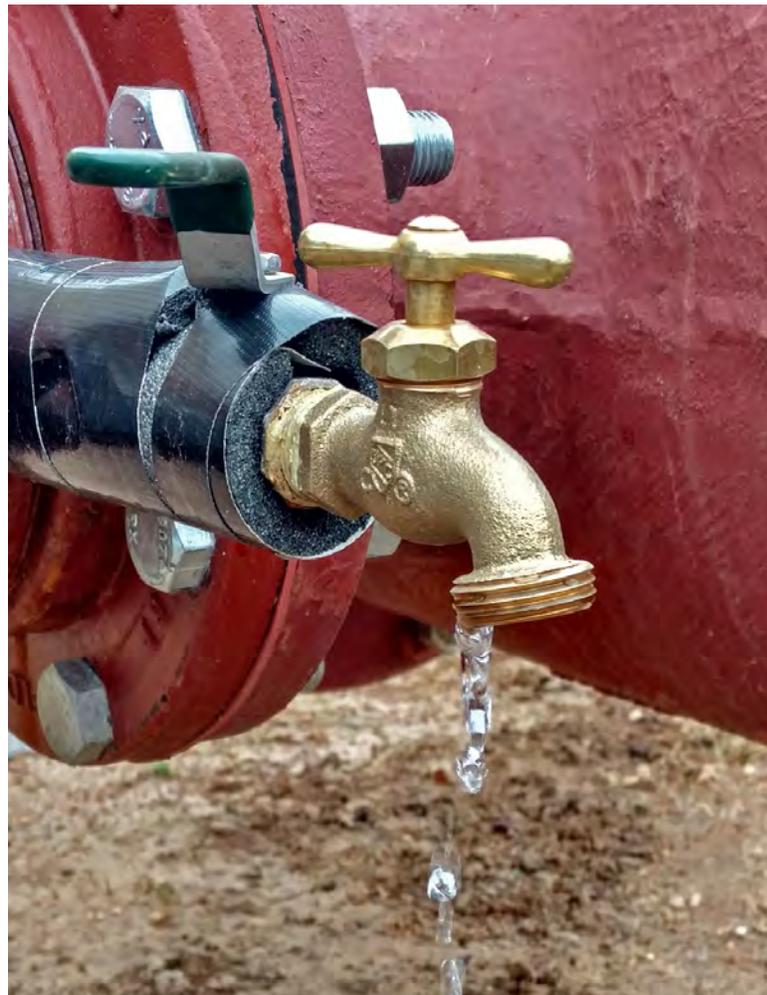




DRINKING WATER SAMPLING GUIDE



2016 EDITION

Public Drinking Water Section

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Drinking Water Sampling Guide

2016 Edition



Public Drinking Water Section
Drinking Water Quality Program

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Section

1

Introduction

Drinking water sampling is required to determine whether harmful chemicals or microbes are present in the public's drinking water supply. Good analytical results start with good sample collection. The results of sample analysis are used to determine regulatory compliance with the drinking water standards {Title 30 Texas Administrative Code (TAC) Chapter 290, Subchapter F}, therefore 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 and transportation of drinking water samples to the laboratory for analysis. The procedures outlined in this guide are based on state and federal rules and regulations.

Specific sampling guidelines and techniques contained in this guide are based on the Environmental Protection Agency's (EPA) approved methods and the EPA's [Manual for the Certification of Laboratories Analyzing Drinking Water](#). These practices provide the minimum level of quality assurance necessary to ensure that the samples analyzed continue to accurately reflect the quality of the raw, treated and distributed water supply. They comprise "front-end" quality assurance activities and are intended to supplement the analytical method quality assurance and control activities already in place.

Intended Audience

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

- Samplers under contract with the TCEQ (This includes any current primary contractor and all of their sub-contractors performing work under the Drinking Water Compliance Sampling Contract).
- Regional investigators (references to "region" staff in this guide refer to investigators from the TCEQ's 16 Regional Offices), or other TCEQ staff.

This guide is not intended for individuals other than TCEQ staff, samplers under contract with TCEQ, or TCEQ's compliance laboratories, for any purpose other than reference. All chemical compliance samples must be collected by the TCEQ's Drinking Water Compliance Sampling Contractor and analyzed by the TCEQ's designated compliance laboratories; there are NO exceptions.

Quality Assurance and Quality Control

Quality assurance (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.

Each budgeted activity is required by the EPA to have a Quality Management Plan (QMP) in order to receive funding. The TCEQ has an agency-wide QMP, and the Water Supply Division has a Quality Assurance Project Plan (QAPP) for the Public Water Supply Supervision (PWSS) Program. These documents are updated annually or according to EPA requirements. They are maintained, reviewed and approved by TCEQ QA officers, various TCEQ staff, laboratories, and by the EPA QA officers. All data collection (including sample collection and analysis) is subject to EPA quality assurance requirements. All sample collectors should be aware of the significance of these documents. This guide is included as part of the PWSS Program QAPP; all contract sample collectors and compliance laboratories must adhere to this guide.



Elevated storage tank (EST)

Logs used to record accuracy or calibration checks should be maintained for the duration of the contract. This includes logs for checking the accuracy and consistency of chlorine residual colorimeters, pH meter calibration logs, thermometer accuracy logs, and refrigerator temperature logs, along with all supporting documentation such as Certificates of Analysis, lot numbers and dates of use, etc.

Why Have Standard Sample Collection and Handling Procedures?

Chain-of-custody records and standard procedures for sample collection, labeling, storage and transportation to the laboratory help to ensure the integrity of the samples and the resulting analytical data. Standard procedures and best practices facilitate uniform compliance monitoring throughout the state, and ensure the collection and monitoring of comparable information for each sample. Such 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 public water system compliance and inventory data.

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

Public health protection is ultimately dependent upon proper sampling techniques and, therefore, sample collection should not be taken lightly. Proper sampling requires planning, knowledge of the analytical methods used, familiarity with the rules and regulations, and thorough training. This guide is intended to answer most of the questions relating to drinking water sampling at public water systems (PWSs). Regulations as well as process changes do occur; therefore, you should always contact the Public Drinking Water Section (PDWS) of the Water Supply Division (WSD) at (512) 239-4691 for the most recent information and version of this guide.

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

Contract Samplers

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

Samplers should be familiar with state regulations covered in Title 30 of the Texas Administrative Code (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 document is included as part of the PWSS Program QAPP and the Drinking Water Compliance Sampling Contract.



Collecting an SOC5 sample

Section

2

Drinking Water Monitoring

All public water systems 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 water system, such as disinfectant residual monitoring, lead and copper tap sampling, and bacteriological (coliform) sampling. Other sampling is performed by TCEQ regional staff or sampling contractors. Routine chemical compliance samples include all sampling that is required by 30 TAC §290.106—relating to Inorganic Chemicals, §290.107—relating to Organic Chemicals, §290.115—relating to Disinfection Byproducts (other than Chlorite and Bromate), and §290.108—relating to Radionuclides (other than Radon).

Monitored vs. Regulated Chemicals

There are many chemicals that are 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, because some analytical techniques will provide data for these additional chemicals without increasing the cost of analysis. Additionally, there are volatile organic chemicals (VOCs) and synthetic organic chemicals (SOCs) that are analyzed but for which there are no associated health-based maximum contaminant levels (MCLs). For this reason, the chemicals covered in this manual are referred to as “monitored chemicals” rather than “regulated chemicals.” For a complete list of regulated chemicals, approved drinking water methods, and MCLs, see **Appendix D**.



Applicability

Title 30 of the TAC, Section 290, Subchapter F, lists the monitoring requirements for each type of public water system. The table below outlines what type of monitoring is required for each type of system.

Monitoring Requirements for PWSs

		System Type*		
Monitoring Type	Rule	C	NTNC	NC
Inorganic Chemicals	§290.106	X	X	X†
Organic Chemicals	§290.107	X	X	
Radionuclides	§290.108	X		
Microbial Contaminants	§290.109	X	X	X
Disinfection Residual	§290.110	X	X	X
Disinfection Byproducts	§290.115	X	X	
Lead / Copper	§290.117	X	X	
Secondary Constituents	§290.118	X	X	X
Sodium	40 CFR §141.41	X		

* C - Community, NTNC - Non-transient Non-Community, NC - Non-Community (Transient)

† Nitrate and Nitrite only

Section

3

Sampling Locations

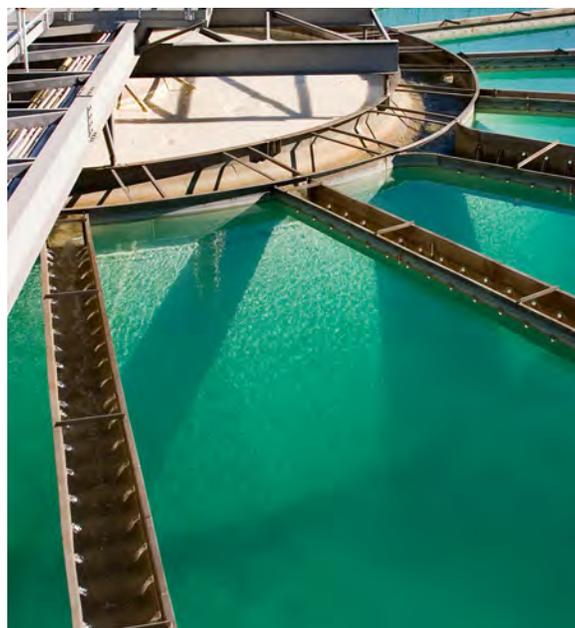
All PWSs are required to determine the locations of acceptable sampling sites and record the locations in a Monitoring Plan [30 TAC §290.121], provide good sampling taps at those locations, and provide access to the TCEQ or the TCEQ’s contracted sample collectors. The TCEQ’s Regional Investigators visit PWSs and review their compliance with these requirements. The PWS is responsible for setting their sample sites, not the samplers or the TCEQ. TCEQ Central Office staff in the Public Drinking Water Section (PDWS) schedule samples based on a system’s water sources, entry points, population, susceptibility and any previous analytical results. Different types of sample locations will have different types of scheduling.

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

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

Distribution samples are collected within the water system’s service area. Sample locations must be representative of the conditions in the distribution system. Water from the distribution system is monitored for asbestos, disinfection byproducts (DBPs), total coliform, disinfectant level, and lead and copper.

Detailed guidance for determining appropriate sample locations is provided to water system 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, systems status, sample sites, contact information and other attributes of a PWS is called ‘PWS Inventory’ data. This data is available to the public through the Drinking Water Watch website. The web address is: <http://dww2.tceq.texas.gov/DWW/>



Upflow clarifier at a surface water treatment plant (SWTP)

SDWIS - Sampling Locations		
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)
Facility Name	WSF_NAME	The description or location of the facility. For wells, this is the PWS’s designation for the well; for distribution this is defaulted to “DISTRIBUTION SYSTEM”; for entry points this should be the location or address of the entry point.
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”, distribution sample points will vary (i.e. DPB1-01).
Sample Location	B_SAMPLING_LOCATION	The location of a sampling point. For entry points this will be the sample tap description, for wells it will always be “Well Head”, for distribution it will be the sample site address. If the sample location is not populated on the PWS water analysis form, it should be filled in. A missing sample location will result in sample rejection.

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 should not be covered by vegetation, should be in an area that is safely and easily accessible, is clean, is pointing down, has good clearance, is easy to open, and has no hoses or tubing connected to it. It is appropriate to write a field report regarding unsuitable sampling taps. The tap should be easily accessible and ready for use before the sampler arrives.

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

A service pump in a well house that is not using food-grade oil is not a good sample site. One can tell that such a condition exists by smell and by the presence of non-food-grade oil containers in the area. The fumes from non-food-grade oil can be picked up as contaminants in a VOC sample. Additionally, volatile chemicals of any type, such as gasoline, paint or solvents, should not be used or stored near a sample site or contamination may occur. If these conditions exist, an alternative sampling site should be used.



Sample tap on a well head

Source Water Sampling Locations

Source water samples for interim approval of a well are collected by the PWS or developer when a well is first completed. These interim approval samples should be analyzed at a TCEQ certified lab of the PWS's choice. A list of certified labs is available on the TCEQ website. The results must then be submitted to the Plan Review Team before a well is approved for interim use. After a well is granted interim approval, the water system must contact the Drinking Water Quality Team to schedule final approval samples. These samples will be collected by the TCEQ's contractor and forwarded for analysis to one of the TCEQ-certified 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 sources of contamination, the well will be scheduled for additional sampling.

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

Identifying Sources

Source (Facility ID)	Facility Name	Sample Point	Tap Location
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 well.	Always "RAW-TAP" for sources.	A description of the sample tap at the source. Always "WELL HEAD" for wells.
EXAMPLE			
G1230001A	Well 1, Turkey Rd	RAW-TAP	WELL HEAD

Suitable Sites for Source Water Sampling

A suitable sample site for source water should be before any treatment takes place and before any blending. For groundwater, sampling should 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)]. 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 intake to the treatment plant.

Examples of Well Sampling Locations



Entry Point Sampling Locations

Most monitored chemical samples are collected at the point where treated water enters the distribution system, called the **entry point (EP)**. Regulations require that a suitable sampling tap shall be provided at a point representing water entering the distribution system at every entry point [30 TAC §290.42(b)(6), (c)(5), (d)(14)]. Treated water may enter the system from wells, springs, surface water treatment plants that the system owns, from a purchased water source, or may be a blend of sources.

Purchased Water vs. Owned Water

Purchased drinking water is assigned an entry point number whether it has only one source, or has been blended with another source. Current TCEQ policy is not to routinely collect samples other than nitrate and nitrite at the entry points where only treated purchased water enters a distribution system. [§290.102(f)] The TCEQ may, however, require purchased water entry points to be sampled if it deems it necessary, or if there is reason to suspect a change in water quality from the wholesaler to the purchaser. Purchased water is normally sampled only in the system where the water is produced. However, a system that purchases water that exceeds an MCL will be required to monitor at the take point in order to determine compliance. If purchased water (usually treated surface water) is blended with owned water (typically ground water) through the same entry point then it should be scheduled for sampling according to the monitoring type of the owned water (typically ground water).



Entry point sample tap on a ground storage tank (GST)



Entry point sample tap on an above ground water line

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".

Suitable Sites for Entry Point Sampling

The entry point sample site should be **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 surface water plants, the entry point sample site is often a faucet in the wet lab that provides fully treated water from the clear well. A suitable entry point sample site for ground water is typically a hose bibb off the discharge side of the service pump. Another suitable tap location would be off of the ground storage tank (GST), elevated storage tank (EST) or 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 educated on the entry point concept. See **Appendix E** for a list of commonly used abbreviations for sample tap locations.

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

Entry points are identified in TCEQ's data with a code (facility ID), facility name, sample point and tap location. The DWQ Program has added the facility name and tap location to the electronic sampling schedule and this information is printed on the contractor-generated sample submission forms to help identify entry points. Latitude and longitude coordinates are also provided for the entry point location if available. The DWQ 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 [i.e.: EPO01 (facility ID); Jones Plant, 123 Main St, Jasper (facility name), GST (tap location)].

The monitoring plan requirements may help clarify this issue. Every PWS is required to have a Monitoring Plan that includes a list of entry points (30 TAC §290.121(a)).

Identifying Entry Points

Entry Point (Facility ID)	Facility Name	Sample Point	Tap Location
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.
EXAMPLE			
EP001	123 Main St, Llano	TRT-TAP	GST

Inactive Entry Points

Entry points are numbered sequentially and numbers are never reused. For example: A system has two entry points, EP001 and EP002, and entry point EP001 becomes inactive. Later, when a new entry point is added, it would be numbered EP003. EP001 can not be reused. This is because historical sampling data has been associated to this facility.

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

Entry points whose availability is permanent or seasonal are routinely sampled; emergency entry points 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 entry points. 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 activity status of entry points.

Purchased Water Entry Point Locations

Identifying a purchased water entry point (take point) can be challenging. It should be located at or near the point where the purchased water enters the distribution system of the PWS 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, entry point samples should be collected from the hauling tank if it is filled from multiple or varying locations. If the tank is **always** filled from the same source, the source can be utilized.

For water bottlers, entry point samples should be collected from water that will go directly into bottles, or from a bottle of finished product.



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.

If all entry point descriptions are not accurately described on the printed sampling schedule, a field report should be completed and submitted to the DWQ Program so that accurate information can be listed in the future. If the sample location is missing on the water analysis form/tablet, it should be filled in by the sampler once the location is determined.



Drinking water sampling and monitoring ensures that the state's water supply is safe and free from contamination.

Distribution System Sampling Locations

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

Disinfection By-products – Formation and History

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



Total organic carbon in the presence of chlorine or monochloramine forms trihalomethanes and haloacetic acids. This reaction also forms additional by-products such as nitrosamines; however, THMs and HAAs are the main groups and the only ones 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 HAAs than chloramines;
- concentration of total organic carbon (TOC) – more TOC causes more DBP formation, generally speaking there is significantly more TOC in surface water than in ground water;
- pH – different impacts for different disinfectants;
- biological activity – HAAs may be biodegraded, but THMs are not;
- bromide concentration – bromide interacts with chlorine or chloramine and causes rapid formation of relatively high levels of THMs and HAAs (some areas of Texas have high levels of bromide).

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

The Stage 1 Disinfection Byproduct Rule (DBP1) was adopted by the EPA in 1998. It changed the MCL for total THMs (TTHM) to 0.080 mg/L (80 µg/L or ppb) and extended coverage to all C and NTNC systems. Previously, the MCL of 0.10 mg/L (100 µg/L or ppb) only applied to systems with a population over 10,000 people. It also added the MCL of 0.060 mg/L (60 µg/L or ppb) for HAAs (group of 5, HAA5). The Stage 2 Disinfection By-product Rule (DBP2) was adopted by the EPA on January 4, 2006. It maintains the same MCLs, but changes the sampling requirements and the way that compliance with the MCL is determined. MCL compliance is now based on locational running annual averages (LRAAs) at each site, instead of based on 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” restarts when DBP2 monitoring begins.

Stage 2 Disinfection By-product Rule (DBP2) Monitoring Locations

For DBP2 monitoring, the number of sample sites is based on the size (population) of the system and the predominant water type. This is a change from the DBP1 rule which required the identification of new or additional monitoring locations. 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 done 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 pre-printed on the PWS Water Analysis Form. PWSs may request changes to sites through e-mail to the DBP Rule Coordinator or through the DBP@tceq.texas.gov e-mail box.

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 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 also state "Minor change".
3. Sampler should send an e-mail to DBP@tceq.texas.gov. If it is a change made out 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 #,
 - the original site location (DBP2-XX XXXX) ,
 - the corrected site location (DBP2-XX XXXX),
 - a very brief reason for the change.
4. Once the TCEQ staff member knows of the change they will update the TCEQ sample schedule so that the change will appear on the pre-printed forms for the next sample event.
5. Remind the system to update their monitoring plan.

Significant Changes

Significantly changing DBP2 sites requires 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. 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 therefore present the greatest risk to people. 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 alternate between locations with the highest TTHM and HAA5 levels.

To make significant changes to sample locations a system should gather, if available, the following resources which may be useful to identify potential locations:

- Distribution system map, diagram, or schematic
- Water quality data, including source water data, DBP1 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, water quality and system operations data, a water system 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 maintaining disinfectant residuals
- Low but detectable residual levels
- High historical levels

Systems should note that unlike TTHMs, HAA5s can biodegrade and, if they believe biodegradation is occurring, should select sample locations between average and max water age 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). Systems should 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 system to use an entry point as a DBP sample location. If a sampler encounters such a case, they should contact the TCEQ for guidance or complete a field report.

For significant DBP sample location changes please:

1. Contact TCEQ to approve the change by having the system send an e-mail to DBP@tceq.texas.gov. If it is a change made out in the field, call (512-239-4691) and ask to speak to a DBP Program coordinator. The system should be prepared to provide:
 - PWS ID;
 - the old and new sample locations; and
 - the reason for the change.
2. If the change is approved verbally by TCEQ:
 - 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.
 - On the pre-printed PWS Water Analysis Form (or electronic equivalent), in the “Comments” section write a brief reason for the change and also write “change approved by [staff name] at TCEQ”.

Summary

1. Whether you (or the system) seeks approval from TCEQ to change the sites or not, 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 the schedule for future sampling events.
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 e-mail approval from TCEQ staff to make the DBP sample site change 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.

Request to Postpone DBP sampling

As a courtesy, TCEQ will postpone DBP sampling if a system makes a temporary change to treatment to address water quality issues. However, the system 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 Public Drinking Water Staff by letter or by e-mail 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 disinfection by-product (DBP) sampling. In other words, DBP sampling should accurately represent standard operating procedure.
3. As a courtesy, systems should notify their customers before the change occurs. The following should be addressed:
 - 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 water system 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. Water systems should monitor their distribution system for both free and total chlorine until levels stabilize to determine where odors are most likely to be noticeable.

Reverting to free chlorine or shocking for a period longer than 30 days will be considered normal operating conditions, and no delay in sampling will be permitted. Only TTHM or HAA5 sampling may be delayed because of a change in disinfectant. **No other type of sampling should 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 eroding from geologic formations. There are known deposits of asbestos containing minerals in Blanco, Culberson, Gillespie, Hudspeth and Llano counties. A water system should choose sample sites that are most susceptible to contamination.

If a system knows they have AC pipe, they should select site(s) after that line of pipe. If a system is unsure about the existence of AC pipe within their distribution system, they should 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.

No community or non-transient non-community water system is exempt from asbestos monitoring; they must monitor at least once every nine years. If a system has a question about asbestos monitoring they should contact the Public Drinking Water Program at (512) 239-4691.

Distribution Sites for Water Bottlers and Haulers

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

For water bottlers, distribution samples should 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 entry points, wells and surface water intakes. KML files for use in Google Earth may be obtained from the Public Drinking Water Section 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 Drinking Water Watch.

Section 4 Sampling Frequency

4

This section presents a general discussion of how frequently chemical samples must be collected, based on the regulations and policies of the TCEQ. The various types of samples are discussed, and instruction is provided on how often the various types of samples should be collected.

All systems are required to do some level of routine monitoring. Monitoring frequency depends on the type of system and:

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

Systems may be required to do more monitoring if their water source has been determined to be vulnerable to contamination, they have had a detection of a regulated chemical, or if they exceed a trigger level.

DEFINITIONS - Types of Water Systems	
<p>Community C</p>	<p>A public water system 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. – <i>Examples of community systems include: municipalities or mobile home parks</i></p>
<p>Non-transient non-community NTNC</p>	<p>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 – <i>Examples of NTNCs include: employers, large businesses with their own wells, day cares, and schools.</i></p>
<p>Non-community (Transient) NC</p>	<p>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. – <i>Examples of NCs include: restaurants, camps, or roadside parks</i></p>

Customer complaint samples are usually collected by the regional offices. However, on occasion, the sampling contractor may be asked to collect these samples. Samples that are collected as part of investigative activities, or as the result of a customer complaint, are considered special samples. The decision to collect samples of this type is usually made by the TCEQ Central or Regional Offices. See priority sample types under **Section 5**.

In many cases, the laboratory fees for these samples are paid by TCEQ; indicated by “TCEQ-PAY” written on the PWS Water Analysis Form. All “TCEQ PAY” samples **MUST** go to the DSHS laboratory for analysis. See **Section 10**.

Entry Point Sampling for Organic and Inorganic Chemicals

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”. Much, but not all, of the EPA-required sampling follows this standard monitoring framework. TCEQ monitoring periods and cycles may differ from EPA, however, frequencies will be identical.

EPA Standard Monitoring Framework Monitoring Periods

9-year cycle									9-year cycle								
3-year period																	
2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
6-year period						6-year period											

*Some systems may be eligible for reduced monitoring once every 6 years.

Each entry point is scheduled according to the monitoring type of water that the system owns, not purchases (see following table). If a system blends its own water with purchased water, the monitored 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).

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 entry-point monitoring follows the EPA standard monitoring framework. The required type and frequency of monitoring by system type is outlined below.

Required Routine Monitoring Frequency for Monitored Chemicals

System Type	Owned Ground Water Entry Point Monitoring Type (G)	Owned Surface Water Entry Point Monitoring Type (S, U)
Community -C	Minerals, Metals, Cyanide and Synthetic Organic Chemicals (SOC) once every three years. Volatile Organic Chemicals (VOC) and nitrate annually. Radionuclides once every three, six or nine years depending on sample results.	Minerals, Metals, Cyanide, VOCs and nitrate annually
		SOCs once every three years.
		Radionuclides once every three, six or nine years depending on sample results.
Non-transient/ Non-community - NTNC	Minerals, Metals, Cyanide and SOC once every three years. VOCs and nitrate annually.	Minerals, Metals, Cyanide, VOCs and Nitrate Annually
		SOCs once every three years.
	No Radionuclides	No Radionuclides
Non-community (Transient) -NC	Secondaries once every three years. Nitrate every year.	Secondaries and nitrate annually.

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

Decreased Organic Chemical Monitoring

EPA requires states to have an approved waiver program that allows decreased monitoring. TCEQ does not currently have a 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 source is vulnerable. All new surface water sources should be monitored for these contaminants to determine vulnerability.

If an aroclor is detected when screened as part of the SOC₅ group, then a confirmation sample must be ordered using EPA Method 508A.

Increased Sampling

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 source of water, the system may be sampled for confirmation for two or 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.

Nitrate/Nitrite Sampling

All public water systems are required to monitor for nitrate on an annual basis. For guidelines on normal nitrate monitoring frequency see §290.106(c)(6). High nitrate or nitrite levels may 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 compliance cycle.

Increased Monitoring for Individual Analytes

The annual schedule also includes additional monitoring for individual compounds such as arsenic, fluoride, barium, radionuclides, etc. If levels of a chemical are higher than certain triggers, sampling will be increased for that specific chemical to quarterly so that the chemical can be closely monitored. If the level of a chemical exceeds its MCL, the system will remain on quarterly monitoring until it can be established that both the level of the chemical is reliably and consistently below the MCL, and the TCEQ has returned the system to compliance status.

Purchased Water Sampling

An entry point that is fed **only** by *treated* purchased water will only routinely be required to sample for nitrate/nitrite at the entry point. It is assumed that the 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 is receiving water that exceeds an MCL for a regulated chemical it will also be sampled for that chemical in order to calculate compliance. A water system that only uses treated purchased water will still be required to sample in the distribution system for asbestos, disinfection byproducts and lead and copper, depending on the classification of the system. Water systems purchasing raw water will be required to do all routine sampling after treatment depending on system classification.

DBP2: Disinfection Byproduct Monitoring Frequency

All community and non-transient/non-community systems are required to conduct monitoring for total trihalomethanes and haloacetic acids [§290.115(a)]. DBP1 Compliance monitoring ended for all systems on September 30, 2013.

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. Systems were scheduled to begin compliance monitoring based on the size of the largest systems in their CDS.

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



Pressure Tank (PT)

Routine and Reduced DBP2 Monitoring

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 2 locations, 1@High TTHM, 1@high HAA5	1 or 2	AN	Monitoring may not be reduced	
	500 - 3,300	1 or 2	QTR	1 dual @ 1 location if high TTHM and HAA5 coincide 2 locations, 1@High TTHM, 1@high HAA5	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	
	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	
	Systems put on increased quarterly monitoring must collect dual sample sets at all locations							

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 can be naturally occurring, and some systems may use **asbestos cement pipe (AC)** within their distribution systems. Therefore, monitoring is required to determine whether or not the public is exposed to asbestos in their drinking water. Asbestos monitoring occurs on a **nine year monitoring cycle**. Water systems that are known to have asbestos cement pipe within their distribution systems may require additional sample sites and more frequent monitoring.

A water system that has detectable levels of asbestos or exceeds the MCL will be placed on quarterly monitoring until it is determined that they are reasonably and consistently below the MCL.

Community and non-transient non-community water systems are subject to asbestos monitoring. Asbestos is known to be naturally occurring in Blanco, Culberson, Gillespie, Hudspeth and Llano counties.



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 Sample Types

5

Rather than general time frames for how monitored chemicals are initially scheduled from a regulatory standpoint, this section covers the types or varieties of samples that may be collected from the point of view of the sampler. When a sampler sees that the schedule contains instructions to collect a routine, quarterly, priority, confirmation or other specific type of sample, this section of the guide will help the sampler to understand how certain types of samples should be handled.

Routine Samples (RT)

Normally scheduled samples, whether collected quarterly, annually, triennially, once every six years or once every nine years, are considered routine samples. Analytical results from routine samples may determine whether a system will qualify for reduced monitoring, or if a system needs to be monitored more frequently. The detection of a regulated chemical, or a detected concentration above its MCL, may trigger increased monitoring. An absence of detections, or levels well below the associated MCLs, may qualify a system for reduced monitoring.

Confirmation (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 contract samplers or by regional staff. The analytical costs for these samples are usually billed to the PWS; however, on occasion the TCEQ may request that the lab fees be billed to the TCEQ.

Special Samples (SP)

These are samples that are out of the ordinary. The three main types are described below. All related scheduling of chemical samples is performed by the TCEQ DWQ Program.

Special Request Samples

These are samples that are requested by the water system when the sampler is in the field - and are often related to new wells and new entry points. This type of sampling is permissible only if the DWQ Program is notified first and approves the samples prior to collection. The sampler should call the TCEQ Sample Schedule Coordinator or Contract Manager for approval and to obtain associated TCEQ ID numbers if necessary.

Process Control Samples

These are other samples the system is interested in for process control. These should **not** be collected by the TCEQ or its contractor. The contract only pays for TCEQ compliance samples and other TCEQ business needs.

Investigation Samples

Samples requested because of complaints, investigations, and other contamination events, in the event that regional TCEQ staff is unable to collect the samples.

“TCEQ Pay” Samples

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

Field Blanks (FB)

DEFINITIONS	
Field Blank	A Field Reagent Blank (FRB), or field blank , 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.

Each type of sample that is collected for public drinking water compliance must be collected and analyzed according to specific EPA approved and numbered methods. No other methodology is allowed or is applicable for public drinking water sampling. After researching the EPA approved methods and after discussing this issue with Quality Assurance (QA) officers from certified laboratories in Texas, and the EPA QA representatives from Dallas and Cincinnati, it was determined that most of the approved methods do not require or recommend field QA samples because:

1. Only certain chemical groups are likely to be contaminated during collection, and
2. Most drinking water samples result in no detections, and therefore a field QA sample is redundant.
3. Additionally, all water systems are monitored at least triennially and 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, then it is not of drinking water concern, or is an artifact.

It is for these reasons that most QA activities required by the approved methods occur within the laboratory and not in the field. However, where applicable, the EPA approved analytical 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. Therefore, only methods which are approved for the identification and measurement of analytes that are at risk of becoming contaminated by non-sample related analytes in the field environment have requirements for field blanks and/or trip blanks. The analytes that are at risk of contamination during the field sampling process are included in the VOC and SOC groups. Therefore, no other groups of drinking water samples require any field QA sampling.

All VOC and EDB/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 officer.

Reagent-grade water should be used for field blanks. Field blank water should be prepared so that it does not contain any measurable levels of any of the chemicals monitored in the VOC or target methods, and should be refrigerated and stored in a manner that prevents any possible contamination prior to its use in the field. Each bottle of field blank water may be used only once, because once it is opened, it has potentially become compromised with air contaminants. The sampler should treat the field blank in the exact same manner as the sample being collected.

Emergency and Priority Sampling

Emergency Samples (24 / 48 hours):

The contract between TCEQ and the sample 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 should be delivered by overnight shipping and analyzed by the laboratory as quickly as possible. Laboratories should 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.

Priority Samples (1 week / 2 week):

TCEQ has the need for 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 should be delivered to and analyzed by the laboratory as quickly as possible. Laboratories should report results to the TCEQ as soon as possible. Some reasons for collecting a priority sample include:

- An exceedance of an MCL at an entry point.
- Detections of certain regulated chemicals like benzene, atrazine, and other chemicals that have the potential to be source water contaminations.
- Confirmation of nitrate or nitrite exceedances at certain non-transient/non-community systems.
- New well samples for systems with capacity issues.

The contractor is required to notify the TCEQ by close of business the same day after emergency/priority samples are collected. The TCEQ ID numbers of each sample should be included in the notice along with a copy of the Sample Collection Analysis Report (SCAR).

Composite Samples

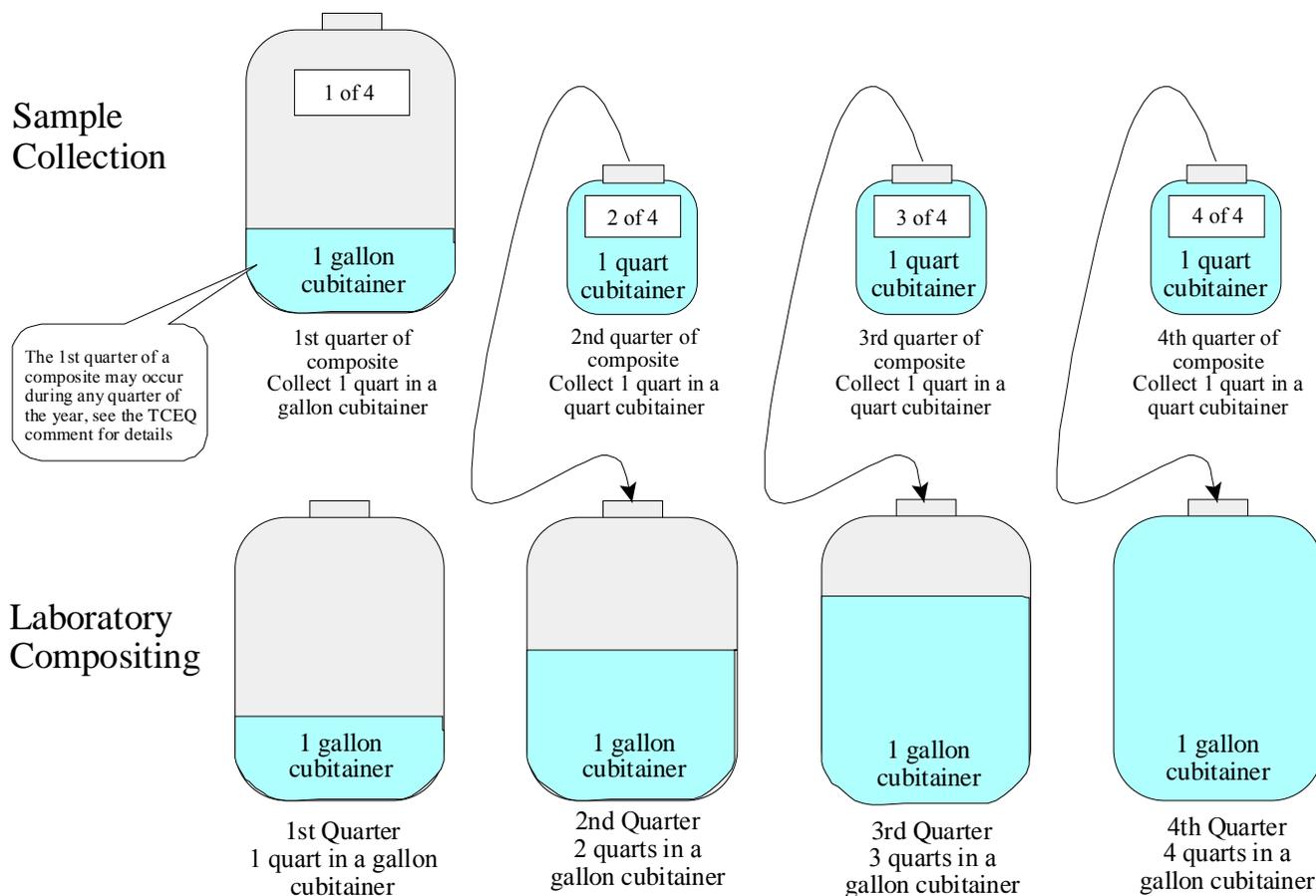
Composite samples are appropriate in situations where an average value is acceptable. The only type of compositing that is allowed at this time is referred to as “temporal compositing”. Compositing of individually collected samples must be performed by the laboratory.

Temporal Composites

The term “temporal composite” is used for a radiological 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 combined together for analysis. The same sample site is sampled for all four quarters; 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 water system will only have to pay for one analysis instead of four. The use of temporal compositing of radiochemical samples was greatly reduced in FY2006 to aid in compliance and enforcement activities. Compositing may continue in the future as TCEQ deems necessary. TCEQ no longer routinely schedules temporal composites.

Radiochemical Temporal Composites

Radiochemical Composites (Temporal)



Radiological 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.

Duplicate and Triplicate Samples

The contractor is required to routinely collect VOC and SOC duplicates or triplicates for quality control purposes as required by the laboratories. Duplicate and triplicate samples should be collected in a manner to ensure that the water is exactly the same in each sample bottle. These samples are collected for use in quality control measures as 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.

Source Water Samples

Source water samples are taken from the source water, either a surface water source or a ground water well. To avoid sampling stagnant water, wells must be pumped/flushed a sufficient amount of time to remove water standing in the well casing. As a general rule, the removal of 3-5 well-casing volumes of water from a well is sufficient to purge the well of stagnant water and replace it with water representative of the aquifer. Calculating the amount of time to remove this amount of water is complex. Therefore, as a general rule you should allow 15-30 minutes of pumping/flushing before taking a sample. The deeper the well the longer it needs to be pumped. Ask the PWS representative the depth of the well. Wells greater than 100 feet deep should be flushed for the full 30 minutes. Failure to remove stagnant water from the well may adversely affect the analytical test results, and the sample may have to be recollected. When scheduling this type of sample collection with the water system, they should be notified of this requirement so that the well has already been purged, and is ready for sampling when the sampler arrives.

For ground water, sampling should occur at the well head. Regulations require 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)). If such a sample tap is not available, then the sample should 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 and complete a field report noting the absence of a sampling tap on the well head.

Source water from a surface water source should be sampled from the raw water intake into the treatment plant. Many surface water treatment plants have a raw water sample tap in their lab.

Section

6

New Sites - Entry Points and Wells

New Sources

New sites will be scheduled when the TCEQ determines that an entity must initiate routine chemical monitoring. This occurs when a new well is drilled, when information or queries identify a new entry point, 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.

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

Interim Approval

The Plan Review Team of the TCEQ sends a water system an “Well Completion Letter” when a newly drilled or newly discovered well is approved for use. The Plan Review team requires a list of chemicals that must be analyzed before granting interim approval. Samples for interim approval are **not** collected by the TCEQ Regions or by the sample contractor.

Upon receipt and review of *source* water sample results, the TCEQ Plan Review Team reviews this source water data and notifies the public water system that the new well has received Interim 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 MCL violation is found to exist, the PWS may receive *conditional interim approval*.

Final Approval

The Well Completion Letter includes a requirement that the system conduct final approval sampling. The letter states that the system must contact the Drinking Water Quality Program to ensure that samples are collected within 180 days of the date of the well completion letter. The DWQ team schedules new wellw in the sample contractor’s monthly update and updates the site information in SDWIS. These samples must be collected within eight (8) weeks which will be designated in the schedule as a season date range.

New wells need to be effectively purged prior to sampling. This is needed to clear the well of all deleterious matter which may be present after the drilling process. Failure to properly purge new wells will increase the potential for the well’s water quality to not meet standards (see **Section 5**). When scheduling an appointment with a PWS for new well sampling, make sure they are aware of the flushing requirements.

Final Approval New Well Samples:

- **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, and they will be billed by the laboratory.

Section

7

How Samples are Scheduled

This section presents the mechanics of how a chemical sample is scheduled, following the guidelines described in **Section 4**, which describes the regulations and policies of the TCEQ.

Annual Sample Schedule

The Drinking Water Quality Program in TCEQ's Central Office produces the annual sampling schedule and provides it electronically to the sampling contractor each year as a database file. A draft is usually provided to the contractor and a summary of the numbers of chemical groups to the laboratories in mid-December for planning purposes. A final schedule is created in late December before the Christmas holiday.

The contractor reviews the final schedule, and then begins to schedule collection dates for their samplers. The schedule is in electronic form and is called YEAR_SDWIS_LST. YEAR is the calendar year, so, for example, the 2017 schedule would be 2017_SDWIS_LST. This schedule lists all of the normally scheduled samples for each system for the calendar year.

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

NOTE

Any samples that need to be collected by the sampling contractor must be scheduled by the DWQ Program in the Central Office at (512) 239-4691.

Monthly Schedule Updates

Sampling frequency is subject to change during the year depending on sample results. In addition, there are occasions when new PWSs are created or old PWSs are inactivated. The TCEQ provides the contractor with an electronic monthly 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 contractor reviews the monthly update and incorporates the changes into their work plan. The 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 update in which they were cancelled will not be paid.

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

E-mail Updates

Occasionally, emergency or priority samples may need to be collected with a rapid turnaround. The monthly update process can not meet this need. Therefore, depending on the situation, TCEQ staff will contact the TCEQ Region or the contractor and discusses the availability of samplers for collecting these samples. Often, the TCEQ Region is more appropriate for certain activities. The 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 1 or 2-week turnaround "priority" sample option is also available. No matter which sampler is used, the request needs to be documented by e-mail and in the sample schedule.

Section 8 General Sample Collection Issues

8

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

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 per the directives of the TCEQ. 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 throughout the year to pass on information regarding additions, deletions and other schedule changes.

Sometimes unexpected sampling situations arise during a visit. Consequently, you should always maintain a moderate supply of extra sampling equipment and supplies. It is usually better to collect a sample and then discard it later, if deemed unnecessary, than to make an extra return trip to the same location.

Checklist for Sample Collectors

Don't forget to....		✓
1	Know your area and schedule efficient sample collection routes	
2	Ask good questions of the PWS when scheduling a sample collection appointment	
3	Keep good 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 system's Monitoring Plan when necessary	
6	Calibrate, QC and maintain field instruments as required	
7	Always keep good sample collection records and record important information on Field Reports when necessary	
8	Always 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 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.	

Dress and act professionally at all times when visiting public water systems. 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. A clean shirt should be worn, T-shirts with slogans are not acceptable. Appropriate foot wear should also be worn, preferably steel-toed work shoes or boots. Open toed shoes such as sandals or flip-flops are never acceptable.

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

Sample Verification

Always double check your forms or tablet and containers before making shipments to the laboratories. An extra 5-10 minutes spent at the end of the day could save you the hours required to recollect rejected samples because the paperwork was incomplete or incorrect, or the samples were mislabeled. Also make sure that the samples are adequately iced so that they are within the appropriate temperature range when they are received by the laboratory.

Paperwork

Section 10 contains a full discussion of the submission form (Public Water System Water Analysis form), the Field Report form and the Chain of Custody form.

A multi-part PWS Water Analysis form (sample submission form TCEQ-0351) is available for your use. The top original (white) goes to the contractor's main office to be submitted to the TCEQ, the first copy goes to the laboratory, the second copy goes to the public water system, and the last copy goes to the sampler. Examples of each form are provided in **Section 10**. A TCEQ approved electronic equivalent that captures all mandatory data listed in Section 10 is also acceptable.

The contractor will keep a record of all samples collected on the behalf of the TCEQ and the TCEQ recommends that each collector maintain a personal record of every sample collected as well (field notes). All parts of the submission form 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 water system representative, the sample will be invalidated.

Remember that the submission form and the Chain-of-Custody form are legal documents. These forms should be completed carefully and clearly. Forging a water system 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 submission forms and chain-of-custody forms are correct before submitting your sample shipment. Samples submitted with incomplete or inaccurate paperwork will be rejected by the laboratories.

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

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

Supplies

Amber glass bottles, 40 and 60 mL vials, plastic cubitainers, pipettes and other routine supplies, including all sampling and field testing equipment and chemical preservatives and reagents, are provided by the contractor. All sample collectors (TCEQ staff, as well as contractor staff) are responsible for obtaining and using proper sampling equipment, supplies and preservation chemicals.

Unused sample containers and supplies should be stored in a manner that ensures that they do not become contaminated during storage. Do NOT store in excessively hot areas, or areas where volatile chemicals are present, such as garages, etc. Stock chemical/reagent supplies must be properly labeled and include the received date, the date the container was first opened, and/or any applicable expiration date. Chemicals must be stored according to label requirements; this includes temperature.

All aliquots of reagents must be labeled, including an expiration date. Chemical storage areas and each vehicle should maintain copies of appropriate and well organized and accessible Material Safety Data Sheets (MSDS). Reagents must be discarded after their expiration dates.

Sample Containers

Use the appropriate number of sample container(s) and one PWS Water Analysis form for each sample collected. A TCEQ approved electronic equivalent that captures all mandatory data is also acceptable. **Section 9** lists which types of containers are to be used for each sample type.

Some sample types (i.e., VOCs, THMs) require more than one container per sample but only one PWS Water Analysis form is required for each sample. For example, when a VOC is selected you must submit two 40 mL vials of drinking water and two 40 mL vials of field blank water for this sample. The laboratory must always be able to positively identify the PWS Water Analysis form with the appropriate sample containers or **the sample will be rejected**. This requires that each sample container be clearly identified.

EPA regulations **require** that each sample container be properly identified with the following information:

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

The container may be labeled with additional information if needed. All information may be pre-printed onto container labels, however, caution should be used when pre-printing collectors initials since that is subject to change. Errors should be corrected by crossing out the incorrect data with a single line and then initialing.

Sample Collection / Flushing

Generally speaking, all of the samples discussed in this manual are intended to represent the quality of the water delivered to customers. For all of the samples discussed here, you should 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 a measurable chlorine residual (for entry points). In any case, you should always flush the tap for *at least* 5 minutes. The tap flushing times and temperature readings should be recorded on the PWS Water Analysis form (or electronic equivalent).

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). When collecting samples that are allowed to have a small amount of head space, fill the container to the neck.

Field Measurements

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

For every sample, **including source samples**, the chlorine residual must be measured and recorded on the PWS Water Analysis form. Minerals (MIN) and Secondary (SEC) samples require field measurement of pH.

When using a hand-held colorimetric chlorine analyzer (for example, the Hach Pocket Colorimeter II), it is important to recognize that there may be a need to test the sample 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. Another common error is to not allow the sample to sit in contact with the DPD reagent for the necessary time it takes to completely react. For very high chlorine levels it may be necessary to dilute the sample to obtain an endpoint. Make sure to rinse vials thoroughly between uses to avoid carry-over. Follow the manufacturer's instructions for your chlorine analyzer when analyzing high chlorine levels. Samples with high chlorine residuals may require additional dechlorinating agent to be added to the sample container (see **Appendix H**).

Some samples require you to measure the pH of the sample for preservation purposes. Follow your equipment manufacturer's guidelines for the proper use and calibration of your instruments. See **Section 11**.

Preservation

Preservation of the samples is extremely important in order to ensure that analytical results accurately represent the water collected, and that the samples are not 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 MSDS. It is your responsibility to use appropriate eye, hand, and clothing protection. Pre-spiking of sample bottles with preservatives is not permitted unless specifically allowed in a sample collection procedure.

WARNING!!

The TCEQ is not responsible for your negligence. Always follow appropriate safety precautions in order to avoid injuries.

Reasons for Preservation

Some analytes may change form, increase in concentration, or decrease in concentration if a preservative is not added. For example, disinfection byproducts 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 of various types are the most common sample preservatives that may pose a health risk or hazard. Chemical preservatives must be handled with caution and all appropriate safety procedures should be 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. MSDSs should always be available wherever chemicals are stored, including vehicles.

Expiration dates and storage

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

Sample Storage

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

Shipping

The contractor is responsible for shipment of all collected samples to the appropriate laboratory so that analyses can be conducted in accordance with EPA approved methods.

- Each sample must be accompanied by a PWS Water Analysis form (or electronic equivalent),
- Each shipment must be accompanied by a properly completed chain-of-custody form,
- When a sample is shipped to the laboratory, it must be packaged in a proper shipping container to avoid leakage and/or breakage during transit,
- Adequate ice should 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 data,
- PWS Water Analysis and Chain-of-Custody forms should 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 shipping containers should be sealed securely with shipping tape, strapping tape, fiber plastic tape, etc.
- Each shipping container must be properly sealed to prevent tampering. Adequate sealing devices (custody seal) 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 shipping container. When sent by U.S. Mail, register the package with a return receipt requested. When sent by a shipping service, obtain a copy of the bill of lading (tracking information). Post office receipts and bills of lading may be used as part of the Chain of Custody 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 labs must also be maintained throughout each sampling period to assure that the laboratory capacity is not exceeded. This will require that the sample collection contractor and each shipper carefully plan and coordinate the collection and shipment of samples. 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 will give the sampler and laboratory an indication of the type of sample to be collected. Sample periods that contain a "Q" are quarterly samples and should be prioritized over annual samples (sample periods that contain a "Y"), both for collection, and analysis and reporting. The sampler or laboratory should call the contractor or the DWQ program if there is any question on priority.

Sampling Guidelines

If a sampler has any questions about any of the samples, they should not hesitate to call the contractor's project manager or secondarily the TCEQ contract manager.

1. If an entry point has an annual MIN and quarterly nitrate (1ST through 4THQ) 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. Make sure to collect the other nitrate quarters as scheduled. This policy applies to other single analytes that may be contained in any group sample. Samples that are unnecessarily collected and redundant will not be paid for by TCEQ.
2. **Bottled Water facilities** - We collect entry point samples for bottled water as we would any other water supply. Sometimes this may entail taking a sample of the finished product if the bottled water stream is not flowing at the time of the sampling event. This may duplicate sampling that the bottled water company conducts for the Texas Department of State Health Services under food and drug requirements, however, these samples are required by the TCEQ under the SDWA.
3. **DBP samples** - Some systems have many DBP samples scheduled that can not be reasonably collected in one day. You may collect these samples over a two day period, however, make sure that the water supply does not change during this period of time. The rules requires that all samples be collected within a 24-hour period.

Section

9

Water Sample Collection Procedures

All appropriate QA/QC procedures must be followed during the sample collection, preservation, holding and shipping process. The sample preservation requirements listed on the following pages 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.

Special Notes and Precautions	
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 get a 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 (use manufacturer's guidelines) before measuring. Remember to rinse the colorimeter vial thoroughly between samples. Complete flushing before measuring the residual.
High Chlorine Residuals	High chlorine levels may bleach the DPD reagent and give a false zero reading. Use the manufacturer's guidelines for "HIGH LEVEL" readings. Measuring high levels of chlorine 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 the 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. Do not carry over sampling methods from one type of sample to another, this could severely compromise the accuracy of the analysis. 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 the preservatives. Never pre-spike chemicals 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 "head-space free." 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 should 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 analysis forms may be used with TCEQ approval.
Check Your Work!	Double check all forms (or data) and containers for accuracy at the end of the day before shipment 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.

ASBESTOS [1094]	
Submission Form	Mark form with analyte code "1094".
Special Note	Measure and record the chlorine residual
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	<ul style="list-style-type: none"> 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 should 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 is cleared. Fill the cubitainer but leave a 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
Analysis Method	EPA 100.2
Special Notes	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
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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> No field preservation Icing is <i>optional</i> [NO FIELD PRESERVATION]
Analysis Time	Samples must be <i>received</i> by the lab within 5 days of collection. Ship to DSHS LAB only.
Analysis Method	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
Container	Hard or soft plastic, or glass; 1 quart (1 L) [1 L PLASTIC OR GLASS]
Head Space?	Some head space is allowed
Procedure	<ul style="list-style-type: none"> 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. Add sufficient sodium hydroxide (NaOH) until a pH of between 12 and 12.5 is achieved. Seal bottle, and mix gently for one minute.
Preservation	Iced (4°C) [ASCORBIC ACID, NAOH PH>12, COOL 4C]
Analysis Time	Samples must be <i>analyzed</i> by the lab within 14 days of collection.
Analysis 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. <i>Samples with detectable levels of total cyanide will be confirmed with the free cyanide method.</i>

Diquat [2032]	
Submission Form	Mark form with analyte code "2032".
Special Note	Measure and record the chlorine residual
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	<ul style="list-style-type: none"> 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 (H₂SO₄) to achieve a pH < 2¹
Preservation	<ul style="list-style-type: none"> Iced (4°C) Store samples in the dark. (Very light sensitive) [SODIUM THIOSULFATE, H ₂ SO ₄ PH<2, COOL 4C, DARK]
Analysis Time	Samples must be <i>extracted</i> by the lab within 7 days of collection. Ship to DSHS LAB only.
Analysis Method	EPA 549.2
Analytes Measured	Diquat, Paraquat
Other Notes	¹ H ₂ SO ₄ is a STRONG ACID: USE CAUTION!

Disinfection Byproducts {DBP2}	
Submission Form	Mark form with analyte group "DBP2".
Special Note	<ul style="list-style-type: none"> Collect four vials. Always collected in distribution. Measure and record the chlorine residual 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 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 (see Section 9 Procedures - Head Space)
Procedure	<ul style="list-style-type: none"> Label each bottle with a waterproof marker. For method EPA 552.2 (HAA), add 6 mg ammonium chloride (NH₄Cl) to each empty amber glass vial (to dechlorinate).¹ 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	<ul style="list-style-type: none"> Iced (4°C) Store samples in the dark [AMMONIUM CHLORIDE/SODIUM THIOSULFATE, COOL 4C, DARK]
Analysis Time	Samples must be <i>extracted or analyzed</i> by the lab within 14 days of collection.
Other Notes	¹ 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 ₄ Cl or 3 mg of sodium thiosulfate. For example: a sample with 10 mg/L chlorine would require 12 mg (6+6) of NH ₄ Cl. Be careful not to add too much dechlorinating agent to the sample because this may cause interference in the analysis.
Analysis Method	EPA 524.2 (TTHM) , EPA 552.2 (HAA5)
Analytes Measured	Chloroform, Bromodichloromethane, Bromoform, Dibromochloromethane, Monochloroacetic acid, Dichloroacetic acid, Trichloroacetic acid, Bromoacetic acid, Dibromoacetic acid



60 mL amber glass 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 Measure and record the pH and temperature
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	<ul style="list-style-type: none"> 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 should 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 and temperature are measured in the field. Ship to the designated lab only.
Analysis 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), Lead (Pb), Orthophosphate, pH (field measured), Silica (Si), Sodium (Na), Sulfate (SO ₄), TDS, Temperature (field measured)

EDB / DBCP {504}	
Submission Form	Mark form with analyte group "504".
Special Note	<ul style="list-style-type: none"> Collect three (3) vials of sample Collect two (2) vials for a field blank Measure and record the chlorine residual
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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Iced (4°C) Store samples away organic solvent vapors. [SODIUM THIOSULFATE, COOL 4C]
Analysis Time	Samples must be <i>analyzed</i> by the lab within 14 days of collection.
Analysis Method	EPA 504.1
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
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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Iced (4°C) Store samples away from light or heat. [SODIUM THIOSULFATE, COOL 4C, DARK]
Analysis Method	EPA 548.1
Analysis Time	Samples must be <i>extracted</i> by the lab within 7 days of collection. Ship to DSHS LAB only.

Glyphosate [2034]	
Submission Form	Mark form with analyte code "2034".
Special Note	Measure and record the chlorine residual
Container	Dark glass with Teflon (PTFE) cap liners; 1 quart (1 L) [1 L AMBER GLASS]
Head Space?	Some head space is allowed
Procedure	<ul style="list-style-type: none"> 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 (is solid is used).
Preservation	<ul style="list-style-type: none"> Iced (4°C) Store samples away from light. [SODIUM THIOSULFATE, COOL 4C, DARK]
Analysis Method	EPA 547
Analysis Time	Samples must be <i>analyzed</i> 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	<ul style="list-style-type: none"> • Collect two vials. • Always collected in distribution • Measure and record the chlorine residual • Crystalline or granular ammonium chloride should be added to the sample containers prior to shipment to the field.
Container	Amber glass vials with Teflon (PTFE) lined screw-caps; 60 mL [2-60 ML AMBER GLASS]
Head Space?	NO head space allowed (see Section 9 Procedures - Head Space)
Procedure	<ul style="list-style-type: none"> • Label each bottle with a waterproof marker. • Add 6 mg ammonium chloride (NH₄Cl) to an empty vial (to dechlorinate).¹ • 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	<ul style="list-style-type: none"> • Iced (4°C) • Store samples in the dark [AMMONIUM CHLORIDE, COOL 4C, DARK]
Analysis Time	Samples must be <i>extracted</i> by the lab within 14 days of collection.
Other Notes	¹ 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 ₄ Cl. For example: a sample with 10 mg/L chlorine would require 12 mg (6+6) of NH ₄ Cl. Be careful not to add too much dechlorinating agent to the sample because this may cause interference in the analysis.
Analysis Method	EPA 552.2
Analytes Measured	Monochloroacetic acid, Dichloroacetic acid, Trichloroacetic acid, Bromoacetic acid, Dibromoacetic acid



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

Metals {MTL}	
Submission Form	Mark form with analyte group "MTL".
Special Note	Measure and record the chlorine residual
Container	Hard or soft plastic, or glass; 1 quart (1 L) [1 L PLASTIC OR GLASS]
Head Space?	Some head space is allowed
Procedure	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> No field preservation Icing is <i>optional</i> [NO FIELD PRESERVATION]
Analysis Time	Samples must be <i>received</i> by the lab within 14 days of collection.
Other Notes	Lead will be reported with this group.
Analysis 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)

Minerals {MIN}	
Submission Form	<ul style="list-style-type: none"> If a chlorine residual is present (measured ≥ 0.2 mg/L), mark form with analyte group "MIN" and collect a single sample. If a 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 Measure and record the 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	<ul style="list-style-type: none"> 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 should 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.
Analysis 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	<ul style="list-style-type: none"> 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
Container	Hard or soft plastic, or glass; 100 mL [100 ML PLASTIC OR GLASS]
Head Space?	Some head space is allowed
Procedure	<ul style="list-style-type: none"> 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 with chlorine residuals must be <i>analyzed</i> by the lab within 14 days of collection. Samples without chlorine residuals must be analyzed by the lab within 48 hours of collection.
Analysis Method	EPA 300.0 , EPA 353.2

Nitrite [1041]	
Submission Form	<ul style="list-style-type: none"> Mark form with analyte code "1041". Sample must be shipped overnight to the lab.
Special Note	Measure and record the chlorine residual
Container	Hard or soft plastic, or glass; 100 mL [100 ML PLASTIC OR GLASS]
Head Space?	Some head space is allowed
Procedure	<ul style="list-style-type: none"> 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 (NO₂) analysis must be analyzed by the lab within 48 hours <u>regardless</u> of chlorine residual.
Analysis Method	EPA 300.0 , EPA 353.2

Nitrate & Nitrite {NO ₃ ² }	
Submission Form	<ul style="list-style-type: none"> • 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
Container	Hard or soft plastic, or glass; 100 mL [100 ML PLASTIC OR GLASS]
Head Space?	Some head space is allowed
Procedure	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 (NO₂) analysis must be analyzed by the lab within 48 hours <u>regardless</u> of chlorine residual.
Other Notes	Ship the samples via overnight delivery so that they are received by the lab within 24 hours of collection.
Analysis Methods	EPA 300.0 , EPA 353.2



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	<ul style="list-style-type: none"> Collect triplicate (3) samples Measure and record the chlorine residual
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 acceptable
Procedure	<ul style="list-style-type: none"> 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 <i>extracted</i> by the lab within 14 days of collection. Ship to DSHS LAB only.
Analysis 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	<ul style="list-style-type: none"> 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
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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> No field preservation Icing is <i>optional</i> [NO FIELD PRESERVATION]
Analysis Time	Samples must be <i>received</i> by the lab within 5 days of collection. Ship to DSHS LAB only.
Analysis Method	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	<p>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.</p> <p>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.</p>

Secondaries {SEC}	
Submission Form	Mark form with analyte group "SEC".
Special Note	Collect two bottles Measure and record the chlorine residual Measure and record the 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	<ul style="list-style-type: none"> 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 should 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.
Analysis 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 gallon soft plastic container used in the collection of radiochemical samples.



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
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 acceptable.
Procedure	<ul style="list-style-type: none"> • Label each bottle with a waterproof marker. • Add 50 mg of sodium sulfite (Na₂SO₃) to the empty container (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	<ul style="list-style-type: none"> • Iced (4°C) • Store samples in the dark from time of collection until extraction
	[SODIUM SULFITE, HCL PH<2, COOL 4C, DARK]
Analysis Time	Samples must be <i>extracted</i> by the lab within 14 days of collection.
Other Notes	<p>¹ Laboratory QC duplicates are required for SOC Group 5 samples. One in ten samples should 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.</p> <p>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 Na₂SO₃. For example: a sample with 7 mg/L chlorine would require 70 mg of Na₂SO₃. Be careful not to add too much Na₂SO₃ to the sample because this may cause interference in the analysis.</p> <p>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".</p>
Analysis 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), PCP, Propachlor, Simazine, Toxaphene
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.

Synthetic Organic Chemicals - EPA Method 515.4 {515}	
Submission Form	Mark form with analyte group "515".
Special Note	Measure and record the chlorine residual
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 acceptable
Procedure	<ul style="list-style-type: none"> 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. <i>Duplicates are required; collect one duplicate for every ten samples.</i>
Preservation	<ul style="list-style-type: none"> Iced (10°C). DO NOT FREEZE. Store samples in the dark. [SODIUM SULFITE, COOL 10C, DARK]
Analysis Time	Samples must be <i>extracted</i> 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	<ul style="list-style-type: none"> Collect two (2) vials of drinking water Measure and record the chlorine residual
Container	Glass vials with Teflon (PTFE) lined screw-caps; 60 mL [2-60 ML GLASS]
Head Space?	A small amount of head space is allowed
Procedure	<ul style="list-style-type: none"> 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. <i>Duplicates are required; collect one duplicate for every ten samples.</i>
Preservation	<ul style="list-style-type: none"> Iced (4°C) [SODIUM THIOSULFATE, MCA PH<3, COOL 4C]
Analysis Time	Samples must be <i>received</i> by the lab within 7 days of collection, and <i>analyzed</i> by the lab within 28 days of collection.
Notes	* Prepare by mixing 156 mL of 2.5 M monochloroacetic acid and 100 mL 2.5 M potassium acetate.
Analysis Method	EPA 531.1 (Carbamate Insecticides)
Analytes Measured	Aldicarb, Aldicarb Sulfone, Aldicarb Sulfoxide, Carbofuran, Oxamyl, several unregulated analytes



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

Trihalomethanes [2950]	
Submission Form	Mark form with analyte code "2950".
Special Note	<ul style="list-style-type: none"> • Collect two vials. • Always collected in distribution. • Measure and record the chlorine residual • Ammonium chloride/phosphate buffer should be added to the sample containers prior to shipment to the field.
Container	Clear glass vials with Teflon (PTFE) lined screw-caps; 40 mL [2-40 ML CLEAR GLASS]
Head Space?	NO head space allowed (see Section 9 Procedures - Head Space)
Procedure	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Iced (4°C) • Store samples in the dark [SODIUM THIOSULFATE, COOL 4C]
Analysis Time	Samples must be <i>analyzed</i> by the lab within 14 days of collection.
Other Notes	¹ 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.
Analysis Method	EPA 524.2
Analytes Measured	Chloroform, Bromodichloromethane, Bromoform, Dibromochloromethane

Volatile Organics {VOC}	
Submission Form	Mark form with analyte group "VOC".
Special Note	<ul style="list-style-type: none"> Collect two vials of drinking water¹ and two vials of reagent water for a field blank with every sample Measure and record the chlorine residual
Container	Glass screw-top vial equipped with a teflon (PTFE) faced silicone septum; 40 mL [2-40 ML GLASS & FIELD BLANK]
Head Space?	NO head space allowed (see Section 9 Procedures - Head Space)
Procedure	<ul style="list-style-type: none"> 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 Pre-spiking of sample vials 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. Next, half fill the vial. DO NOT SHAKE. Next, add sufficient 6N HCl in order to achieve a pH of < 2. (HCl is used as a preservative) 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	<ul style="list-style-type: none"> Iced (4°C) Store samples away from any organic solvent vapors, and avoid direct sunlight or intense light.
	[ASCORBIC ACID, HCL PH<2, COOL 4C]
Analysis Time	Samples must be <i>analyzed</i> by the lab within 14 days of collection.
Other Notes	<p>¹ Avoid collecting this type of sample in any situation where you can smell petroleum or solvent type fumes.</p> <p>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.</p> <p>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.</p> <ul style="list-style-type: none"> 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, do not shake.. Label the containers to indicate that it is a field blank ("FB" or "Field Blank").
Analysis Method	EPA 524.2
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.

Section Forms and Instructions

10

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. The submission form and Chain-of-Custody form are legal documents. These forms should be completed carefully and clearly. Forging a water system 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, and then writing in the corrected information.

The submission form is defined as the PWS Water Analysis form (see pg. 52) or a TCEQ approved equivalent (including electronic) that captures all mandatory data listed below.

In no case should 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.

Instructions for Fields on the PWS Water Analysis Form

Whenever possible, samplers should utilize PWS Water Analysis forms 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 complete and accurate. If the PWS Water Analysis form is utilized, then each sample must be accompanied by a separate 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 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
- Sampling Location: Facility ID, Facility location, Sample point, Sample location, Latitude and longitude
- Sampling technician's signature
- Water System Representative's signature
- Analysis type
- Chlorine residual
- pH (mandatory for MIN or SEC samples only)
- GPS coordinates (TCEQ will reject if missing or incorrect)

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.

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 #:	Public Water System (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 - Entry point, well code or DS01 for distribution
	Facility Location - Location (address) of entry point; PWS designation for wells
	Sample Point - TRT- TAP (entry points), RAW-TAP (wells), or distribution sample point (i.e. DBP1-01 or ASB-01)
	Sample Location - Sample tap location (entry points), 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 should be flushed for at least 5 minutes, wells should 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:	Sampling technician's signature (with printed name underneath). Signature is mandatory.
Signature of Water System Official:	Water System Representative's signature. The name should be printed underneath the signature. If the signature is missing, the sample will be rejected.
Report To:	Should be the address of the responsible official for the water system. For special samples this usually has the TCEQ Region office number.
Bill To:	Usually the water system. Special samples may be 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.
	Preservation - Write or print the preservation used; see individual sample collection instructions.

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) _____

Signature (Sampling Technician) _____

Print Name - ALL CAPS (Water System Representative)

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: _____

Field Reports

The TCEQ values the information provided by the sampler through field reports. Information from field reports can be used in developing enforcement cases and in evaluating systems for reduced sampling. A field report should be filled out whenever the sampler finds that the data provided by the TCEQ is inaccurate, when a PWS refuses to sample or can not be contacted to arrange sampling, or when a sampling site is 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 a message was left 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 water system.

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

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



DEFINITIONS	
Standpipe	A water tank that is taller than it is wide.

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 Chain of Custody (CoC) form is required for all samples collected by the contract sample collectors. For these samples, a CoC form must be submitted whenever a shipment of samples is delivered to the laboratory. A CoC is also used for complaint samples or spill-response samples that are collected by TCEQ Office of Compliance and Enforcement or Field Operations Divisions Investigators.

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

A CoC form must be used to document all of the samples collected and sent to the laboratory, and must accompany those samples to the laboratory. Depending on the number of samples in a shipment or cooler, more than one form may be necessary. The CoC form must have each analysis request listed with their respective collection dates and times. All samples in the shipping container (cooler) must be represented on the CoC(s). Items listed as mandatory must be completed or the associated sample or samples will be rejected by the laboratory.

The samples should be kept under personal supervision or in locked storage until custody is relinquished to the shipper and formal documentation of the transfer is completed. The person collecting the samples will start the chain of custody procedure. If a shipment or cooler contains samples collected by multiple samplers, each sampler must complete a separate CoC form for his or her samples. If an individual other than the sampler is responsible for shipping the containers of samples after they have been prepared by the sampler, they must sign the CoC form as well, thereby documenting the transfer of responsibility.

When completing the form, care should be taken to insure that all necessary information is filled in, is correct and legibly written. The sampler should 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 chain of custody form shall 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 chain-of-custody form, the error must be corrected by drawing a single line through the mistake and initialing, and then writing in the corrected information.

Custody Seals

Samples to be transported must be packed to prevent breakage. The package must be sealed or locked 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 should be rejected.

Chain of Custody Form Instructions

FIELD	Description	Mandatory?*
Sampler telephone #	Sampler's phone number	No
Project Manager E-Mail 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 should be calibrated and/or QCed 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** use EPA approved analytical methods for drinking water.

Field measurements should be made in accordance with the equipment manufacturer's instructions, and at appropriate times and locations so that valid information is obtained. The contractor's water sampling program or quality assurance 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 Residuals

Measure the chlorine residual at each sample site (including wells) and record it on the PWS Water Analysis form (or electronic equivalent) for every sample. Let the DPD react fully (use manufacturer's guidelines) before measuring. 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. Remember to rinse the colorimeter vials thoroughly between samples. High chlorine levels may require the water sample to be diluted in order to determine an accurate residual. 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) Standards lot number 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 Spec Check standards must be maintained along with the range of dates 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)]. 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

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. 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) Check date, and 6) 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. 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, 3) Name/Initials, 4) Whether or not adjustments were made, and 5) Any applicable notes.

pH Measurements

Samplers are required to use a pH meter that is calibrated with at least 2 points and is accurate to ± 0.1 pH. pH meters must be calibrated each day before use. At least two (2) pH buffers must be used to calibrate the pH meter. A pH 7 and pH 4 buffer are recommended. You should start with the pH 7 buffer. A third pH 10 buffer may be used as well but is usually not necessary unless measuring high pHs. Always use fresh buffer solution. Pour an aliquot of buffer into a small plastic container for calibration and discard this solution when calibration is complete. Never pour used buffer back into the original container, this will contaminate the solution and it will no longer be usable. pH calibrations 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 must be maintained along with the range of dates the solutions were in use.

Distilled or deionized water should be used to rinse the pH probe between buffers and after measuring samples. Store the probes with a small piece of pH 7 buffer-dampened sponge or cloth in the probe's cap to prevent the probe from drying out. A probe that has dried out will no longer produce accurate results.

Recording Locations

The latitude and longitude of each sample site should 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 should be able to measure in digital degrees with at least six (6) decimal places. Tablets, phones or other devices are permitted as long as they meet these requirements.

The location of sample collection must be within 50 meters of the location on file with TCEQ and stored in the SDWIS database. Collected locations that are 50 meters or greater than data on file will be reviewed by TCEQ and any associated samples that are 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.



A typical pH meter

Section Lab Check-In Procedures

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Each environmental lab will have a specimen receiving or check-in station. When coolers, or other containers, of samples are received they are checked in by the staff and the receipt is recorded on the lab chain-of-custody form. Each sample is matched to the submitted chain-of-custody form and submission form, assigned a unique lab identification number, monitored for temperature, and delivered to the respective analyst performing the needed analysis.

When a sample cannot be matched to the submitted chain-of-custody or submission form, 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 the invalidation of samples that do not meet requirements according to TCEQ guidance. 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 chain of custody forms
- 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

Samplers may make corrections to forms by drawing a single line through the mistake and initialing, and then writing in the corrected information. The laboratories are not authorized to make corrections to forms unless directed by the TCEQ DWQ Quality Assurance Specialist or appropriate Rule Compliance Officer. If there is a question regarding sample invalidation, the laboratory or the sampler should contact the TCEQ Quality Assurance Specialist for guidance. The samplers or contractor should not contact the laboratory directly regarding invalid samples or rejections.

In no case should 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.

The laboratories must notify the TCEQ and sample contractor of invalidated samples on a daily basis. If a laboratory deals directly with a public water system (PWS), they should notify the PWS directly of rejected samples (Lead/Copper or TCR 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 upon arrival at the laboratory. These samples should be considered acceptable ONLY if packed on ice immediately after sample collection and hence, delivered while the samples were in the process of reaching an appropriate equilibrium temperature.

Section 13 Laboratory Analysis Fees

13

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 still ensuring that drinking water quality is adequately monitored. Prices are subject to change annually. A comprehensive fee schedule can be found on the DSHS website.

Current Compliance Laboratory Analysis Fees

Analysis Type	Effective 9/1/2016
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)	\$ 113.43
Cyanide - Total (Screen)	\$ 53.75
Diquat (EPA 549.2)	\$ 72.09
Disinfection Byproducts Group (HAA5 & TTHM)	\$ 103.85
Drinking Water Quality Group {DWQ}	\$ 130.79
Endothall (EPA 548.1)	\$ 265.63
Fluoride	\$ 15.03
Glyphosate (EPA 547)	\$ 39.40
Mercury (EPA 245.1)	\$ 18.41
Metals Group {MTL}	\$ 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] 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
Secondaries {SEC}	\$ 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

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 (Method 549.2) [2032]UNREGULATED

Paraquat [2028]

DRINKING WATER QUALITY {DWQ}

Alkalinity [1927, 1928, 1929, 1931]
 Calcium [1016]
 Chloride [1017]
 Conductivity [1064]
 Copper [1022]
 Lead [1030]
 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 (Method 548.1) [2033]**GLYPHOSATE (Method 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) [1022]
 Iron (Fe) [1028]
 Manganese (Mn) [1032]
 Silver (Ag) [1050]
 Zinc (Zn) [1095]

OTHER:

Calcium (Ca) [1016]
 Lead (Pb) [1030]
 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 (NO₃) [1040]
 Nitrite (NO₂) [1041]

NITRATE [1040]**PCBs (Method 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) [1022]
 Fluoride (F) [1025]
 Iron (Fe) [1028]
 Manganese (Mn) [1032]
 pH [1925]
 Silver (Ag) [1050]
 Sulfate (SO₄) [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]

TRIHALOMETHANESREGULATED

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

Fields and definitions for the annual sample schedule table (LST). Fields are equivalent to SDWIS when applicable. Any changes **must** be pre-approved by the TCEQ.

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	
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

FIELD NAME	OWNER-SHIP	DESCRIPTION	VALID CONTENT	TYPE	SIZE
B_ORIGINAL_COLLECTION_DATE	Contractor	Collection date of original sample for recollected samples	Date	Date	
B_SAMPLE_REJECTION_REASON	LAB	Sample rejection code	FacSee 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	Lets contractor know 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
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 in 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	

FIELD NAME	OWNER-SHIP	DESCRIPTION	VALID CONTENT	TYPE	SIZE
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

A test is requested in the annual schedule table by using **either** an analyte group **or** an analyte code. Any changes to this list **must** be compatible with SDWIS and pre-approved by the TCEQ. See Appendix A for individual analytes included in each analyte group.

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		1022	IOC
Cyanide		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		1030	IOC
Manganese		1032	IOC
Mercury		1035	IOC
Metals group	MTL		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	SEC		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

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. 2017

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.

Appendix

D

Approved Methods - 40 CFR §141, §143

The list of methods for analysis under the Safe Drinking Water Act is provided in the table below. The list of methods is also available online at <http://water.epa.gov/scitech/drinkingwater/lab-cert/analyticalmethods.cfm>. The lists of methods online and the tables below should accurately reflect the promulgated methods specified in the Code of Federal Regulations (CFR). The methods for determining primary contaminants are included in 40 CFR Part §141 which 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 and those below. Note that for the TCEQ's Drinking Water Program, only the methods listed in Section 9 of this Sampling Guide may be used to analyze samples.

Analyte	MCL/SCL	EPA	ASTM	SM	Other
Inorganic Chemicals § 290.106					
Antimony (Sb)	0.006 mg/L	200.5 Rev 4.2, 200.8 Rev 5.4, 200.9 Rev 2.2	D3697-07, D3697-02, D3697-92	3113 B, 3113 B-04, 3113 B-99	
Arsenic (As)	0.010 mg/L	200.5 Rev 4.2, 200.8 Rev 5.4, 200.9 Rev 2.2	D2972-08 B, D2972-08 C, D2972-03 B, D2972-03 C, D2972-97 B, D2972-97 C	3113 B, 3113 B-04, 3113 B-99; 3114 B, 3114 B-09, 3114 B-97	
Asbestos	7 mF/L	100.1, 100.2			
Barium (Ba)	2 mg/L	200.5 Rev 4.2, 200.7 Rev 4.4, 200.8 Rev 5.4		3111 D, 3111 D-99, 3113 B, 3113 B-04, 3113 B-99, 3120 B, 3120 B-99	
Beryllium (Be)	0.004 mg/L	200.5 Rev 4.2, 200.7 Rev 4.4, 200.8 Rev 5.4, 200.9 Rev 2.2	D3645-97 B, D3645-03 B, D3645-08 B	3113 B, 3113 B-04, 3113 B-99, 3120 B, 3120 B-99	
Cadmium (Cd)	0.005 mg/L	200.5 Rev 4.2, 200.7 Rev 4.4, 200.8 Rev 5.4, 200.9 Rev 2.2		3113 B, 3113 B-04, 3113 B-99	
Chromium (Cr)	0.1 mg/L	200.5 Rev 4.2, 200.7 Rev 4.4, 200.8 Rev 5.4, 200.9 Rev 2.2		3113 B, 3113 B-04, 3113 B-99, 3120 B, 3120 B-99	
Cyanide	0.2 mg/L	335.4 Rev 1.0	D2036-06 A, D2036-06 B, D2036-98 A, D2036-98 B; D6888-04	4500-CN-C, 4500-CN-E, 4500-CN-F, 4500-CN-G, 4500-CN-E-99, 4500-CN- F-99, 4500-CN-G-99	ALPKEM: OIA-1677, DW; H&E Testing Laboratory: ME335.01; Kelada 01 Rev 1.2; USGS: I-3300-85; Lachat Inst.: QuikChem 10-204-00-1-X Rev 2.1
Fluoride (F)	4 mg/L (MCL)	300.0 Rev 2.1, 300.1 Rev 1.0	D1179-04 B, D1179-10 B, D1179-93 B, D1179-99 B; D4327-03, D4327-97	4110 B, 4110 B-00; 4500-F-B, 4500-F-B-97, 4500-F-C, 4500- C-97, 4500-F- D, 4500-D-97, 4500-F-E, 4500- E-97	Bran + Luebbe: 129-71W, 380- 75WE; Waters Corporation: D6508 Rev 2; Hach Co.: 10225

Analyte	MCL/SCL	EPA	ASTM	SM	Other
Mercury (Hg)	0.002 mg/L	200.8 Rev 5.4; 245.1 Rev 3.0; 245.2	D3223-02, D3223-97	3112 B, 3112 B-99; 3112 B-09	
Nitrate (NO3)	10 mg/L	300.0 Rev 2.1; 300.1 Rev 1.0; 353.2 Rev 2.0	D3867-90 A, D3867-90 B; D4327-03, D4327-97, D6508-00	4110 B, 4110 B-00; 4500-NO3-D, 4500-NO3-D-00, 4500-NO3-E, 4500-NO3-E-00, 4500-NO3-F, 4500-NO3-F-00	ATI Orion: 601; Systea Scientific, LLC: Systea Easy (1-Reagent); Waters Corp.: B-1011, D6508 Rev 2; Hach Co.: 10206
Nitrite (NO2)	1 mg/L	300.0 Rev 2.1; 300.1 Rev 1.0; 353.2 Rev 2.0	D3867-90 A, D3867-90 B; D4327-03, D4327-97, D6508-00	4110 B, 4110 B-00; 4500-NO2-B, 4500-NO2-B-00; 4500-NO3-E, 4500-NO3-E-00, 4500-NO3-F, 4500-NO3-F-00	Systea Scientific, LLC: Systea Easy (1-Reagent); Waters Corp.: B-1011, D6508 Rev 2
Selenium (Se)	0.05 mg/L	200.5 Rev 4.2; 200.8 Rev 5.4; 200.9 Rev 2.2	D3859-03 A, D3859-03 B, D3859-08 A, D3859-08 B, D3859-98 A, D3859-98 B	3113 B, 3113 B-04, 3113 B-99; 3114 B, 3114 B-09, 3114 B-97	
Thallium (Tl)	0.002 mg/L	200.8 Rev 5.4; 200.9 Rev 2.2			
Inorganic Chemicals § 290.117					
Copper (Cu)	1.0 mg/L	200.5 Rev 4.2, 200.7 Rev 4.4, 200.8 Rev 5.4, 200.9 Rev 2.2	D1688-90 A, D1688-90 C, D1688-95 A, D1688-95 C, D1688-02 A, D1688-02 C, D1688-07 A, D1688-07 C	3111 B, 3111 B-99, 3113 B, 3113 B-04, 3113 B-99, 3120 B, 3120 B-99	
Lead (Pb)	0.015 mg/L	200.5 Rev 4.2, 200.8 Rev 5.4, 200.9 Rev 2.2	D3559-08 D, D3559-03 D, D3559-90 D, D3559-96 D	3113 B, 3113 B-04, 3113 B-99	Palintest Ltd. Or Hach Co.: Method 1001
Inorganic Chemicals § 290.118					
Aluminum (Al)	0.2 mg/L	200.5 Rev 4.2, 200.7 Rev 4.4, 200.8 Rev 5.4, 200.9 Rev 2.2		3111 D, 3111 D-99; 3113 B, 3113 B-04, 3113 B-99; 3120 B, 3120 B-99	
Chloride (Cl)	300 mg/L	300.0 Rev 2.1; 300.1 Rev 1.0	D4327-03, D4327-97; D512-04 B, D512-89 B	4110 B, 4110 B-00, 4500-Cl B, 4500-Cl B-97, 4500-Cl D, 4500-Cl D-97	Waters Corporation: D6508
Copper (Cu)	1.0 mg/L	200.5 Rev 4.2, 200.7 Rev 4.4, 200.8 Rev 5.4, 200.9 Rev 2.2	D1688-90 A, D1688-90 C, D1688-95 A, D1688-95 C, D1688-02 A, D1688-02 C, D1688-07 A, D1688-07 C	3111 B, 3111 B-99, 3113 B, 3113 B-04, 3113 B-99, 3120 B, 3120 B-99	

Analyte	MCL/SCL	EPA	ASTM	SM	Other
Fluoride (F)	2 mg/L (SCL)	300.0 Rev 2.1, 300.1 Rev 1.0	D1179-04 B, D1179-10 B, D1179-93 B, D1179-99 B; D4327-03, D4327-97	4110 B, 4110 B-00; 4500-F-B, 4500-F-B-97, 4500-F-C, 4500-C-97, 4500-F-D, 4500-D-97, 4500-F-E, 4500-E-97	Bran + Luebbe: 129-71W, 380-75WE; Waters Corporation: D6508 Rev 2; Hach Co.: 10225
Iron (Fe)	0.3 mg/L	200.5 Rev 4.2; 200.7 Rev 4.4; 200.9 Rev 2.2		3111 B, 3111 B-99; 3113 B, 3113 B-99; 3120 B, 3120 B-99	
Manganese (Mn)	0.05 mg/L	200.5 Rev 4.2; 200.7 Rev 4.4; 200.8 Rev 5.4; 200.9 Rev 2.2		3111 B, 3111 B-99; 3113 B, 3113 B-99; 3120 B, 3120 B-99	
Silver (Ag)	0.1 mg/L	200.5 Rev 4.2; 200.7 Rev 4.4; 200.8 Rev 5.4; 200.9 Rev 2.2		3111 B, 3111 B-99; 3113 B, 3113 B-99; 3120 B, 3120 B-99	USGS: I-3720-85
Sodium (Na)		200.5 Rev 4.2; 200.7 Rev 4.4	D6919-03, D6919-09	3111 B, 3111 B-99	
Sulfate (SO4)	300 mg/L	300.0 Rev 2.1; 300.1 Rev 1.0; 375.2 Rev 2.0	D4327-03, D4327-97; D516-02, D516-07, D516-11, D516-90	4110 B, 4110 B-00; 4500-SO42-C & C-97, -D & -D-97, -E & -E-97, -F & F-97	Waters Corporation: D6508
TDS	1000 mg/L			2540 C, 2540 C-97	
Zinc (Zn)	5 mg/L	200.5 Rev 4.2; 200.7 Rev 4.4; 200.8 Rev 5.4		3111 B, 3111 B-99; 3120 B, 3120 B-99	
Inorganic Chemicals § 290.110, §111, §112 - Approved Laboratory					
Alkalinity			D1067-02 B, D1067-06 B, D1067-11 B, D1067-92 B	2320 B, 2320 B-97	USGS I-1030-85
Calcium (Ca)		200.5 Rev 4.2; 200.7 Rev 4.4	D511-03 A, D511-03 B, D511-09 A, D511-09 B, D511-93 A, D511-93 B, D6919-03, D6919-09	3111 B, 3111 B-99, 3120 B, 3120 B-99, 3500-Ca D, 3500-Ca B, 3500-Ca B-97	
Chlorine Dioxide	0.8 mg/L	327 Rev 1.1		4500-CIO2 D, 4500-CIO2 E, 4500-CIO2 E-00	
Chlorine, Free	> 0.2 mg/L & < 4.0 mg/L		D1253-03, D1253-86	4500-CI D, 4500-CI D-00, 4500-CI F, 4500-CI F-00, 4500-CI G, 4500-CI G-00, 4500-CI H, 4500-CI H-00	

Analyte	MCL/SCL	EPA	ASTM	SM	Other
Chlorine, Total	> 0.5 mg/L & < 4.0 mg/L		D1253-03, D1253-86	4500-CI D, 4500-CI D-00, 4500-CI E, 4500-CI E-00, 4500-CI F, 4500- CI F-00, 4500-CI G, 4500-CI G-00, 4500-CI I, 4500- CI I-00	
Chlorite (at Entry Point)	1.0 mg/L	300.0 Rev 2.1; 300.1 Rev 1.0; 317.0 Rev 2.0; 326.0 Rev 1.0; 327.0 Rev 1.1	D6581-00	4500-CIO2 E, 4500-CIO2 E-00	
pH	> 7.0	150.1; 150.2	D1293-12, D1293-84, D1293-95, D1293-99	4500-H+ B, 4500-H+ B-00	
Phosphate, Ortho-		300.0 Rev 2.1; 300.1 Rev 1.0; 365.1 Rev 2.0	D4327-03, D4327-97; D511-88 A, D6508-00	4110 B, 4110 B-00; 4500-P E, 4500- P E-99, 4500-P F, 4500-P F-99	USGS : I-1601-85, I-2598- 85, I-2601-90; Waters Corp.: D6508 Rev 2
Temperature				2550, 2550-00	
Total Organic Carbon (TOC)		415.3 Rev 1.1		5310 B, 5310 B-00, 5310 C, 5310 C-00, 5310 D, 5310 D-00	
Turbidity		180.1 Rev 2.0		2130 B, 2130 B-01	Hach Co.: 10133 Rev 2.0; Great Lakes Inst.: Method 2
UV 254 for SUVA		415.3 Rev 1.1		5910 B, 5910 B-00	
Water Quality Parameters - Approved Laboratory					
Bromide		300.0 Rev 2.1, 300.1 Rev 1.0, 317 Rev 2.0, 326 Rev 1.0	D6581-00		
DOC for SUVA		415.3 Rev 1.1		5310 B, 5310 B-00, 5310 C, 5310 C-00, 5310 D, 5310 D-00	
Magnesium (Mg)		200.5 Rev 4.2, 200.7 Rev 4.4	D511-03 A, D511-03 B, D511-09 A, D511-09 B, D511-93 A, D511-93 B, D6919-03, D6919-09	3111 B, 3111 B-99, 3120 B, 3120 B-99, 3500-Mg B, 3500-Mg E, 3500-Mg B-97	
SUVA		415.3 Rev 1.1			

Analyte	MCL/SCL	EPA	ASTM	SM	Other
Other - Recommended					
Conductivity			D1125-91 A, D1125-95 A	2510 B, 2510 B-97	
Nickel (Ni)		200.5 Rev 4.2; 200.7 Rev 4.4; 200.8 Rev 5.4; 200.9 Rev 2.2		3111 B, 3111 B-99; 3113 B, 3113 B-04, 3113 B-99; 3120 B, 3120 B-99	
Silica		200.5 Rev 4.2; 200.7 Rev 4.4	D859-00, D859-05, D859-10, D859-88, D859-94	3120 B, 3120 B-99; 4500-Si D, 4500 Si E, 4500 Si F; 4500 SiO2 C, 4500 Si C-97, 4500 SiO2 D, 4500 SiO2 D-97, 4500 SiO2 E, 4500 SiO2 E-97	USGS: I-1700-85, I-2700-85
Synthetic Organic Chemicals §290.107					
2,3,7,8-TCDD (Di-oxin)	0.00003 µg/L	1613			
2,4-D	0.07 mg/L	515.1 Rev 4.0; 515.2 Rev 1.1; 515.3 Rev 1.0; 515.4 Rev 1.0; 555 Rev 1.0	D5317-93, D5317-98	6640 B, 6640 B-01	
2,4,5-TP (Silvex)	0.05 mg/L	515.1 Rev 4.0; 515.2 Rev 1.1; 515.3 Rev 1.0; 515.4 Rev 1.0; 555 Rev 1.0	D5317-93, D5317-98	6640 B, 6640 B-01	
Alachlor	2 µg/L	505 Rev 2.1; 507 Rev 2.1; 508.1 Rev 2.0; 525.2 Rev 2.0; 525.3; 551.1 Rev 1.0			
Atrazine	3 µg/L	505 Rev 2.1; 507 Rev 2.1; 508.1 Rev 2.0; 523; 525.2 Rev 2.0; 525.3; 536; 551.1 Rev 1.0			Syngenta AG-625
Benzo(a)pyrene	0.2 µg/L	525.2 Rev 2.0; 525.3; 550; 550.1			
Carbofuran	0.04 mg/L	531.1 Rev 3.1; 531.2 Rev 1.0		6610 B, 6610 B-04	
Chlordane	2 µg/L	505 Rev 2.1; 508 Rev 3.1; 508.1 Rev 2.0; 525.2 Rev 2.0; 525.3			

Analyte	MCL/SCL	EPA	ASTM	SM	Other
Dalapon	0.2 mg/L	515.1 Rev 4.0; 515.3 Rev 1.0; 515.4 Rev 1.0; 552.1 Rev 1.0; 552.2 Rev 1.0; 552.3 Rev 1.0; 557		6640 B, 6640 B-01	
Dibromochloropropane (DBCP)	0.2 µg/L	504.1 Rev 1.1; 551.1 Rev 1.0; 524.3			
Di(2-ethylhexyl)adipate (DEHA)	400 µg/L	506 Rev 1.1; 525.2 Rev 2.0; 525.3			
Di(2-ethylhexyl)phthalate (DEHP)	6 µg/L	506 Rev 1.1; 525.2 Rev 2.0; 525.3			
Dinoseb	0.007 mg/L	515.1 Rev 4.0; 515.2 Rev 1.1; 515.3 Rev 1.0; 515.4 Rev 1.0; 555 Rev 1.0		6640 B, 6640 B-01	
Diquat	0.02 mg/L	549.2 Rev 1.0			
Endothall	0.1 mg/L	548.1 Rev 1.0			
Endrin	2 µg/L	505 Rev 2.1; 508 Rev 3.1; 508.1 Rev 2.0; 525.2 Rev 2.0; 525.3; 551.1 Rev 1.0			
Ethylenedibromide (EDB)	0.05 µg/L	504.1 Rev 1.1; 551.1 Rev 1.0; 524.3			
Glyphosate	0.7 mg/L	547		6651, 6651B, 6651B-00	
Heptachlor	0.4 µg/L	505 Rev 2.1; 508 Rev 3.1; 508.1 Rev 2.0; 525.2 Rev 2.0; 525.3; 551.1 Rev 1.0			
Heptachlor epoxide	0.2 µg/L	505 Rev 2.1; 508 Rev 3.1; 508.1 Rev 2.0; 525.2 Rev 2.0; 525.3; 551.1 Rev 1.0			
Hexachlorobenzene	1 µg/L	505 Rev 2.1; 508 Rev 3.1; 508.1 Rev 2.0; 525.2 Rev 2.0; 525.3; 551.1 Rev 1.0			
Hexachlorocyclopentadiene	50 µg/L	505 Rev 2.1; 508 Rev 3.1; 508.1 Rev 2.0; 525.2 Rev 2.0; 525.3; 551.1 Rev 1.0			

Analyte	MCL/SCL	EPA	ASTM	SM	Other
Lindane	0.2 µg/L	505 Rev 2.1; 508 Rev 3.1; 508.1 Rev 2.0; 525.2 Rev 2.0; 525.3; 551.1 Rev 1.0			
Methoxychlor	40 µg/L	505 Rev 2.1; 508 Rev 3.1; 508.1 Rev 2.0; 525.2 Rev 2.0; 525.3; 551.1 Rev 1.0			
Oxamyl (Vydate)	0.2 mg/L	531.1 Rev 3.1; 531.2 Rev 1.0		6610 B, 6610 B-04	
PCBs (as Arochlors)		505 Rev 2.1; 508 Rev 3.1; 508.1 Rev 2.0; 525.2 Rev 2.0; 525.3			
PCBs (as decachloro-biphenyl)	0.0005 mg/L	508A Rev 1.0			
Pentachlorophenol	0.001 mg/L	515.1 Rev 4.0; 515.2 Rev 1.1; 515.3 Rev 1.0; 515.4 Rev 1.0; 525.2 Rev 2.0; 525.3; 555 Rev 1.0	D5317-93, D5317-98	6640 B, 6640 B-01	
Picloram	0.5 mg/L	515.1 Rev 4.0; 515.2 Rev 1.1; 515.3 Rev 1.0; 515.4 Rev 1.0; 555 Rev 1.0	D5317-93, D5317-98	6640 B, 6640 B-01	
Simazine	4 µg/L	505 Rev 2.1; 507 Rev 2.1; 508.1 Rev 2.0; 523; 525.2 Rev 2.0; 525.3; 536; 551.1 Rev 1.0			
Toxaphene	3 µg/L	505 Rev 2.1; 508 Rev 3.1; 508.1 Rev 2.0; 525.2 Rev 2.0; 525.3			
Volatile Organic Chemicals §290.107					
Benzene	5 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3, 524.4			
Carbon tetrachloride	5 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3; 524.4, 551.1 Rev 1.0			
Chlorobenzene	100 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3, 524.4			
1,2-Dichlorobenzene	600 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3, 524.4			
1,4-Dichlorobenzene	75 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3, 524.4			

Analyte	MCL/SCL	EPA	ASTM	SM	Other
1,2-Dichloroethane	5 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3, 524.4			
cis-Dichloroethylene	70 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3, 524.4			
trans-Dichloroethylene	100 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3, 524.4			
Dichloromethane	5 µg/L	502.2; 524.2, 524.4			
1,2-Dichloropropane	5 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3, 524.4			
Ethylbenzene	700 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3, 524.4			
Styrene	100 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3, 524.4			
Tetrachloroethylene	5 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 551.1 Rev 1.0; 524.3, 524.4			
1,1,1-Trichloroethane	200 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3; 524.4, 551.1 Rev 1.0			
Trichloroethylene	5 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 551.1 Rev 1.0, 524.3, 524.4			
Toluene	1000 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3, 524.4			
1,2,4-Trichlorobenzene	70 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3, 524.4			
1,1-Dichloroethylene	7 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3, 524.4			
1,1,2-Trichloroethane	5 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3; 551.1 Rev 1.0, 524.4			
Vinyl chloride	2 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3, 524.4			
Xylenes (Total)	10000 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.3, 524.4			

Analyte	MCL/SCL	EPA	ASTM	SM	Other
Disinfection Byproducts §290.113, §114, §115					
Bromate	0.010 mg/L	300.1 Rev 1.0, 317 Rev 2.0, 321.8, 326 Rev 1.0	D6581-00		
Chlorite (in Distribution System)	1.0 mg/L	300.0 Rev 2.1; 300.1 Rev 1.0; 317.0 Rev 2.0; 326.0 Rev 1.0	D6581-00		
THM (Total)	80 µg/L	502.2 Rev 2.1; 524.2 Rev 4.1; 524.4; 551.1 Rev 1.0			
HAA5 (Total)	60 µg/L	552.1 Rev 1.0, 552.2 Rev 1.0; 552.3 Rev 1.0		6251 B & 6251B-94	
Radio Chemicals §290.108					
Gamma emitters		901.0; 901.1; 902.0; Page 92 in EMSL LV 053917	D3649-06; D3649-91, D3649-98a; D4785-00a, D4785-08; D4785-93	7120; 7120-97; 7500-Cs B & B-00; 7500-I B & B-00	DHS: 4.5.2.3, Ga-01-R; USGS: R-1110-76
Gross alpha	15 pCi/L	EPA 00-02		7110 C & C-00	
Gross alpha & beta		EPA 00-01; 900.0; Page 1 in EMSL LV 053917; Page 1 in EPA 600/4-75-008		302; 7110 B & B-00	USGS: R-1120-76
Radium (Ra) 226		903.0; 903.1; EPA Ra-03; EPA Ra-04; Page 13 in EPA 600/4-75-008; Page 16 in EPA 600/4-75-008; Page 19 in EMSL LV 053917	D2460-07, D2460-97; D3454-05, D3454-97	304; 305; 7500-Ra B & B-01, C & C-01	DHS: Ra-04, Ra-05; GIT: GA; NYDOH: NY; USGS: R-1140-76, R-1141-76
Radium (Ra) 228		904.0; EPA Ra-05; Page 19 in EMSL LV 053917; Page 24 in EPA 600/4-75-008		7500 Ra D & D-01	DHS: Ra-05; GIT: GA; NJDEP: NJ; NYDOH: NY; USGS: R-1142-76
Strontium (Sr) 89 & 90		905.0; EPA Sr-04; Page 29 in EPA 600/4-75-008; Page 65 in EMSL LV 053917		303, 7500-Sr B & B-01	DHS: Sr-01, Sr-02; USGS: R-1160-76
Tritium		906.0; EPA H-02; Page 34 in EPA 600/4-75-008; Page 87 in EMSL LV 053917	D4107-08, D4107-91, D4107-98	306; 7500-3H B, 7500-3H B-00	USGS: R-1171-76
Uranium (U)	30 µg/L	200.8 Rev 5.4; EPA 00-07; 908.0; 908.1; Page 33 in EMSL LV 053917	D2907-97, D3972-02; D3972-09; D3972-97; D5174-02, D5174-07; D5174-97; D5673-03, D5673-05, D5673-10; D6239-09	3125; 3125, 21st Ed.; 7500-U B & B-00, C & C-00	DHS: U-02, U-04; USGS: R-1180-76, R-1181-76, R-1182-76

Appendix

E

Sample Location (Tap) Abbreviations

Common 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

CODE	DESCRIPTION
AR	Agency Rejected (TCEQ Use Only)
BR	Broken in Transit
BP	Invalid Sample Point
CA	Cancel Test
CI	Can't ID
CL	Chlorine Present
CM	Chain of Custody - Missing Sample
CN	Chain of Custody Not Signed
CP	Cancelled (Payable)
EH	Exceeded Hold Time
FZ	Sample Frozen
HS	Excess Head Space
IC	Invalid Container
ID	Invalid Date/Time
IF	Invalid Field Measurement
IN	Insufficient Sample Information
PR	Improperly Reserved
IP	Invalid Sampling Protocol
LA	Lab Accident
LE	Lab Error / Lab QC Failure
LT	Leaked In Transit
MF	Submission form and chain of custody do not match
MP	Missing pH (when required)
MT	Multiple Tests Requested
NC	No Chlorine Residual
ND	No Date/Time
NM	Not Measured
NR	No Sample Received
NS	No Sampler Signature
NT	No Test Specified
PH	pH Out of range
PS	No PWS Representative Signature
QC	QA/QC
QI	Quantity Insufficient
RL	Reporting Limit not met
RS	Redundant Sample
SB	Custody Seal Broken/Tampered
SE	Shipping Error
SM	Custody Seal Missing
TH	Temperature Too High
TN	Test Not Available
VO	Insufficient Volume
WL	Wrong Location

Appendix

G

List of Counties and Regions

All PWS ID numbers begin with a three digit county code (listed below).

001-Anderson	5	052-Crane	7	108-Hidalgo	15	163-Medina	13	218-Sutton	8
002-Andrews	7	053-Crockett	8	109-Hill	9	164-Menard	8	219-Swisher	1
003-Angelina	10	054-Crosby	2	110-Hockley	2	165-Midland	7	220-Tarrant	4
004-Aransas	14	055-Culberson	6	111-Hood	4	166-Milam	9	221-Taylor	3
005-Archer	3	056-Dallms	1	112-Hopkins	5	167-Mills	9	222-Terrell	7
006-Armstrong	1	057-Dallas	4	113-Houston	10	168-Mitchell	3	223-Terry	2
007-Atascosa	13	058-Dawson	7	114-Howard	7	169-Montague	3	224-Throckmorton	3
008-Austin	12	059-Deaf Smith	1	115-Hudspeth	6	170-Montgomery	12	225-Titus	5
009-Bailey	2	060-Delta	5	116-Hunt	4	171-Moore	1	226-Tom Green	8
010-Bandera	13	061-Denton	4	117-Hutchinson	1	172-Morris	5	227-Travis	11
011-Bastrop	11	062-De Witt	14	118-Irion	8	173-Motley	2	228-Trinity	10
012-Baylor	3	063-Dickens	2			174-Nacogdoches	10	229-Tyler	10
013-Bee	14	064-Dimmit	16	119-Jack	3	175-Navarro	4	230-Upshur	5
014-Bell	9	065-Donley	1	120-Jackson	14	176-Newton	10	231-Upton	7
015-Bexar	13	066-Duval	16	121-Jasper	10	177-Nolan	3	232-Uvalde	13
016-Blanco	11	067-Eastland	3	122-Jeff Davis	6	178-Nueces	14	233-Val Verde	16
017-Borden	7	068-Ector	7	123-Jefferson	10	179-Ochiltree	1	234-Van Zandt	5
018-Bosque	9	069-Edwards	13	124-Jim Hogg	15	180-Oldham	1	235-Victoria	14
019-Bowie	5	070-Ellis	4	125-Jim Wells	14	181-Orange	10	236-Walker	12
020-Brazoria	12	071-El Paso	6	126-Johnson	4	182-Palo Pinto	4	237-Waller	12
021-Brazos	9	072-Erath	4	127-Jones	3	183-Panola	5	238-Ward	7
022-Brewster	6	073-Falls	9	128-Karnes	13	184-Parker	4	239-Washington	9
023-Briscoe	1	074-Fannin	4	129-Kaufman	4	185-Parmer	1	240-Webb	16
024-Brooks	15	075-Fayette	11	130-Kendall	13	186-Pecos	7	241-Wharton	12
025-Brown	3	076-Fisher	3	131-Kenedy	15	187-Polk	10	242-Wheeler	1
026-Burleson	9	077-Floyd	2	132-Kent	3	188-Potter	1	243-Wichita	3
027-Burnet	11	078-Foard	3	133-Kerr	13	189-Presidio	6	244-Wilbarger	3
028-Caldwell	11	079-Fort Bend	12	134-Kimble	8	190-Rains	5	245-Willacy	15
029-Calhoun	14	080-Franklin	5	135-King	2	191-Randall	1	246-Williamson	11
030-Callahan	3	081-Freestone	9	136-Kinney	16	192-Reagan	8	247-Wilson	13
031-Cameron	15	082-Frio	13	137-Kleberg	14	193-Real	13	248-Winkler	7
032-Camp	5	083-Gaines	7	138-Knox	3	194-Red River	5	249-Wise	4
033-Carson	1	084-Galveston		139-Lamar	5	195-Reeves	7	250-Wood	5
034-Cass	5	12085-Garza	2	140-Lamb	2	196-Refugio	14	251-Yoakum	2
035-Castro	1	086-Gillespie	13	141-Lampasas	9	197-Roberts	1	252-Young	3
036-Chambers	12	087-Glasscock	7	142-La Salle	16	198-Robertson	9		
037-Cherokee	5	088-Goliad	14	143-Lavaca	14	199-Rockwall	4		
038-Childress	1	089-Gonzales	14	144-Lee	11	200-Runnels	3	253-Zapata	16
039-Clay	3	090-Gray	1	145-Leon	9	201-Rusk	5	254-Zavala	16
040-Cochran	2	091-Grayson	4	146-Liberty	12				
041-Coke	8	092-Gregg	5	147-Limestone	9	202-Sabine	10		
042-Coleman	3	093-Grimes	9	148-Lipscomb	1	203-San Augustine	10		
043-Collin	4	094-Guadalupe	13	149-Live Oak	14	204-San Jacinto	10		
044-Collingsworth	1	095-Hale	2	150-Llano	11	205-San Patricio	14		
045-Colorado	12	096-Hall	1	151-Loving	7	206-San Saba	9		
046-Comal	13	097-Hamilton	9	152-Lubbock	2	207-Schleicher	8		
047-Comanche	3	098-Hansford	1	153-Lynn	2	208-Scurry	3		
048-Concho	8	099-Hardeman	3	154-McColloch	8	209-Shackelford	3		
049-Cooke	4	100-Hardin	10	155-McLennan	9	210-Shelby	10		
050-Coryell	9	101-Harris	12	156-McMullen	16	211-Sherman	1		
051-Cottle	3	102-Harrison	5	157-Madison	9	212-Smith	5		
		103-Hartley	1	158-Marion	5	213-Somervell	4		
		104-Haskell	3	159-Martin	7	214-Starr	15		
		105-Hays	11	160-Mason	8	215-Stephens	3		
		106-Hemphill	1	161-Matagorda	12	216-Sterling	8		
		107-Henderson	5	162-Maverick	16	217-Stonewall	3		

Appendix

H

Field Measurement Procedures

Chlorine measurement using the Hach Pocket Colorimeter™ II

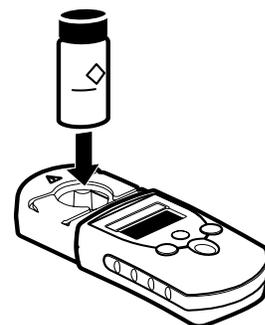
The following instructions are specific to the Mid-Range/High-Range Hach Pocket Colorimeter II (Model 5870062). Consult your specific manufacturer's operating guidelines if you are using any other model, brand or type of instrument.

PRECAUTIONS:

1. Collect samples to be measured directly in the sample cell.
2. A dedicated sample cell should be used for free chlorine and another for total chlorine.
3. Rinse sample cells thoroughly between uses with at least 3-5 volumes of fresh clean water.
4. Lint free wipes should 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 3 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 3-5 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 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 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 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 mid-range. Proceed to the high-range procedure.



POWER Button

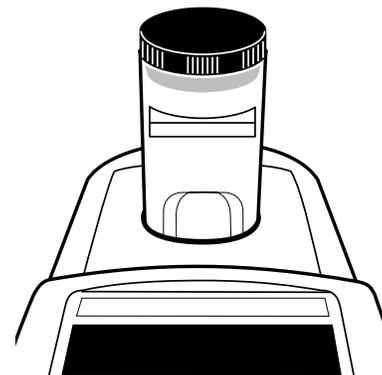


ZERO Button

READ/ENTER
Button

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 3-5 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 2. This is your final concentration.

Chlorine Dioxide measurement using the Hach Pocket Colorimeter™ II

The following instructions are specific to the Hach Pocket Colorimeter II. Consult your specific manufacturer's operating guidelines if you are using any other model, brand or type of instrument.

PRECAUTIONS:

1. Chlorine dioxide (ClO_2) samples must be analyzed immediately after collection to minimize loss of chlorine dioxide.
2. Do not use plastic sample containers for measurement or collection.
3. Use dedicated sample cells for chlorine dioxide.
4. If the chlorine dioxide concentration exceeds the upper limit of the test (5.00 mg/L ClO_2), the color will not develop properly. The display will show over range (flashing 5.50) when the concentration is 5.50 or more. If the reading is over 5.00, record "> 5.00 mg/L ClO_2 " on your sample form. Do not dilute samples.
5. Rinse sample cells thoroughly between uses with at least 3-5 volumes of fresh clean water.
6. Lint free wipes should be used to clean the sample cells before measurement.
7. Gently swirl samples to mix reagents. **Do not shake** sample cells. **Do not invert** sample cells. Vigorous agitation may cause loss of volatile chlorine dioxide before it can react.
8. For accurate measurements, you MUST wait the appropriate length of time before reading the sample cell.
9. Allow any unreacted reagent to settle before taking readings.
10. Check the reagent blank for each new lot and at least every two months. Make this adjustment by using deionized water in the procedure instead of sample and subtract that reading from future test results. See manufacturers guidelines for specifics.

Measuring Chlorine Dioxide (0.05 – 5.00 mg/L)

1. Rinse the glass sample cell with 3-5 volumes of sample water.
2. Collect 10 mL of water in a clean sample cell.
3. Press the power button to turn on the pocket colorimeter.
4. 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.
5. Press the ZERO button. The display will show " - - - " followed by "0.00". The meter has now been blanked.
6. Remove the sample cell. Empty the contents of the cell and refill with 10 mL of sample water.
7. Immediately add 4 drops of glycine reagent and **swirl gently** to mix (see PRECAUTIONS).
8. Immediately add the contents of one chlorine dioxide DPD powder pillow to the sample cell.
9. Cap and swirl the sample cell gently for 20 seconds. Wait 30 seconds for undissolved powder to settle.
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.
11. Press the READ/ENTER button **within one minute** after adding the DPD pillow. The display will show " - - - " followed by the results in mg/L.
12. Record the results on the PWS Water Analysis form in the COMMENTS section using the following format: "#.## mg/L ClO_2 "
13. If you obtain results that are flashing (5.50) after pressing the READ/ENTER button, or the concentration reads higher than 5.00, then record "> 5.00 mg/L ClO_2 " on the sample form.

Appendix

I

Detection Limits and Analyte Codes

EPA Drinking Water regulations require that certain analytes have minimum detection limits or minimum reporting levels. The following table includes minimum detection limits or reporting levels for regulated or screened contaminants, and lists other monitored contaminants that do not have required detection limits. EPA analyte codes are included as well.

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
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

Synthetic Organic Contaminants - SOC Group 5 Methods 525.2 & 508.1

MCL

Detection Limit
[40 CFR §141.24(h)(7), (10)(i) & (18)]

	ppm (mg/L)	ppb (µg/L)	ppm (mg/L)	ppb (µg/L)	Analyte Code
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
Hexachlorocyclopentadiene	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

	MCL		Detection Limit [40 CFR §141.24(h)(13)]		Analyte Code
	ppm (mg/L)	ppb (µg/L)	ppm (mg/L)	ppb (µg/L)	
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
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

Synthetic Organic Contaminants - EDB/DBCP Method 504.1

	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					
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
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

Radioactive Contaminants

	Detection Limit [40 CFR §141.25(c)(1) & (2)]		Analyte Code
	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	-	1	4006

Appendix

J

Laboratory Reporting of Analysis 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.

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, field measurements, etc. **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.

	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, precede 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	15

	Field name	Description	Data type	Field Size
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 (ie. 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 should 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 - HH:MM:SS	Text	8
16	B_SAMPLE_TYPE	<u>Sample type</u> "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	"FSD" for first draw, otherwise blank		
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	<u>Water temperature unit</u> "F" - Fahrenheit "C" - Celcius	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)		

	Field name	Description	Data type	Field Size
38	B_ORIGINAL_LABORATORY_CERTIFICATION_ID	Original lab certification ID (if replacing a previously rejected sample)		
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 should only be created if a result is available. If an entire sample is rejected and not analyzed, no result records should be reported, only report the single sample record. If a field blank is collected but not analyzed, report the single sample record -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 can not be reported, the entire sample should 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.

	Field name	Description	Data type	Field Size
1	B_FILE_NAME	Default to "result"	Text	6
2	B_RECORD_ID	Autonumber, unique	AutoNumber	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, precede 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	15
8	B_ANALYTE_CODE	EPA 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 - HH:MM:SS	Text	8
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 - HH:MM:SS	Text	8
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

	Field name	Description	Data type	Field Size
18	B_VOLUME_ASSAYED	NOT USED		
19	B_LAB_REJECTION_REASON	Rejection reason specific to result (if applicable, see Appendix F)	Text	2
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 should 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 should 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 should 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

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USPS Address Abbreviations

Addresses should conform to USPS abbreviation standards when applicable

WORD	ABBREVIATION
Annex	ANX
Apartment	APT
Avenue	AVE
Bluff	BLF
Boulevard	BLVD
Branch	BR
Bridge	BRG
Brook	BRK
Building	BLDG
Bypass	BYP
Canyon	CYN
Causeway	CSWY
Center	CTR
Circle	CIR
Court	CT
Cove	CV
Creek	CRK
Crossing	XING
Department	DEPT
Drive	DR
East	E
Expressway	EXPY
Extension	EXT
Field	FLD
Floor	FL
Forest	FRST
Fork	FRK
Fort	FT
Freeway	FWY
Grove	GRV
Heights	HTS
Highway	HWY
Hiway	HWY
Junction	JCT
Lane	LN

WORD	ABBREVIATION
Loop	LOOP
Motorway	MTWY
Mount	MT
Mountain	MTN
North	N
Northeast	NE
Northwest	NW
Number	NO
Parkway	PKWY
Place	PL
Point	PT
Ridge	RDG
Road	RD
Room	RM
Route	RTE
Saint	SAINT
South	S
Southeast	SE
Southwest	SW
Spring	SPG
Springs	SPGS
Square	SQ
Station	STA
Street	ST
Suite	STE
Terrace	TER
Trail	TRL
Trailer	TRLR
View	VW
Village	VLG
West	W

Appendix

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Contact Information and Resources

TCEQ Drinking Water Contacts

Drinking Water Quality Team	Phone number	E-mail
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Gary Regner - Drinking Water Compliance Sampling contract manager, QA Specialist, Organic Chemical Compliance, lab data, sample points	512-239-4528	Gary.Regner@tceq.texas.gov
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Donald Hunter - SWMOR	512-239-4661	Donald.Hunter@tceq.texas.gov
Laurie Gehlsen - Lead/Copper compliance	512-239-4660	Laurie.Gehlsen@tceq.texas.gov
Mia Gonzales - CCR, Chlorine dioxide, Bromate, Chlorite, DBPs	512-239-6576	Mia.Gonzales@tceq.texas.gov
Kasy Stinson - inorganic chemical compliance, contract backup	512-239-4722	Kasy.Stinson@tceq.texas.gov
Andrew Nidoh – Monitoring Plans	512-239-4611	Andrew.Nidoh@tceq.texas.gov
Nicole Larison – coliform samples (TCR)	512-239-6105	Nicole.Larison@tceq.texas.gov
James LaManna - Monitoring and Reporting violations, exceedance report tracking, field reports, scheduling	512-239-2374	James.LaManna@tceq.texas.gov

Drinking Water Watch - <http://dww2.tceq.texas.gov/DWW/>

Primary Compliance Laboratory

Texas Department of State Health Services (DSHS)**Laboratory Services Section**

Attn.: Specimen Acquisition

1100 W 49th St.

Austin, TX 78756

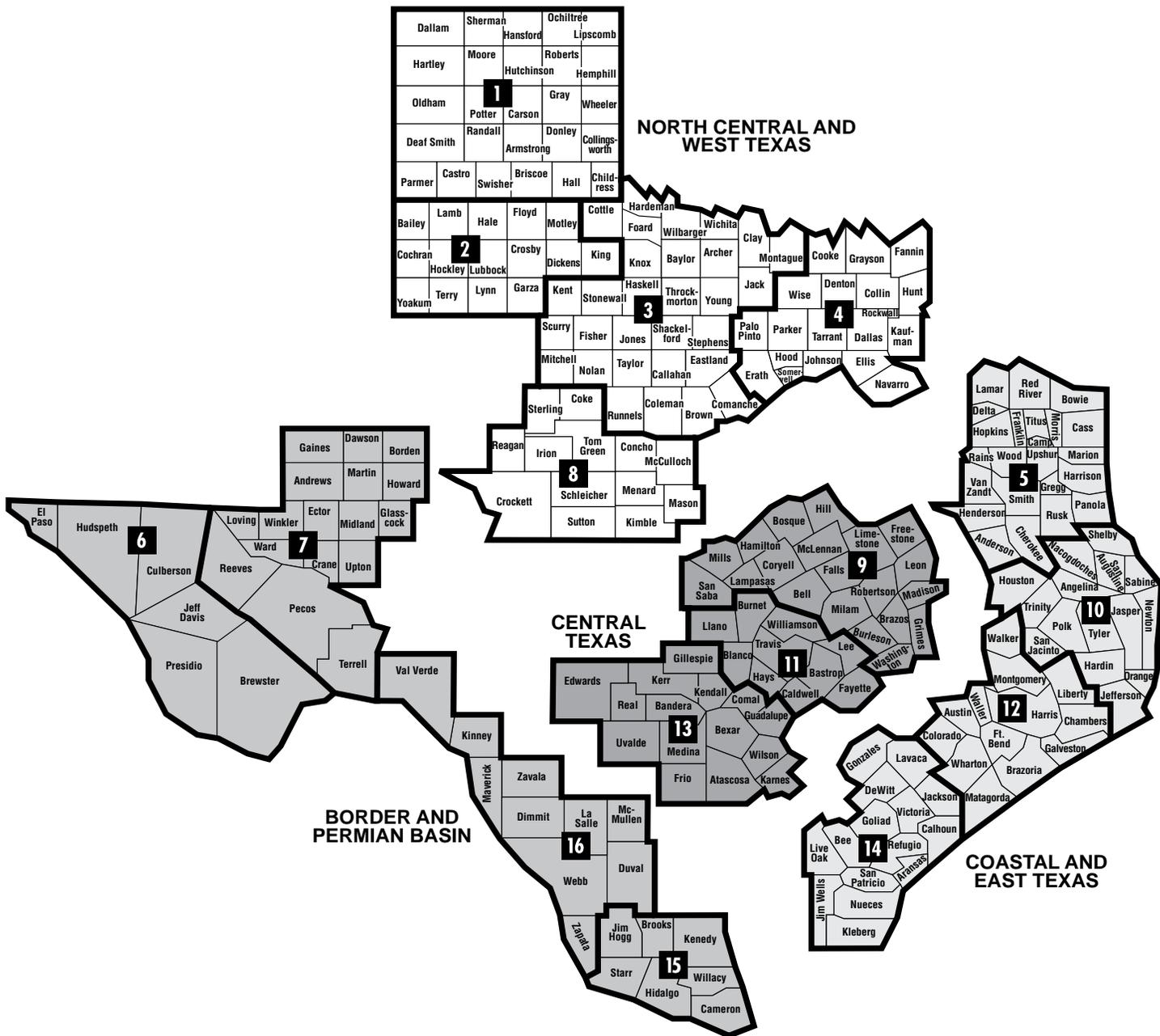
512-458-7111 (Darlene Ollinger {ext. 3476} or Lisa Simpson {ext. 2323} [Check In])

512-458-7111 ext. 3743 (Robert Morris [QA Officer])

512-776-7562 (Monica Kingsley [Microbiology])

512-776-3368 (Carl Hogberg [Environmental Sciences Branch Manager])

TCEQ AREAS & REGIONS



TCEQ REGIONS

- | | | | |
|----------------------------|---------------------|--------------------|--------------------------|
| 1 AMARILLO | 5 TYLER | 9 WACO | 13 SAN ANTONIO |
| 2 LUBBOCK | 6 EL PASO | 10 BEAUMONT | 14 CORPUS CHRISTI |
| 3 ABILENE | 7 MIDLAND | 11 AUSTIN | 15 HARLINGEN |
| 4 DALLAS/FORT WORTH | 8 SAN ANGELO | 12 HOUSTON | 16 LAREDO |

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Region 15, Harlingen • Region 16, Laredo

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956-425-6010 • FAX: 956-412-5059

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Region 9, Waco • Region 11, Austin • Region 13, San Antonio

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Region 1, Amarillo • Region 2, Lubbock • Region 3, Abilene
Region 4, Dallas/Fort Worth • Region 8, San Angelo

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Rio Grande Watermaster

Main Office
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Harlingen, TX 78550-5247
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FAX: 956-430-6052

Eagle Pass Office

P.O. Box 1185 • Eagle Pass, TX 78853-1185
1152 Ferry St., Ste. E & F
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South Texas Watermaster

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

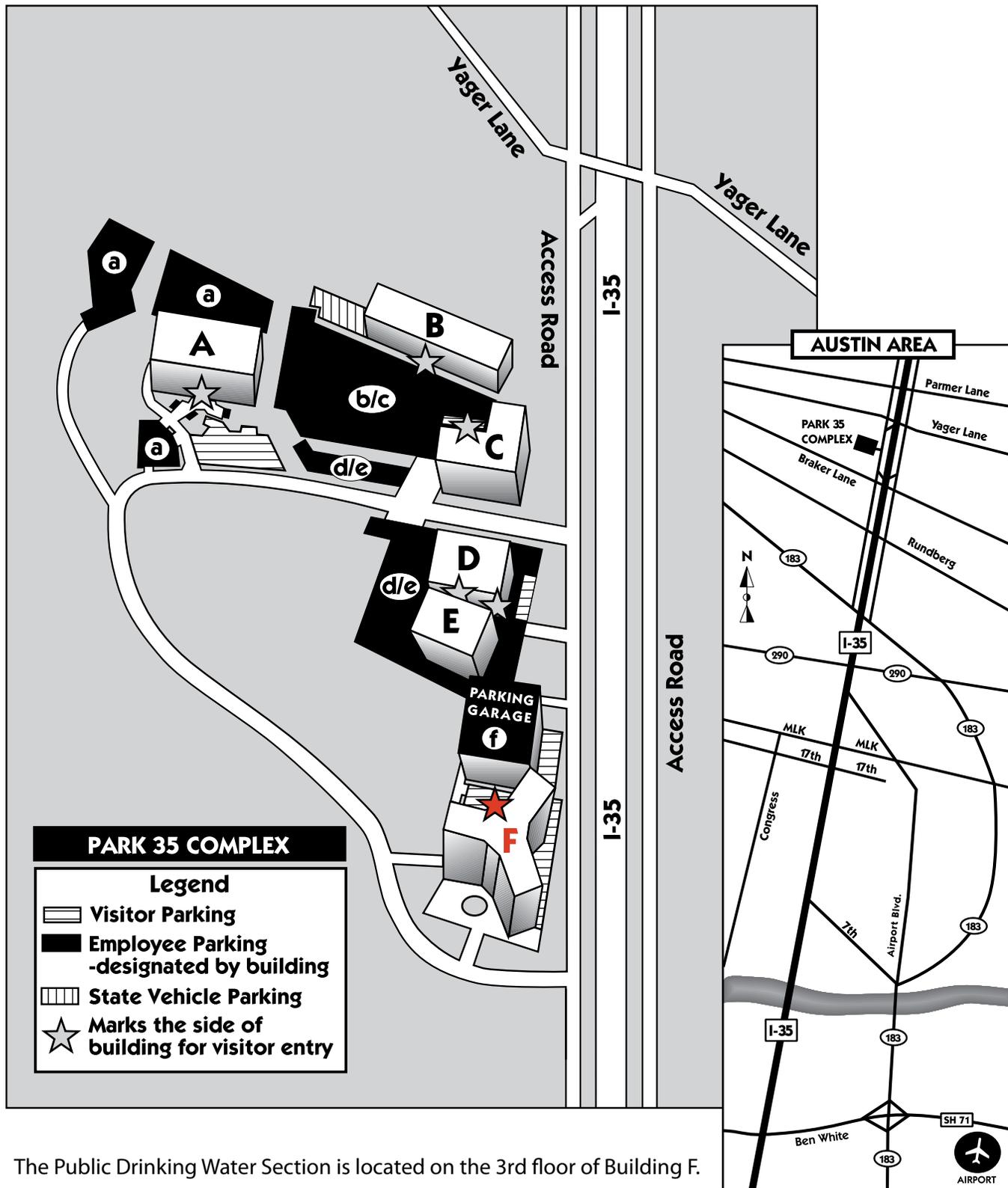
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GI-002 (Rev. 5/1/14)

TCEQ Park 35 Campus



The Public Drinking Water Section is located on the 3rd floor of Building F.

Appendix

M

Definitions and Acronyms

Definitions

- 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

AC	asbestos cement (pipe)	MUD	Municipal Utility District
BCAA	bromochloroacetic acid	MWD	Municipal Water District
BDL	below detection limit	NO ₂	nitrite
C	community (water system)	NO ₃	nitrate
CoC	chain of custody	NOM	natural organic matter
CCI	Comprehensive Compliance Inspection	NPDWR	National Primary Drinking Water Regulation
CCL	contaminant candidate list	NTNC	non-transient, non-community (water system)
CCR	Consumer Confidence Report	NTU	Nephelometric turbidity unit
CDBAA	chlorodibromoacetic acid	O	operational
CDS	combined distribution system	PAC	powdered activated carbon
CFR	Code of Federal Regulations	PDWS	Public Drinking Water Section
CWS	community water system	PE	professional engineer or performance evaluation
D	demand	POE	point of entry, aka entry point
DBP	disinfection byproduct	PPB	parts per billion, aka µg/L
DBP1	Stage 1 Disinfection Byproduct Rule	PPM	parts per million, aka mg/L
DBP2	Stage 2 Disinfection Byproduct Rule	PQL	practical quantitation limit
DCAA	dichloroacetic acid	PSI	pounds per square inch (pressure)
DI	deionized	PWS	Public Water System
DOC	dissolved organic carbon	PWSS	Public Water System Supervision
DPD	N,N-diethyl-p-phenylenediamine	QA	quality assurance
DSHS	Department of State Health Services	QAPP	Quality Assurance Project Plan
DWSG	Drinking Water Sampling Guide	QC	quality control
DWQ	Drinking Water Quality (Program)	QMP	Quality Management Plan
E	emergency	RAA	running annual average
EP	entry point	RG	regulatory guidance
EPA	Environmental Protection Agency	RO	reverse osmosis
EST	elevated storage tank	RT	retention time
FMT	Financial, Managerial and Technical (Assistance)	SCL	secondary constituent level
GAC	granular activated carbon	SDWA	Safe Drinking Water Act
GC	gas chromatograph	SDWIS	Safe Drinking Water Information System
GST	ground storage tank	SM	standard method
GUI	groundwater under the direct influence of surface water	SOC	synthetic organic chemical
HAA	haloacetic acid	SUVA	specific ultraviolet absorbance
HCO ₃	bicarbonate	SW	surface water
HPC	heterotrophic plate count	SWTP	surface water treatment plant
HR	high range	TAC	Texas Administrative Code
IDSE	Initial Distribution System Evaluation	TBAA	tribromoacetic acid
ISD	Independant School District	TCAA	trichloroacetic acid
IWUD	Integrated Water Utilities Database	TCEQ	Texas Commission on Environmental Quality
L	liter	TDS	total dissolved solids
LCRA	Lower Colorado River Authority	TEEX	Texas Engineering Extension Service
LRAA	locational running annual average	THM	trihalomethane
LSI	Langelier saturation index	TNC	transient non-community (water system)
MCL	maximum contaminant level	TNRCC	Texas Natural Resource Conservation Commission
MCLG	maximum contaminant level goal	TOC	total organic carbon
MDL	method detection limit	TTHM	total trihalomethanes
MG	milligram, aka ppm	UCMR	Unregulated Contaminant Monitoring Regulation
MOR	monthly operating report	UV	ultraviolet
MPA	microscopic particulate analysis, aka filtrate sample	UV ₂₅₄	absorbance of ultraviolet light at a wavelength of 254 nanometers
MRDL	maximum residual disinfectant limit	VOC	volatile organic chemical
MRDLG	maximum disinfectant residual limit goal	WCID	Water Control and Improvement District
MSDS	Material Safety Data Sheet	WSC	Water Supply Corporation
MTBE	methyl tert-butyl ether, a gasoline additive	WSD	Water Supply Division
		WUD	Water Utilities Database

Appendix

N

Texas Drinking Water Watch

The State of Texas uses the EPA developed and maintained Safe Drinking Water Information System (SDWIS) to manage public water system data and to conduct compliance. The public has access to this data through the Texas Drinking Water Watch website: <http://dww2.tceq.state.tx.us/DWW/>

This website offers live access to public water system data. 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:

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 .kml file 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 placemarks 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 placemark 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 Drinking Water Watch.

All placemarks 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.

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