

Groundwater Source Sampling

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Source Sampling Compliance

- Rule Exceptions
- Ground Water Rule (GWR)



Source Sampling

- Rule exceptions – monthly raw water sampling is often a condition to grant an exception request
- Exception denied; however, Technical Review and Oversight Team (TROT) identifies concerns
- TCEQ regional investigator has concerns with source, prescribes monthly raw sampling
- Source is possibly GUI (groundwater under influence of surface water)



TCEQ Source Codes

- Complete lab submission forms correctly -
ALWAYS use TCEQ Source Code to identify wells:

e.g., G1234567A



Lab Submission Form

TCEQ-Total Coliform Rule (TCR) Program Sample Submission Form
 TCEQ State Lab ID: TX-1
 Lab Name: PARK 35 LAB
 Lab Contact Information: _____



Sample Submitter

Lab Sample ID 2009-1 Date Received (mm/dd/yyyy) 05/01/2009
 Public Water System (PWS) ID 2271234 Report Date (mm/dd/yyyy) 05/02/2009
 (7 digit TCEQ ID)
 PWS Name PARK 35 WSC County TRAVIS
 Send sample results to: Name MATT COURT
 Address PARK 35
 City AUSTIN State TX Zip 78753
 Phone # (Area code) 512-555-1234
 Owner Operator Other

Sample Collection Data

Date Collected 5/1/09 Time Collected 9:00 AM PM
 Sample Site G2271234A - WELL 1 - FOR EXCEPTION
 Sampler JMC Sampler Phone # (Area Code) 512-555-1234
 # of samples collected on this date: 1

System Type	Sample Type (This area is only for PWSs.)	Water Source
<input checked="" type="checkbox"/> PWS	<input type="checkbox"/> Routine Distribution	<input checked="" type="checkbox"/> Groundwater Well
<input type="checkbox"/> Private	<input checked="" type="checkbox"/> Raw: <u>G2271234A</u>	Well Depth: <u>217'</u>
<input type="checkbox"/> Other	<input type="checkbox"/> Construction	<input type="checkbox"/> Surface Water (Lake/River)
	<input type="checkbox"/> Special	
	<input type="checkbox"/> Repeat: _____	
	<input type="checkbox"/> Other: _____	
	(Sample ID of originating routine distribution positive sample)	

Disinfectant Residual 1.20 mg/L Disinfectant Type Chloramine (Total) Chlorine (Free)
 (Maintaining the minimum disinfectant residual throughout the distribution system is mandatory. You must include the disinfectant residual on all distribution samples collected or your sample will be rejected.)

Analysis (This area is for laboratory use only.)

Test Method Used: _____

This sample is unsuitable for analysis and must be replaced within 24hrs of notification from lab. (Below you will find the reason why your sample was deemed unsuitable.)

Indicator Organisms:
 total coliform found not found Analyst: _____

fecal coliform/E. coli (Circle the fecal indicator found.) found not found

Repeat samples are required for all routine distribution samples that are found to contain indicator organisms.

Your sample is unsuitable because:

- Sample too old (exceeded the 30hr holding time.)
- Heavy silt, bacterial growth, or turbidity
- Insufficient sample volume (100mL required)
- Sample leaked in transit
- Submission form incomplete or incorrect
- Presence of excessive chlorine residual
- Other: _____

Submit PWS results to TCEQ Public Drinking Water MC-155, PO Box 13087, Austin, TX 78711 | Positive Results should be faxed to (512) 239-3666



Source Sampling Compliance

- TCEQ is developing source sampling compliance program similar to the Total Coliform Rule (TCR)
- Correspondence / Guidance begins in 2009



Monitoring Violation

- Public water system (PWS) fails to collect required monthly raw samples
- TCEQ issues notice of violation (NOV)
- If PWS fails to sample, exception reviewed for revocation



Source Evaluation

- If raw sample is positive, TCEQ issues guidance letter (including well disinfection procedures)
- If multiple raw positives, source evaluated for GUI status



Triggered Source Monitoring

- A positive distribution sample requires a sample from each active well
- PWS may sample only 'representative' wells

IF

Triggered Source Monitoring Plan approved
by TCEQ



Source Water Monitoring

CFR 141.402

- Required for all groundwater systems that do not provide 4-log treatment of viruses and has a coliform positive distribution sample (and result is not invalidated)
- Source sample must be collected from each active well within 24 hours



Triggered Source Monitoring Plan (TSMP)

TSMP describes representative wells

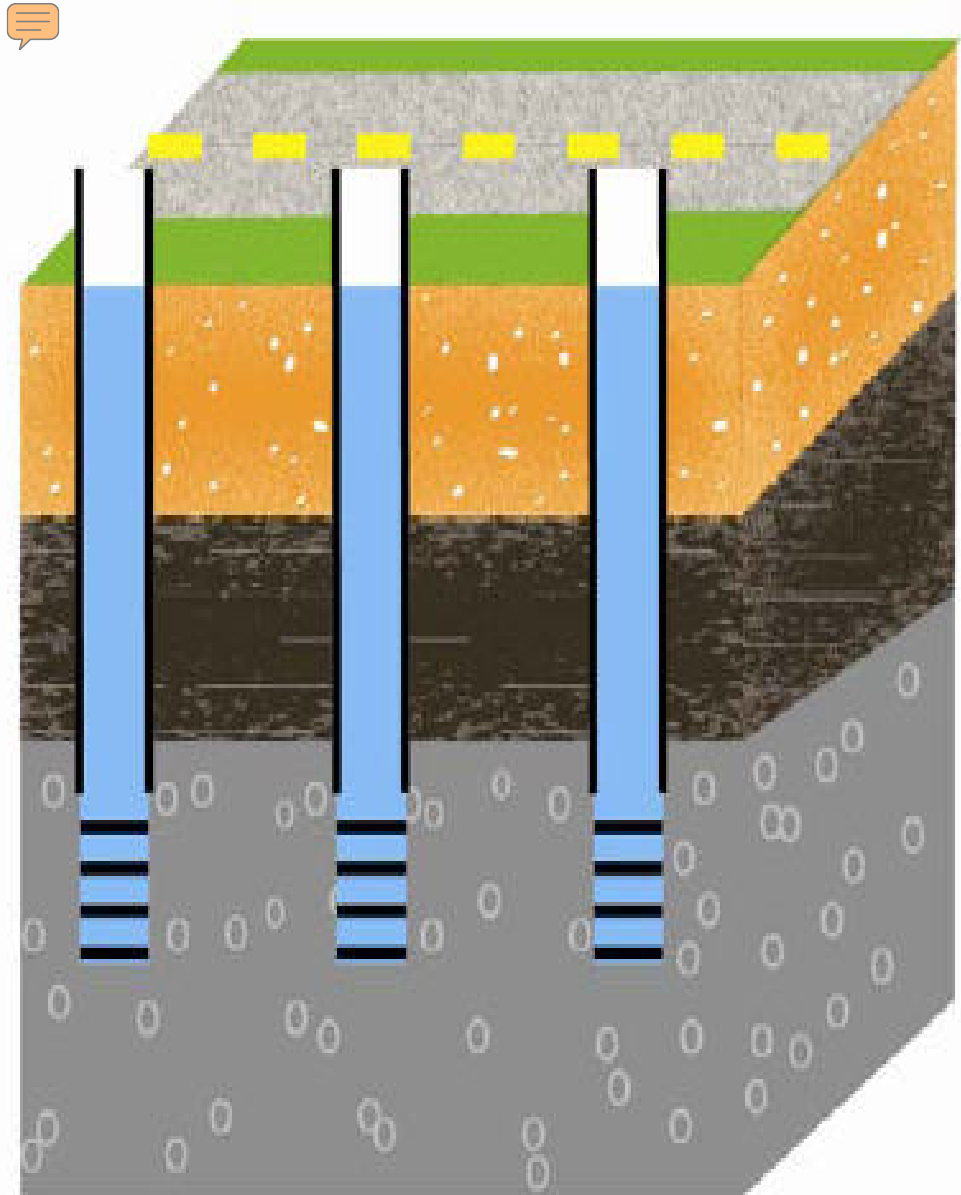
- Wells representing other wells
- Wells representing distribution sites



Representative Wells

- Wells that are representative of other wells
 - If well field contains several similar wells (same depth, aquifer, construction) PWS may select ONE well in well field to sample (rather than all wells)



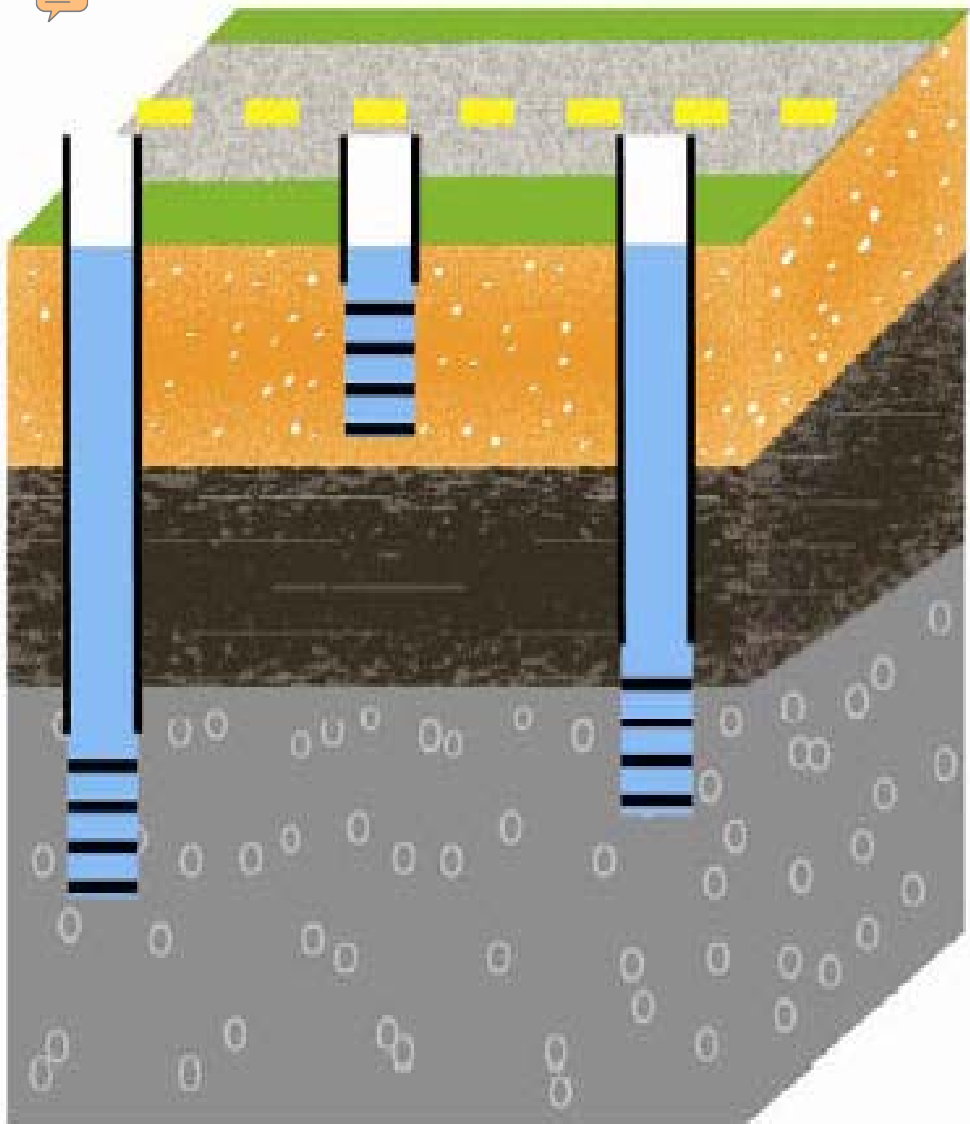


50 Feet

-  Sand
-  Clay
-  Gravel

Representative Wells - Acceptable





50 Feet

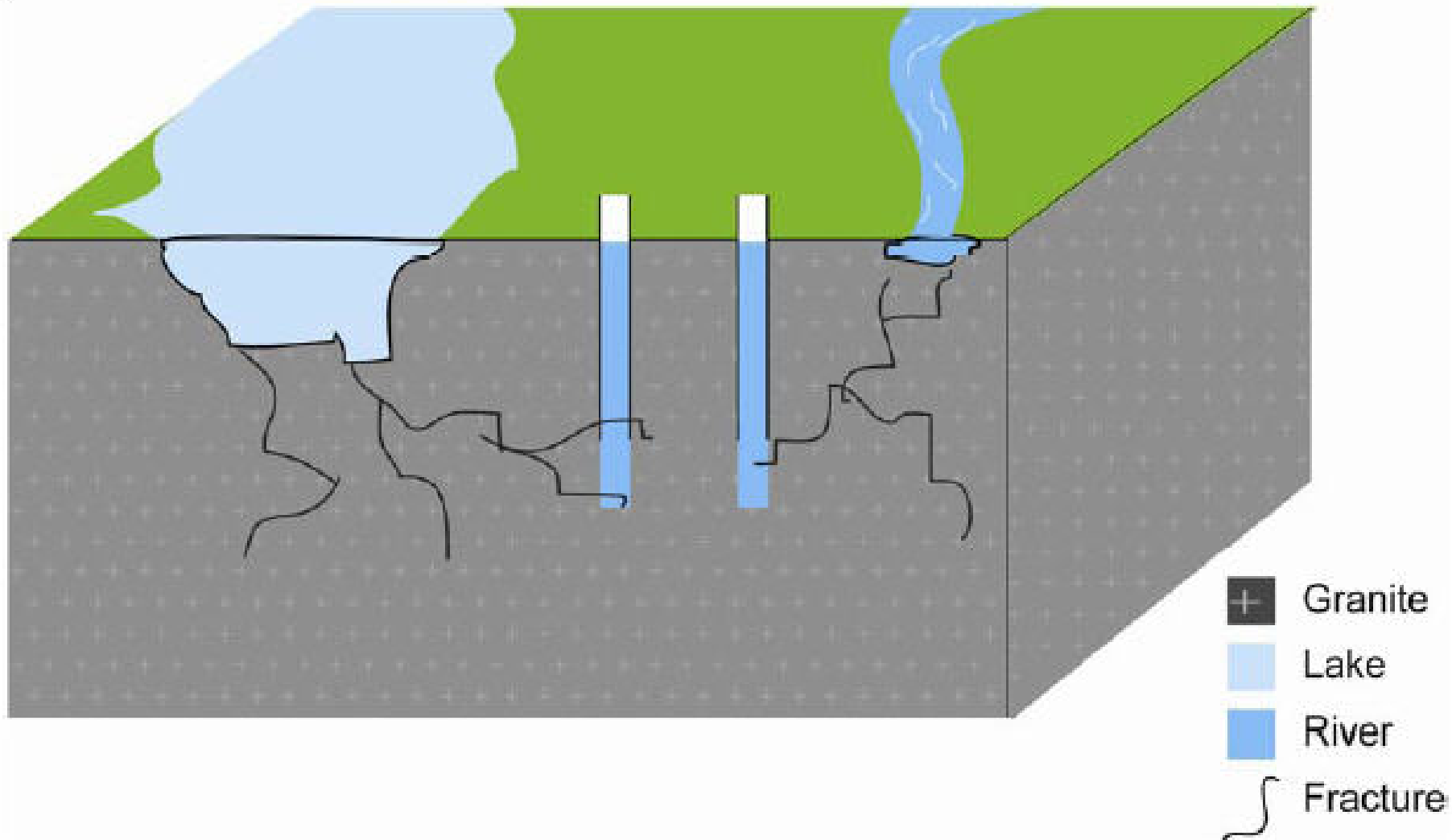
-  Sand
-  Clay
-  Gravel

Not Representative





Not Representative – Fractured Bedrock





Importance of Well Logs

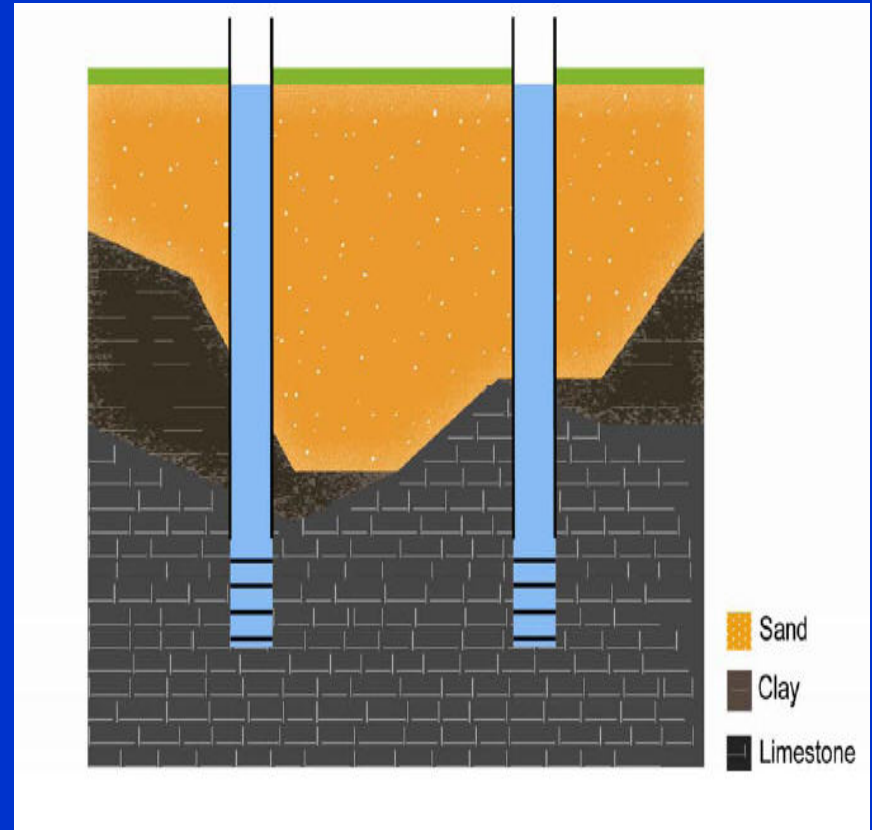
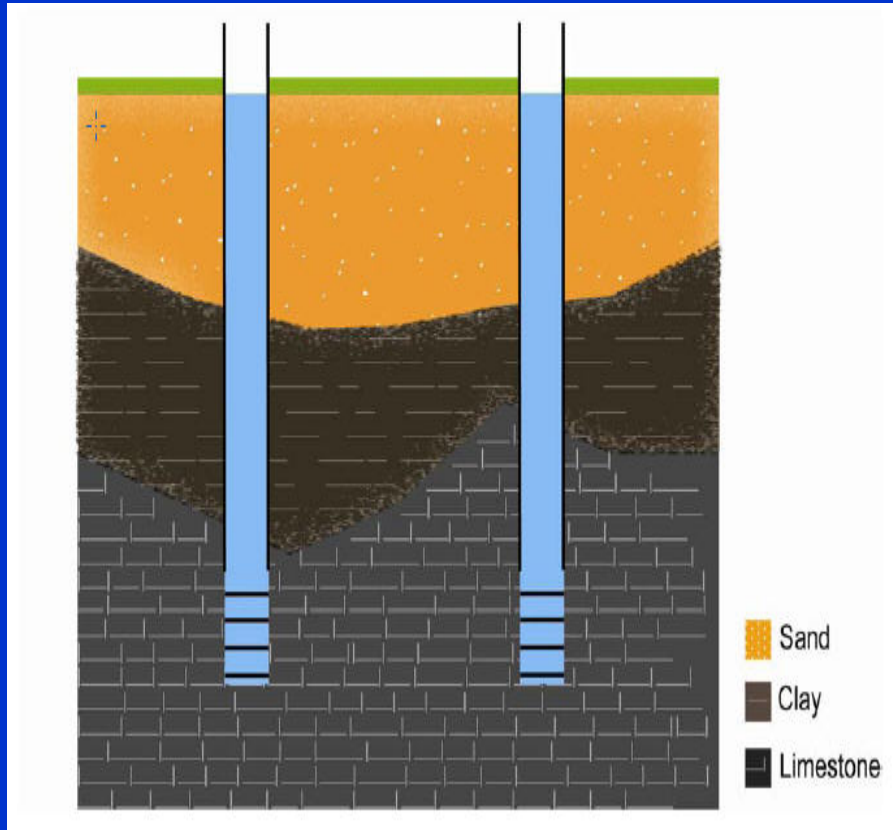


Table 2-7. Requirements for Representative Well Group Table

Well proposed to be sampled as representative of the group *	Backup Well ID	Source IDs of Wells Represented	Names of Wells Represented	Well Depth / Aquifer	Entry Point(s) associated with wells
The well that you propose to sample as representative of the group of wells.	Well to be sampled if primary representative well is offline.	TCEQ source IDs for wells that are proposed to be represented by the well listed in the first column.	System's name for well.	Depth of well / aquifer that those wells draw water from.	Usually a group of wells will feed the same entry point, but not always.

Table 2-8. Example of Representative Well Table (for One Group with Two Wells)

Representative Well ID	Backup Rep Well ID	Source IDs of Wells Represented	Names of Wells Represented	Well Depth / Aquifer	Entry Point(s) associated with wells
G1019999A	G1019999B	G1019999A	Well 1	Chicot / 280'	EP001
		G1019999B	Well 2	Chicot / 300'	

Table 2-9. Example of Representative Well Table (for Two Groups with Eight Wells)

Representative Well ID	Backup Rep Well ID	Source IDs of Wells Represented	Names of Wells Represented	Well Depth / Aquifer	Entry Point(s) associated with wells
G2550001A	G2550001B	G2550001A	Well 1	Glen Rose / 1233'	EP001
		G2550001B	Well 2	Glen Rose / 1200'	
		G2550001C	Well 3	Glen Rose / 1188'	
		G2550001D	Well 4	Glen Rose / 1046'	
G2550001D	G2550001E	G2550001E	Well 5	Trinity / 541'	EP002
		G2550001F	Well 6	Trinity / 540'	
		G2550001G	Well 7	Trinity / 555'	
		G2550001H	Well 8	Trinity / 539'	



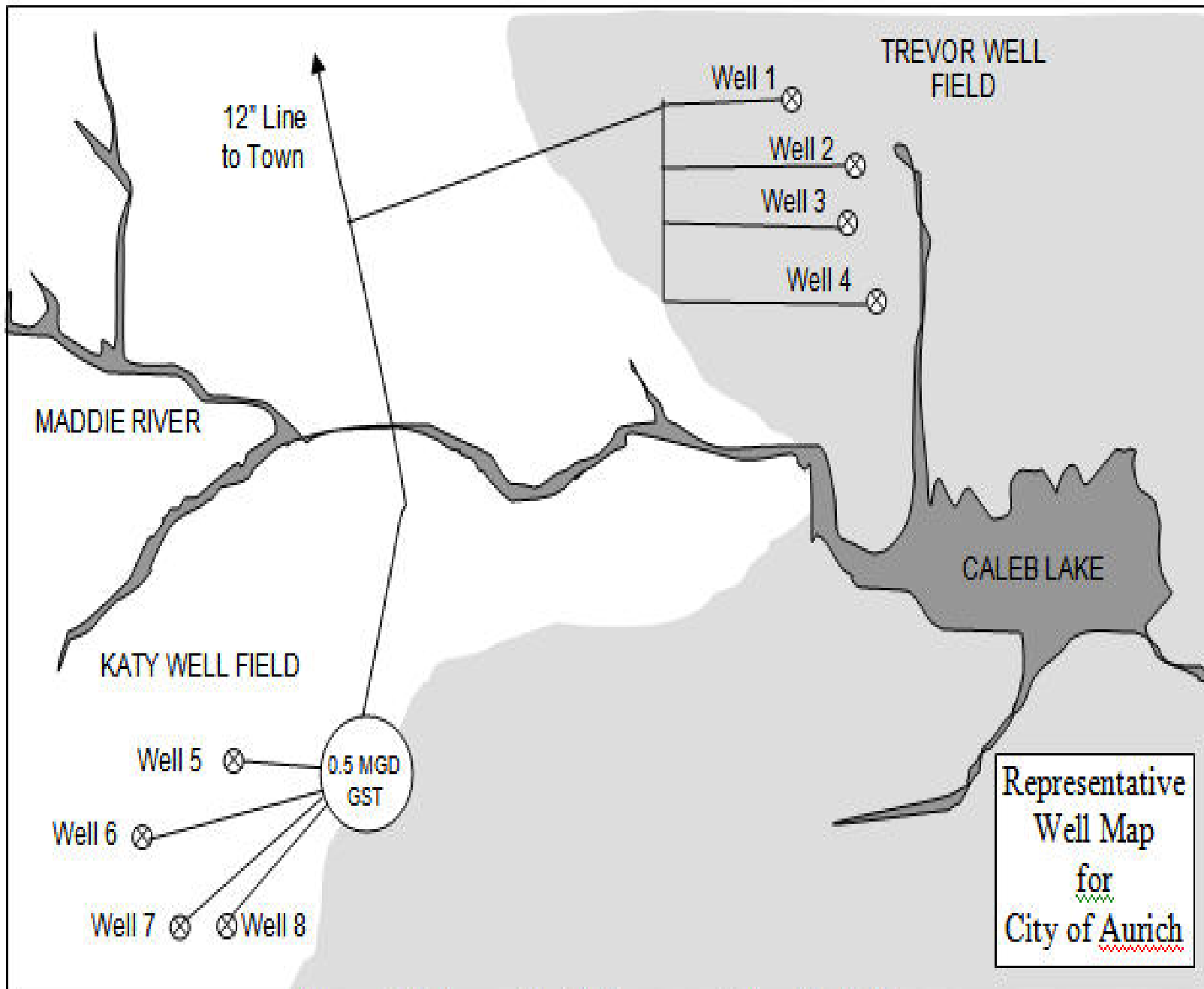
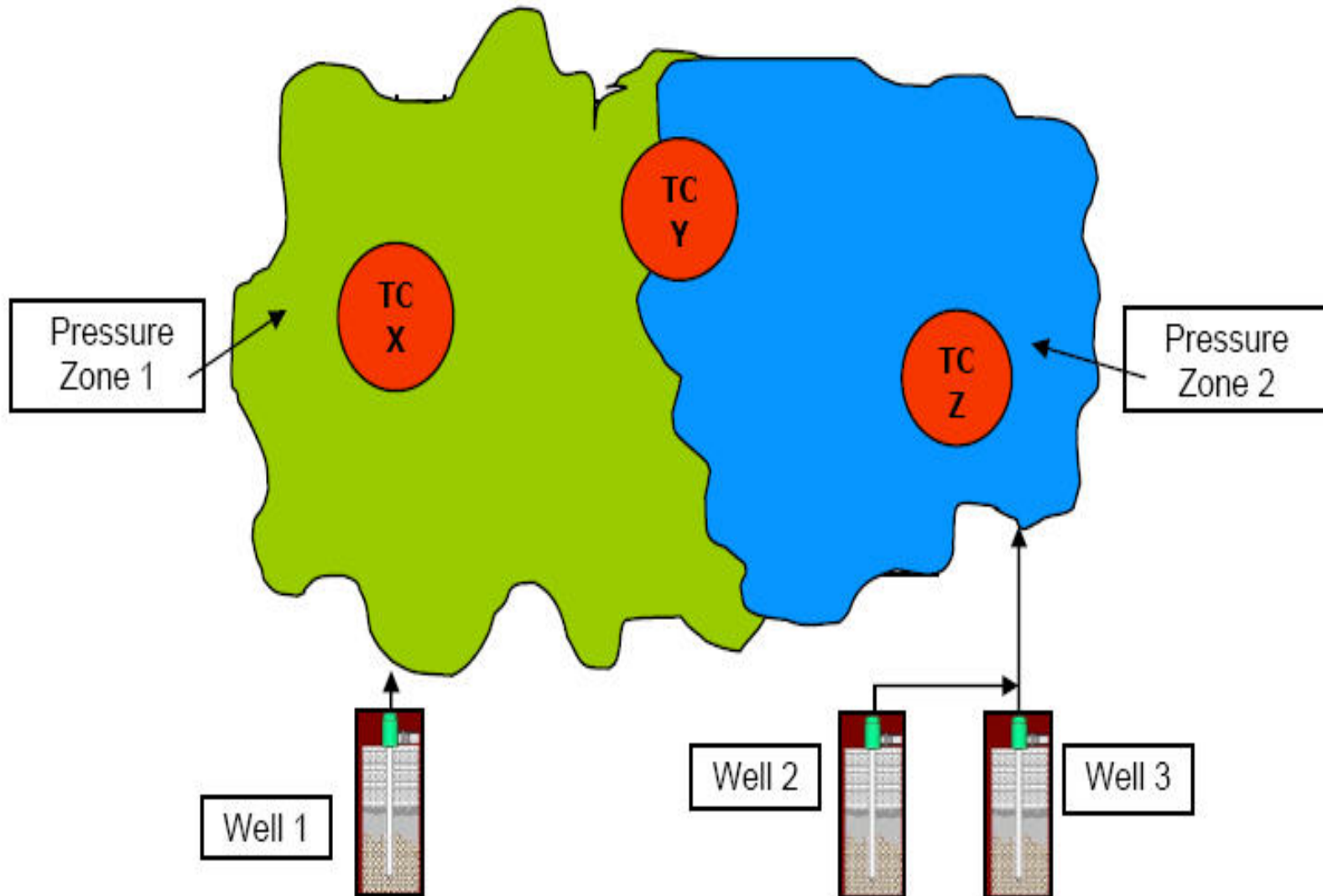


Figure 2.3 Example of Representative Well Map



Distribution System with Multiple Pressure Zones



Pressure Zone Table

TCR Site	Pressure Zone	Contributing Wells
1	South	South Ave Well 1 South Ave Well 2 Diehl Drive Well Main Well 1 Main Well 2 Main Well 3 West Side Well
2	North Central	Main Well 1 Main Well 2 Main Well 3
3	West Side	Main Well 1 Main Well 2 Main Well 3 West Side Well
4	West Side	Main Well 1 Main Well 2 Main Well 3 West Side Well



Table 2-1. Source Sample Site Table Field Definitions

Source	TCEQ Source ID	Sample Site	Notes
List the source(s). Use the system's name for the source.	The 9-digit code that you can find in TCEQ documentation. The first letter is a code for the type of source, then the 7-digit PWS ID, then a letter code to distinguish each unique source.	A brief description of the place where you sample the source water. For a well, this is often "Tap at Well Head," for a purchased water source it is often "Tap at Take Point," for a SWTP it is often "Lab Raw Tap."	Make any comments that are important. Note if the well is only used on an emergency basis. For emergency wells, note the 5-year sample cycle.

Table 2-2. Example Source Sample Site Table for a System with One Well

Source	TCEQ Source ID	Sample Site	Notes
Well 1	G3560046A	Wellhead	

Table 2-3. Example Source Sample Site Table for a System with Wells, Surface Water, and Purchased Water

Source	TCEQ Source ID	Sample Site	Notes
Well 1	G2550001A	Wellhead	Emergency (5-yr samples due in 2010)
Well 2	G2550001B	Wellhead	
Raging River	S2550001A	Raw sample tap in SWTP lab	
Purchased water from the City of Aguadulce	P2550001A	Sample station at 123 Elm Street	<u>Aguadulce PWS 2550003</u>



Table 2-4. Requirements for Source Monitoring Plan: Distribution Sites and Sources Link Table

Routine Distribution Coliform Sample Site	Entry point that feeds that site	Wells that feed that entry point
List all routine distribution coliform sites. This list should already be in your monitoring plan under the "Distribution" section. If the sites are numbered, include them.	List any entry points that feed each routine distribution coliform site. If that changes under different operating conditions, list all the entry points that might feed that part of the system. If you know that a site gets water from a different entry point in the summer and winter, note that.	List all the wells that feed each entry point. Include emergency and demand wells.

Table 2-5. Example of Source Monitoring Plan Distribution Sites and Sources Link Table Showing Various Types of Sources and Sites for Ground or Surface Water

Routine Distribution Coliform Sample Site	Entry Point that feeds that site	Wells that feed that Entry point
1 City Hall	EP001	Well 1 (emergency), Well 2
2 Fire Department		
3 123 Apple Street	EP002	Well 3
4 15401 Querca Street		
5 20 Industrial Park Road	EP003	Purchases treated ground water from Frio WSC (PWS 3210009)
6 456 Fleet Street (Operator's house – Alternate sample site)	EP001	Well 1 (emergency), Well 2

Table 2-6. Example of Source Monitoring Plan Distribution Sites and Sources Link Table For Figure 2-1, A Community PWS with Two Wells and Seven Coliform Sites

City of County Seat, Source Monitoring Plan			
Routine Distribution Coliform Sample Site		Well / EP	
		Summer Well 1 (demand)	Winter Well 2 Only
SS-A	Sample Station at 765 FM 4691	Well 1 / Entry Point 1	Well 2 / Entry Point 2
SS-B	Hose bib at NE corner of Court House	Well 2 / Entry Point 2	
SS-C	Sample Station at High School (Bldg 4)	Well 2 / Entry Point 2	
SS-D	Hose bib at SW corner of Middle School	Well 1 / Entry Point 1 or Well 2 / Entry Point 2	
SS-E	Sample Station at 987 S East Avenue	Well 2 / Entry Point 2	
SS-F	(alt) Hose bib at back of roadhouse	Well 1 / Entry Point 1	
SS-G	(alt) Hose bib on side of church	Well 2 / Entry Point 2	



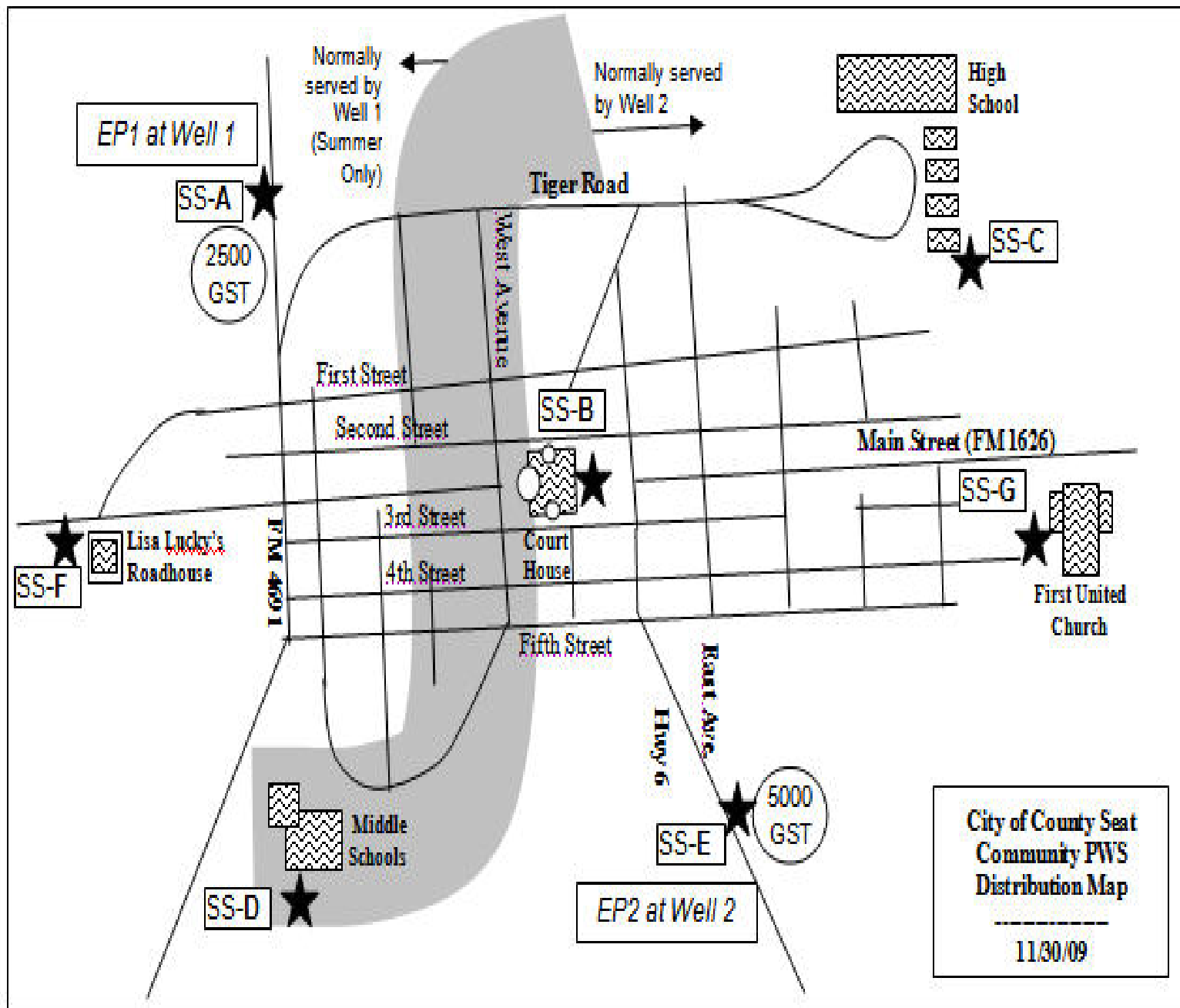


Figure 2-1. Example of Source Monitoring Plan Distribution Map



Data Required for Triggered Source Monitoring Plan

- Well logs
- Well output (gpm)
- Operational status of well
- Maps
- List of sources with raw monitoring requirements
- Tables



Summary

- Purpose of source monitoring of wells – protect public health!
- If PWS is required to sample wells for exceptions and/or GWR and multiple positives are collected, TCEQ will investigate source of contamination



Summary (cont.)

- Source may be a problem – new well or alternate source of water may be necessary
- Well could be under the influence of surface water (GUI)
- Additional treatment / disinfection may be necessary



Thank You

TCEQ

Public Drinking Water Section

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