

T E X A S
GROUNDWATER
PROTECTION
C O M M I T T E E

Report to the 86th Legislature



MEMBER AGENCIES

Texas Commission on Environmental Quality

Texas Water Development Board

Railroad Commission of Texas

Texas Department of State Health Services

Texas Department of Agriculture

Texas State Soil and Water Conservation Board

Texas Alliance of Groundwater Districts

Texas A&M AgriLife Research

Bureau of Economic Geology of
The University of Texas at Austin

Texas Department of Licensing and Regulation



State Capitol Building. State file photo.

Activities and Recommendations of the Texas Groundwater Protection Committee

Report to the 86th Legislature

Prepared by
Texas Groundwater Protection Committee

SFR-047/18

www.tceq.texas.gov/assets/public/comm_exec/pubs/sfr/047-18.pdf

January 2019



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Abbreviations

ACTF	Agricultural Chemicals Task Force
AgriLife Extension	Texas A&M AgriLife Extension Service
AgriLife Research	Texas A&M AgriLife Research
ASR	Aquifer Storage and Recovery
BEG	Bureau of Economic Geology of The University of Texas at Austin
DSHS	Texas Department of State Health Services
ET	Evapotranspiration
FAQs	Frequently Asked Questions
GCD	Groundwater Conservation District
GWI	Groundwater Issues (Subcommittee)
<i>Joint Report</i>	<i>Joint Groundwater Monitoring and Contamination Report</i>
OSSF	On-site Sewage Facility
LPST	Leaking Petroleum Storage Tank
PMP	Pesticide Management Plan
POE	Public Outreach and Education (Subcommittee)
POINTS	Pesticides of Interest Tracking System
QA	Quality Assurance
RRC	Railroad Commission of Texas
SMP	State Management Plan
<i>Strategy</i>	<i>Texas Groundwater Protection Strategy</i>
TAGD	Texas Alliance of Groundwater Districts
TCEQ	Texas Commission on Environmental Quality
TDA	Texas Department of Agriculture
TDLR	Texas Department of Licensing and Regulation
TDS	Total Dissolved Solids
TGPC or committee	Texas Groundwater Protection Committee
TNRCC	Texas Natural Resources Conservation Commission
TSSWCB	Texas State Soil and Water Conservation Board
TWDB	Texas Water Development Board
TWON	Texas Well Owner Network
USGS	United States Geological Survey
UWCD	Underground Water Conservation District
WCAC	Water Conservation Advisory Council
WSEP	Water Supply Enhancement Program

Executive Summary

This report describes the Texas Groundwater Protection Committee (TGPC) activities during 2017 and 2018, discusses selected groundwater protection issues, and provides recommendations to improve groundwater protection for the 86th Texas Legislature's consideration. The Texas Commission on Environmental Quality (TCEQ) prepared the report for the TGPC. The report fulfills the requirements of Texas Water Code, §26.405.

The TGPC has reviewed its statutory guidance and recommends that the legislature reconsider the TGPC's membership and review its present powers and duties. The recommendations include:

- Adding the Texas Parks and Wildlife Department as a TGPC member;
- Supporting the development of an electronic groundwater contamination case database;
- Amending language concerning pesticide management plans;
- Amending language concerning notice of groundwater contamination;
- Establishing an abandoned water well plugging fund; and,
- Supporting agency programs or initiatives concerning groundwater.

The state agency members of TGPC recommend favorable consideration of their appropriation requests that would provide funds necessary to carry out the existing groundwater protection programs.

During the biennium, the TGPC updated the *Texas Groundwater Protection Strategy (Strategy)* document (TCEQ publication AS-188, November 2018) which includes a summary of the dynamic and interactive processes by which information is exchanged and recommendations are made within and between the TGPC, its subcommittees, and the public in order to further protect groundwater resources in the state. The comprehensive strategy for protecting groundwater in Texas includes both the TGPC member's internal programs and the TGPC's internal processes outlined in the new edition of the *Strategy* document.

As indicated in the updated *Strategy* document, the Groundwater Issues (GWI) Subcommittee has begun developing white papers on the groundwater issues listed in their biannual *Activity Plan*.

The Public Outreach and Education (POE) Subcommittee has developed a total of 42 Frequently Asked Questions (FAQs). FAQs are the most cost-effective means of outreach and are posted on the TGPC website www.tgpc.texas.gov along with nine links to member agency FAQs. The POE Subcommittee continues to support statewide water well screening events and provides the public with groundwater information through exhibit booths at over a dozen conferences statewide.

The TGPC performed its quadrennial rules review and readopted its rules in April 2018.

As required by Texas Water Code, §26.406, the TGPC produced and published two annual *Joint Groundwater Monitoring and Contamination Reports (Joint Report)* during the previous two calendar years (TGPC, 2016 & 2017). Monitoring groundwater quality for regulatory requirements occurred in approximately 48,000 monitor wells statewide in 2017. The *Joint Report* documents a two-year decrease in cases: 3,444 groundwater contamination cases in 2016 and 3,426 cases in 2017. The most common contaminants originated from leaking petroleum storage tanks (LPSTs). For 2017, about 84 percent of the cases were under TCEQ jurisdiction and 16 percent were under Railroad Commission of Texas (RRC) jurisdiction. During fiscal years 2017 and 2018, the TCEQ mailed 520 notices for 59 cases of groundwater contamination that might affect private drinking water wells. The TGPC adopted the notice format in 2003.

The Agricultural Chemicals Task Force (ACTF), as part of the GWI Subcommittee, continued its support of statewide protection of groundwater from pesticide contamination. The GWI Subcommittee reviewed and approved the annual groundwater pesticide monitoring plans which include cooperative monitoring between the TCEQ and the Texas Water Development Board (TWDB). Exhibit booths at several conferences provided pesticide-related groundwater information to the public.

Introduction

This report was prepared for the 86th Texas Legislature by the Texas Groundwater Protection Committee (TGPC), as required by Texas Water Code, §26.405. The purpose of this report is to describe TGPC activities conducted in 2017 and 2018 and provide recommendations to improve groundwater protection for consideration by the 86th Legislature. This is the 15th TGPC biennial report provided to the Texas Legislature. A summary of the Texas Groundwater Protection Policy, creation, membership, and duties of the TGPC follows.

Texas Groundwater Protection Policy

The 71st Legislature established the policy of non-degradation of the state's groundwater resources as the goal for all state programs. The state's groundwater protection policy recognizes:

- The variability of the state's aquifers in their potential for beneficial use and susceptibility to contamination;
- The value of protecting and maintaining present and potentially usable groundwater supplies;
- The need for keeping present and potential groundwater supplies reasonably free of contaminants for the protection of the environment and public health and welfare; and,
- The importance of existing and potential uses of groundwater supplies to the economic health of the state.

The state's groundwater protection policy provides discharges of pollutants, disposal of wastes, and other regulated activities be conducted in a manner which will maintain current uses and not impair potential future uses of groundwater or pose a public health hazard. The use of best professional judgment by the responsible state agencies in attaining the goal and policy is also recognized.

TGPC Creation and Membership

The Texas Legislature created the TGPC and established its membership in 1989 and amended the membership in 1993 and 1999. The TGPC includes members from ten state agencies or organizations. State law designates the Texas Commission on Environmental Quality (TCEQ) as the lead agency, with the Executive Director designated as the TGPC's chair. The Executive Administrator of the Texas Water Development Board (TWDB) is designated as the TGPC's vice chair. The other members of the TGPC are:

- Executive Director of the Railroad Commission of Texas (RRC);
- Commissioner of Health of the Texas Department of State Health Services (DSHS);

- Deputy Commissioner of the Texas Department of Agriculture (TDA);
- Executive Director of the Texas State Soil and Water Conservation Board (TSSWCB);
- Representative selected by the Texas Alliance of Groundwater Districts (TAGD);
- Director of Texas A&M AgriLife Research (AgriLife Research);
- Director of the Bureau of Economic Geology (BEG) of The University of Texas at Austin; and,
- Representative of the Water Well Drillers and Pump Installers Program at the Texas Department of Licensing and Regulation (TDLR).

Members serve on the TGPC in addition to their normal agency duties and each agency must provide additional staff as necessary for the TGPC to carry out its responsibilities. All members may designate a representative to the TGPC, but they remain responsible for the representative's acts and decisions. Appendix 1 lists the current TGPC members and their designated representatives. Detailed groundwater protection program descriptions for all of the member agencies and organizations are developed on an annual basis by the TGPC and included in the annual *Joint Groundwater Monitoring and Contamination Report (Joint Report)* available online at www.tceq.texas.gov/publications/sfr/056.

TGPC Statutory Charges

The TGPC implements the state's groundwater protection policy by identifying opportunities to improve existing groundwater quality programs and promoting inter-agency coordination. In addition to its biennial report to the Texas Legislature, the TGPC's major responsibilities are:

- Coordinate groundwater protection activities of the member agencies and organizations;
- Develop and update a comprehensive state groundwater protection strategy to coordinate groundwater protection activities, prevent contamination, and conserve groundwater resources;
- Publish an annual groundwater monitoring and contamination report that describes the current monitoring programs of each member agency and the status of groundwater contamination cases documented or under enforcement during the calendar year;
- Prescribe by rule the reporting form and report contents for the TCEQ to provide a notice of groundwater contamination to the owners of private drinking water wells; and,

- Advise the TCEQ on the development of plans for the protection and enhancement of groundwater quality pursuant to federal statute, regulation, or policy, including management plans for the prevention of water pollution by agricultural chemicals and agents.

Most of the powers and duties of the TGPC outlined in the Texas Water Code have not changed since enacted in 1989. TGPC duties related to the annual groundwater monitoring and contamination report were amended in 1995, and TGPC responsibilities related to notices of groundwater contamination were added in 2003.

TEXAS
GROUNDWATER
PROTECTION
COMMITTEE

ABOUT TGPC MEETINGS SUBCOMMITTEES PUBLICATIONS CONTACT US

62%
IN TEXAS, GROUNDWATER PROVIDES
62% OF ALL FRESHWATER WITHDRAWALS.

TGPC Links

- > Home Page
- > Groundwater Information
- > Pesticides
- > Water Wells
- > Septic Systems
- > Groundwater Contamination
- > Pollution Prevention
- > Water Conservation
- > Classroom Resources
- > Oil, Gas & Mining

Texas Groundwater Protection Committee
The Texas Groundwater Protection Committee (TGPC) strives to identify areas where new or existing groundwater programs could be enhanced, as well as improve coordination among agencies involved in groundwater activities. Its membership is made up of nine state agencies and the Texas Alliance of Groundwater Districts.

TGPC Updates

- > **NEW** [Joint Groundwater Monitoring and Contamination Report - 2017 \(June 2018\)](#)
- > [Activities and Recommendations of the Texas Groundwater Protection Committee - Report to the 85th Legislature \(January 2017\)](#)
- > [Priority Groundwater Management Areas and Groundwater Conservation Districts, Report to the 85th Legislature \(January 2017\)](#)
- > [Landowner's Guide to Plugging Abandoned Water Wells \(Revised March 2010\)](#)
- > [Groundwater Frequently Asked Questions \(FAQs\)](#)

TGPC Member Organizations

- > [Texas Commission on Environmental Quality \(Chair\)](#)
- > [Texas State Soil and Water Conservation Board](#)
- > [Texas Water Development Board \(Vice Chair\)](#)
- > [Texas Alliance of Groundwater Districts](#)
- > [Railroad Commission of Texas](#)
- > [Texas A&M AgriLife Research](#)
- > [Texas Department of State Health Services](#)
- > [University of Texas Bureau of Economic Geology](#)
- > [Texas Department of Agriculture](#)
- > [Texas Department of Licensing & Regulation](#)

How to Get Involved

Attend a Meeting  Learn About Groundwater  Attend a Conference  TGPC Subcommittees 

Texas Groundwater Protection Committee home page, www.tgpc.texas.gov
October 2018.

Recommendations to the 86th Texas Legislature

High-quality groundwater resources are of vital importance to the state's economy and the public health and welfare. As required by Texas Water Code, §26.405, the TGPC submits the following groundwater protection recommendations for legislative consideration. Although the TGPC's recommendations represent the majority opinion of the membership, they do not necessarily reflect the views and policies of each participating organization.

Review of Statute

In preparation of this report, the TGPC reviewed Texas Water Code, Chapter 26, Subchapter J, §§26.401 through 26.408. Based on this review of the statute, the TGPC offers the following observations.

§26.401, Legislative Findings

The state's groundwater protection goal and policy has stood without change since enacted in 1989. The TGPC affirms these findings are still valid and notes an emphasis on groundwater quality protection. The legislative findings are silent on groundwater quantity and groundwater conservation issues; however, a requirement to include guidelines for groundwater conservation in the state's groundwater protection strategy appears in §26.405. This requirement is discussed in the following review of that section. The TGPC believes a statement from the legislature clarifying the committee's intended role in groundwater conservation and quantity management, if any, would be appropriate.

§26.403, Creation and Membership of TGPC

The Texas Legislature created the TGPC in response to environmental protection regulations that became federal law in the 1970s and 1980s. The legislature spread state responsibilities to implement the federal programs among many state agencies. In 1989, the legislature tasked the TGPC with coordinating the state's groundwater protection activities. At its inception, the TGPC was composed of the chief executives of the Texas Water Commission (TCEQ predecessor), TWDB, RRC, TSSWCB, Texas Department of Health (now DSHS), Deputy Commissioner of the TDA, and a representative of the Texas Groundwater Conservation Districts Association (now TAGD). The state agencies are subject to the legislative sunset review process and have undergone multiple reviews since 1989.

In 1993, the Texas Legislature consolidated most of the state's environmental protection activities and programs into the Texas Natural Resources Conservation Commission (TCEQ immediate predecessor). During the same year, the legislature added research organization members from the BEG and AgriLife Research. The

legislature added the TDLR, which includes the Water Well Drillers and Pump Installers Program, in 1999.

The TGPC has determined that once again, additions to committee membership are needed. Legislative findings in §26.401(b) include: “the legislature determines that, consistent with ... the propagation and protection of terrestrial and aquatic life, ... it is the goal of groundwater policy in this state that the existing quality of groundwater not be degraded.”

Because of the Texas Parks and Wildlife Department's responsibilities and expertise for the propagation and protection of terrestrial and aquatic life, the TGPC recommends that the legislature expand committee membership to include this agency.

§26.405, Powers and Duties of TGPC

Most of the powers and duties of the TGPC outlined in the Texas Water Code have not changed since enacted in 1989. In §26.405 (2), there is no timetable for the development and maintenance of the required groundwater protection strategy.

In 2018, the TGPC updated the *Texas Groundwater Protection Strategy (Strategy)*. This new updated *Strategy* is a dynamic document modeled around the topics being discussed in the TGPC Groundwater Issues Subcommittee. This procedural document outlines how groundwater issues are identified and evaluated, as well as the processes by which information is exchanged and recommendations are made to protect the groundwater resources in the state.

This same subsection of the statute includes a provision for the groundwater protection strategy to contain guidelines “for the conservation of groundwater.” This provision is outside of the findings in §26.401, and outside of the realm of groundwater quality protection.

Recognizing the importance of conservation in meeting our future demand, the 80th Regular Session of the Texas Legislature (2007) via the passage of Senate Bill 3 and House Bill 4, created the Water Conservation Advisory Council (WCAC). The legislature created the WCAC to provide the Governor, Lieutenant Governor, Speaker of the House of Representatives, legislature, TWDB, TCEQ, political subdivisions, and the public with the resource of a select council with expertise in water conservation.

As the WCAC's focus extends well beyond groundwater conservation, the TGPC will coordinate with the WCAC on matters related specifically to groundwater conservation. Information will be exchanged between the TGPC and WCAC primarily through common membership, and the TGPC will send a representative to serve in as an observer and an advisor to the WCAC, when necessary.

§26.406, Groundwater Contamination Information and Reports; Rules

When this statute was crafted, the legislature required the TGPC “publish, not later than April 1 of each year, a joint groundwater monitoring and contamination report covering the activities and findings of the committee made during the previous calendar year.” Because of the inter-agency coordination needed to compile the information for this report, and the amount of data manipulation and editing necessary to publish the report, the April 1 deadline has been consistently difficult to achieve. The TGPC has contemplated establishing an electronic database, shared by member agencies, to track groundwater contamination case information; however, no member agency has the resources to develop such a database alone.

The TGPC recommends that the legislature provide support for the creation of an electronic groundwater contamination database, capable of trend and geospatial analysis, to better fulfill the requirements of this section of the statute. If the legislature prefers not to fund such a database, the TGPC respectfully requests the deadline be moved from April 1 to June 1 of each year.

§26.407, Protection and Enhancement Plans

This statute was intended to address the plans for dealing with impacts to groundwater from pesticides (State Management Plan (SMP) or Pesticide Management Plan for Prevention of Pesticide Contamination of Groundwater). The TGPC developed the SMP but the final federal rules for the plan never fully materialized. Although the TGPC and the TCEQ maintain the plans that were developed and continue a monitoring program for pesticides in groundwater, there is no federal or state “driver” behind this mandate.

The TGPC recommends amending the statute as follows:

“Sec. 26.407. PROTECTION AND ENHANCEMENT PLANS. (a) The commission, with the advice of the committee, [shall] may develop plans, except for those plans required by Section 201.026, Agriculture Code, for the protection and enhancement of water quality pursuant to federal statute, regulation, or policy, including management plans for the prevention of water pollution by agricultural chemicals and agents.”

§26.408, Notice of Groundwater Contamination

This statute requires TCEQ to make every effort to provide notice, via first class mail, to each owner of a private drinking water well that may be affected by contamination, once TCEQ receives notice from another agency or independently documents a case of groundwater contamination. The notice must be provided within 30 days of TCEQ’s determination, or receipt of information from another agency. Additionally, notice must also be provided to any applicable Groundwater Conservation District (GCD).

The TGPC recognizes the importance of this statute in protecting Texas citizens; however, more flexibility on the notification process would be helpful to expedite the process and better fulfill the spirit of the law. There is no comprehensive list of private water well owners in the state, and TCEQ staff must go to significant lengths to find mailing addresses for them. In the case of rental properties with private wells, some of which are owned by large out-of-state corporations, notifying the owner may not mean notifying the persons using the water. Other direct means such as a door hang-tag or personal delivery methods are effective ways of notifying private water well owners.

The TGPC recommends that the statute be amended as follows:

“Sec. 26.408. NOTICE OF GROUNDWATER CONTAMINATION. (b) Not later than the 30th day after the date the commission receives notice under Subsection (a) or obtains independent knowledge of groundwater contamination, the commission shall make every effort to give notice of the contamination by first class mail or other direct means to each owner of a private drinking water well that may be affected by the contamination and to each applicable groundwater conservation district.”

Abandoned Water Well Plugging and Education

For over 25 years, the TGPC has recognized abandoned domestic, municipal, industrial, irrigation, and livestock water wells as the most significant threats to Texas groundwater quality. Abandoned wells function as surface contaminant conduits to groundwater. Large-diameter abandoned wells are also hazardous to humans and animals.

Abandoned and deteriorated water wells exist in every county of the state. These wells top the list of potential groundwater contamination sources landowners can find and eliminate. State law requires landowners or persons who possess an abandoned and/or deteriorated water well to repair, plug or cap it under TDLR rules. The TDLR has the authority to assess administrative and civil penalties for non-compliance. However, these rules can be a financial burden and provide no incentive. Educational efforts, such as the TGPC’s *Landowner’s Guide to Plugging Abandoned Water Wells* (TCEQ, 2010) can help land-owners plug their own water



Abandoned, deteriorated, and unplugged water well in an open parking lot near Salado, June 2018.

wells. A state funding source would result in more plugged wells and decrease the threats to groundwater quality.

The TGPC recommends that the legislature provide positive incentives for landowner-initiated closure of abandoned and/or deteriorated water wells through the establishment of an abandoned water well plugging fund.

Fund disbursement could be contingent upon prioritization of potential groundwater quality impacts, hazards, and the landowner's assets. The plugging fund program should be administered by the TDLR, the agency currently responsible for the oversight of water well drillers, well drilling, and well plugging. The TDLR should work cooperatively with local GCDs to disburse monies for the plugging of abandoned and/or deteriorated water wells within the GCD's jurisdiction. Furthermore, the funds could be disbursed on a regional geographic model based on the areas of selection for member appointment to the Water Well Driller Advisory Council. Because of the number of abandoned wells and the ability to "scale" the program, a cost estimate cannot be provided and has not been submitted by any member agency in a Legislative Appropriation Request.

To support the abandoned well plugging program, the TGPC recommends that an outreach program be carried out by Texas A&M AgriLife Extension Service (AgriLife Extension) in coordination with the Texas Water Resources Institute. This program would provide educational publications, websites, and other resources that could be used by county extension agents and other local and regional agencies in the field and workshops to teach the public how to properly plug and manage abandoned water wells.

Support of Agency Programs

The state agency members of TGPC have submitted their appropriation requests to the legislature that would provide the funds necessary to carry out existing groundwater protection programs. State funding may allow an agency to leverage the monies with additional federal funding from the U.S. Geological Survey (USGS), U.S. Environmental Protection Agency, or other federal agencies to implement these activities.

The TGPC recommends support, through legislative appropriations, for programs which enable the TGPC member agencies to protect groundwater quality through technology transfer, educational programming, quantification monitoring, and regulatory protection:

- **Conduct applied research on conjunctive use and its risks and rewards, the implications of aquifer storage and recovery on water quality and evaluation of potential issues, and the characterization of surface water and groundwater interaction.**
- **Assess the technical and economic feasibility of desalination of saline (brackish) groundwater in Texas and better characterize salinity levels of groundwater sources throughout the state.**

- **Provide educational tools, programs, and assistance to Texans through the Texas Well Owner Network (TWON) program.**
- **Provide funding for a regional High Plains Evapotranspiration (ET) Network in support of the Statewide ET network and the statewide meteorological monitoring network (TexMesonet). The spatial and temporal needs of the ET network provide significant value to agriculture, irrigation, forestry, and water resource planners at local to statewide scales.**
- **Provide funding for more research on the conditions (e.g., soils, geology, aquifers, climate, and species) required for water supply enhancement to facilitate increased groundwater quality or quantity.**
- **Provide funding for research on quantification (extent of environmental occurrence), fate and transport, and the environmental and human health effects of emerging contaminants in groundwater.**
- **Provide funding for more research on the relationship between groundwater quality, quantity, and location regarding current endangered species and those proposed to be added to the federal protected list. The intricate link between endangered species and water will pervade water use issues for decades to come.**
- **Address trans-boundary issues, especially with Mexico, and delineate shared aquifers and water supplies before critical limitations on groundwater resources occur.**
- **Evaluate the implications to groundwater regulation and management of redefining “Waters of the United States” as previously proposed by the federal government.**
- **Provide tools to enhance existing data collection, management, and accessibility efforts for groundwater quality data.**
- **Appropriate funds for a statewide groundwater quality public awareness program to supplement existing programs.**
- **Provide funding for public outreach and education on agricultural practices that minimize agricultural water runoff from polluting surface water or groundwater sources.**
- **Provide and support funding for water use education and research by public universities in Texas.**
- **Support continued/enhanced groundwater monitoring and research efforts to identify and better understand groundwater/surface water interactions. Goals of this effort include but are not limited to quantification and prediction of impacts from changing groundwater conditions on riverine subsistence and baseflow as well as spring flows.**
- **Provide funding for the development of a state-wide system to collect and record the location and detailed permit and design information for all On-site Sewage Facilities (OSSFs) at the time of installation or servicing because of the potential of failing systems to negatively affect groundwater quality.**

Activities 2017 and 2018

The TGPC carries out numerous administrative duties required by state law, such as developing this biennial report to the Texas Legislature, holding required quarterly meetings, and ensuring that documents are maintained in a manner that makes them easily accessible to the public. In addition, the TGPC and its subcommittees are subject to the state's open meeting laws.

Periodically, state laws are enacted that require the TGPC to undertake rulemaking. Much of the TGPC's work is performed in quarterly meetings and through the efforts of its subcommittees.



Texas Groundwater Protection Committee Quarterly Meeting in Austin, October 2018.

Groundwater Protection Coordination

The TGPC met quarterly during the biennium, as required by Texas Water Code, §26.404. Regularly scheduled items on the TGPC agenda include subcommittee reports, groundwater-related presentations, roundtable discussions, business items, information exchanges, announcements, and public comment. In addition, agencies share and discuss current and ongoing rule development relating to the protection of groundwater. Meeting presentation topics during 2017 and 2018 included:

- An overview of State Water Planning goals, processes, and costs, as well as a demonstration of the new interactive database (<https://2017.texasstatewaterplan.org/statewide>) for the 2017 State Water Plan (www.twdb.texas.gov/waterplanning/swp/2017/index.asp);
- An overview of the groundwater connection to funding the treatment of urban storm water and how the Clean Water Act Section 319(h) grant program relates to groundwater;
- A demonstration of the new TCEQ Groundwater Contamination Viewer (<http://arcg.is/2nsI9VD>), an interactive, online map of the groundwater contamination cases in Texas that are documented in the annual *Joint Groundwater Monitoring and Contamination Report* ([TCEQ publication SFR-056](#)); and,

- An overview of the goals, tools, problems, status, water sources and pretreatment options, arsenic and metal mobilization mechanisms, cycle testing results, modeling requirements, and hydrogeologic factors of an ideal aquifer storage and recovery (ASR) zone, as well as the regulations and institutional controls for ASR.

The TGPC oversees the GWI, POE, and Legislative Report Subcommittees. Selected Task Forces meet as directed by the TGPC or its subcommittees to address specific issues. The TGPC considers subcommittee findings, recommendations, and materials at its quarterly meetings. During 2017 and 2018, the GWI and POE Subcommittees were the most active.

The TGPC rules define the environmental conditions that constitute groundwater contamination for inclusion of cases in public files of state agencies having groundwater protection responsibilities. The rules describe the contents of the TGPC's *Joint Report* and specify the form and content of notices of groundwater contamination. The TGPC is required to develop and implement a rules review plan for the periodic review and re-adoption of its rules in accordance with Government Code §2001.039. The TGPC adopted its most recent rules review in April 2018. The next quadrennial rules review will be in 2022.

State law requires the TCEQ to be the TGPC's administrative agent, and like other state agencies, the TGPC is subject to the state's open meeting laws. The TCEQ maintains a mailing list of the TGPC members (designated and alternate members), subcommittee members, and agency staff for correspondence. The TCEQ also notifies TGPC members, agency staff, and interested parties of upcoming meetings by e-mail. The TCEQ provides meeting information through the *Texas Register* for public notification, maintains digital recordings of the TGPC meetings, prepares meeting records, and keeps meeting and correspondence files for the TGPC and its subcommittees. In addition, the TGPC publishes documents that are available through the TCEQ's Agency Communications Division. See [Appendix 2](#) for a list of selected TGPC publications. Unlike other state agencies, the TGPC is not subject to sunset review since it does not receive direct state appropriations.

Texas Groundwater Protection Strategy

The Texas Legislature charged the TGPC with developing a comprehensive strategy for the state that includes guidelines for the prevention of groundwater contamination, conservation of groundwater, and provides for the coordination of the groundwater protection activities of all the entities represented on the TGPC. Simply put, the focus of the strategy is documenting what needs to be done to protect groundwater in the State of Texas.

The TGPC first addressed this duty directly in 1988 through the formal publication of the *Texas Ground Water Protection Strategy (Strategy)*. Recognizing the changes that had occurred since the state's first groundwater protection strategy was developed, the TGPC decided in January 2001 to begin the process of updating the *Strategy*. That process resulted in a revised *Strategy* document, TCEQ Publication AS-188 (February 2003). Although this document provided a road map

for the activities of the TGPC, many of its short and medium-term goals had been achieved. This was reported to the Texas Legislature in 2011, 2013, 2015, and 2017.

Strategy Update

During 2017 and 2018, the TGPC developed a proposed *Strategy* update. As required by statute, the TGPC publishes the *Joint Groundwater Monitoring and Contamination Report* (TCEQ publication SFR-056, *Joint Report*) every year. The *Joint Report* explains the status of groundwater protection and monitoring activities that are conducted or required by each member of the TGPC to assure regulatory compliance with groundwater protection, assess ambient groundwater quality, and conduct research activities.

The plan for preserving and conserving groundwater in the state starts with the existing regulatory and non-regulatory groundwater protection, remediation, and conservation programs listed in the *Joint Report*. In addition, this edition of the *Strategy* introduced a summary of how information is exchanged, and recommendations are made within and between the TGPC, its subcommittees, and the public to further protect groundwater resources in the state. The comprehensive strategy for protecting groundwater in Texas includes both the TGPC member's internal programs and the TGPC's internal processes outlined in the updated *Strategy*.

In 2018, the TGPC approved the proposed *Strategy* update for member agency management concurrence, obtained member agency management concurrence, posted an announcement about the proposed *Strategy* update in the *Texas Register* for public comment, obtained and addressed all public comment, and published the updated *Strategy*, TCEQ publication AS-188 (TCEQ, 2018).

Groundwater Classification System

The TGPC and its member agencies recognize that groundwater classification is an important tool in the implementation of the state's groundwater protection policy. Through classification, the groundwater in the state can be categorized and protection or restoration measures can then be specified by member agencies according to the quality and present or potential use of the groundwater.

The TGPC has developed a Groundwater Classification System ([Table 1](#)) for use by state agencies. Four groundwater classes are defined based on quality as determined by total dissolved solids (TDS) content. The TGPC believes that this method of classification remains valid and has made no changes to the system during this biennium.

Table 1. Groundwater Classification System of the Texas Groundwater Protection Committee

CLASS	QUALITY*	EXAMPLES OF USE	AGENCY RESPONSE
Fresh	Zero to 1,000	Drinking and all other uses.	Level I: Protection or restoration measures based on current use as a human drinking water supply.
Slightly Saline	More than 1,000 to 3,000	Drinking if fresh water is unavailable, livestock watering, irrigation, industrial, mineral extraction, oil and gas production.	Level I
Moderately Saline	More than 3,000 to 10,000	Potential/future drinking and limited livestock watering and irrigation if fresh or slightly saline water is unavailable; industrial, mineral extraction, oil and gas production.	Level I
Very Saline to Brine	More than 10,000	Mineral extraction, oil and gas production.	Level II: Protection or restoration measures based on indirect exposure or no human consumption.

*TDS concentration range in milligrams per liter (mg/L).

Groundwater Monitoring Strategy

The need for enhanced groundwater data is obvious – there have been high-profile incidents where the presence of comprehensive groundwater quality data could have avoided unnecessary Federal involvement, litigation, and associated expenses for the state. The TGPC previously identified gaps in groundwater monitoring information, and commissioned development of two versions of a monitoring plan or strategy for the state. Although the plans that were developed provided valuable suggestions for a representative monitoring program for the state, the documents neither individually nor collectively satisfied the TGPC's desire for a comprehensive monitoring program. Additionally, funding for such an undertaking remains an issue.

Public Outreach and Education

The TGPC's POE activities have two overarching themes: (1) the protection of groundwater from contamination, and (2) the protection of human health from contaminated groundwater or groundwater that contains high levels of naturally occurring compounds that could affect human health.

In 2013, the TGPC's POE Subcommittee developed the 2nd Edition of its *Groundwater Educational Outreach Plan* which focused specifically on four areas highlighted in the *Activities and Recommendations of the Texas Groundwater Protection Committee - A Report to the 83rd Legislature*:

- Abandoned Water Wells;
- TSSWCB Water Supply Enhancement Program (formerly known as the Brush Control Program);
- TWON; and,
- Texas ET Networks.

For each topic, this plan identified the most important groundwater-related messages, audiences, and actions that would deliver these messages to these audiences. As of September 2018, the TSSWCB WSEP is no longer being funded, therefore the 3rd Edition of the *Groundwater Educational Outreach Plan* will be updated after the *Activities and Recommendations of the Texas Groundwater Protection Committee - A Report to the 86th Legislature* is approved.

During 2017 and the first half of 2018, the TGPC continued its sponsorship of exhibitor booths and displays at 11 Austin-area conferences, seminars, and meetings with an estimated 4,879 visitors (estimated as ten percent of registered attendees). From its exhibitor booth, the TGPC distributed its trifold brochure, hydrogeological maps, fact sheets, booklets, and links to downloadable groundwater publications at TGPC and other websites. In March of 2017 and 2018, a TGPC-sponsored poster for National Groundwater Awareness Week was displayed in a dozen central Texas locations, including the Texas Capitol.



TGPC exhibit booth at the TCEQ Environmental Trade Fair in Austin, May 2018.



Groundwater samples ready for E. coli analysis at an AgriLife Extension water well screening event.

During 2017 and the first half of 2018, AgriLife Extension conducted several TGPC-supported educational events targeting domestic water well owners, and TGPC-supported drinking water fact sheets were used in conjunction with their water well testing program (842 well samples were screened from 17 counties). In addition, personnel also supported Hurricane Harvey recovery efforts by working with partners to provide water well screenings for more than 1,500 wells through 61 events serving 29 hurricane-impacted counties. As a part of each of these events, participants are encouraged to contact a licensed water well driller and/or the local GCD to decommission water wells that are not in use or deteriorated. An Outreach Events Status Report, listing both recent and upcoming TGPC booth displays, and water well screening events, is updated on the TGPC POE Subcommittee web page before each quarterly meeting.

The TGPC website, <<https://tgpc.texas.gov>>, established in 2002, redesigned in 2013, and upgraded in 2015, is frequently updated with new information on groundwater protection activities. In addition to providing information about TGPC business to its members and the public, the website is a clearinghouse for many groundwater-related topics, supplying links to the websites and publications of TGPC members and other organizations. Three existing frequently asked questions (FAQs) were updated and one new FAQ was added to the TGPC website during the last two years. These 42 FAQs are one-to two-page summaries of topics related to groundwater quantity, groundwater quality (e.g., pesticides, radionuclides, uranium mining, and oil and gas activities). The FAQs also discuss septic systems, water wells, administrative entities (e.g., GCDs, Regional Water Planning Groups, Municipal Settings Designations), and publications. These popular press articles assist state-wide newsletter editors and webmasters in disseminating groundwater-related information to the public.

An email subscription service with an average of 5,990 recipients is used to notify the public of upcoming meetings and new TGPC website information. TGPC website activity in 2017 and the first half of 2018 averaged 17 new and returning visitors per day, two Web pages viewed per visit, and two minutes spent on the website per visit.

Joint Groundwater Monitoring and Contamination Reports

The TGPC is required by Texas Water Code, §26.406 to publish an annual groundwater monitoring and contamination report. This report:

- Describes the status of groundwater monitoring activities conducted or required by each agency at regulated facilities or associated with regulated activities;
- Identifies each case of groundwater contamination newly documented during the previous calendar year;
- Lists the cases of contamination documented during previous calendar years for which enforcement action was incomplete when the preceding report was issued; and,
- Indicates the status of enforcement action for each listed case of contamination.

The TGPC produced and published two monitoring and contamination reports during the previous two years: *Joint Groundwater Monitoring and Contamination Report—2016* (TGPC, 2017) and *Joint Groundwater Monitoring and Contamination Report—2017* (TGPC, 2018).

Each TGPC member agency or organization provides data for the *Joint Report* and a description of its programs that protect groundwater. Each regulatory program with enforcement authority provides a brief description of each case of groundwater contamination as well as the enforcement status for the case. Groundwater contamination cases are listed in the report by regulatory agency, then sorted by county and the specific regulatory program with jurisdiction over the case.

Groundwater Monitoring

The groundwater monitoring programs of the TGPC member agencies fall within one of three categories:

- Regulatory agencies that require or conduct monitoring to assure compliance with guidelines and regulations for the protection of groundwater from discharges of contaminants;
- Agencies or entities that conduct monitoring to assess ambient or existing groundwater quality conditions and to track changes in water quality over time; or,
- Agencies or entities that conduct research activities related to groundwater resources and groundwater conservation.

Each regulatory agency that requires or conducts groundwater monitoring to assure compliance with guidelines and regulations to protect groundwater from discharges of contaminants has its own monitoring program requirements and procedures. The criteria used to assess the need for groundwater monitoring varies among the regulatory entities. Currently, there are 23 regulatory monitoring programs within two state agencies described in the report: 21 within the TCEQ and two at the RRC. Fifteen of these programs required some form of groundwater monitoring in 2017.

Monitoring of groundwater quality for permit and operational requirements occurred at about 9,200 facilities statewide in 2017. Of those facilities, 90 percent

are in the TCEQ's Public Drinking Water program (60 percent) and TCEQ's Remediation programs (28 percent).

About 50,000 monitor wells were used in 2016, and about 48,000 were used in 2017 at 13,000 regulated facilities. Most of the monitored facilities (about 94 percent in 2017) are under the jurisdiction of the TCEQ, with the remainder under the jurisdiction of the RRC (six percent).

The TWDB, GCDs, and USGS conduct non-regulatory groundwater monitoring to assess ambient groundwater quality conditions and to track changes over time. Some water quality monitoring programs target specific geographic areas, contaminants, constituents, or activities. Contamination cases discovered by these agencies or entities through groundwater studies or groundwater sampling programs are referred to the regulatory agency with the appropriate jurisdiction.

The TWDB and participating organizations reported sampling 344 water wells and monitoring sites (including springs) in 2016 and 418 in 2017. The TWDB's collection of these samples and analyses of additional samples from cooperative entities comprise the state's ambient groundwater quality sampling program. The TWDB enters groundwater quality data collected under this program in its groundwater database.

Groundwater Contamination

The TGPC defines "groundwater contamination" for inclusion in the *Joint Report* (Title 31 Texas Administrative Code, Chapter 601). Contamination means the detrimental alteration of the naturally occurring physical, thermal, chemical, or biological quality of groundwater reasonably suspected of having been caused by the activities of entities under the jurisdiction of the state agencies. The TGPC recognizes that groundwater contamination may result from many sources, including: agricultural activities; commercial and business endeavors; current and past oil and gas exploration and production and related practices; domestic activities; industrial and manufacturing processes; and, natural sources that may be influenced by, or may be the result of, human activities.

The contamination cases identified in the *Joint Report* are primarily those where contaminants have been discharged to the surface, to the shallow subsurface, or directly to groundwater from activities such as the storage, processing, transport, or disposal of products or waste materials. The most common contaminants reported in both 2016 and 2017 were gasoline, diesel fuel, and other petroleum products due to the large number of cases related to petroleum storage tank systems. Less commonly reported contaminants were organic compounds (such as phenol, trichloroethylene, carbon tetrachloride, dichloroethylene, and naphthalene), pesticides (such as alachlor, atrazine, bromacil, dicamba, and prometon), creosote constituents, solvents, heavy metals, and sodium chloride.

There were 3,444 documented groundwater contamination cases in the *Joint Report* for 2016 and 3,426 cases in 2017. About 83.5% of the documented cases in 2017

were under TCEQ jurisdiction. The rest of the cases were under RRC jurisdiction (about 16.5%) and GCDs which are members of TAGD (less than 0.1%).

Table 2 lists the documented groundwater contamination cases reported by each agency with enforcement jurisdiction and is further broken down by program within the agency. Table 2 also illustrates the total percentage of documented cases attributable to each agency and program and the net change and percentage change from 2016 to 2017.

Table 2. Groundwater Contamination Cases by Jurisdictional Agency, 2016-2017

Agency / Division / Program	2016 Number of Cases	2017 Number of Cases	% of total (2016)	% of total (2017)	Net Change (# of cases)	Percentage change
TCEQ - Radioactive Materials Division						
Radioactive Materials Licensing	1	1	0.03%	0.03%	0	0.0%
Uranium & Technical Assessments	3	3	0.09%	0.09%	0	0.0%
TCEQ - Remediation Division						
Brownfield Site Assessment	0	0	0%	0%	0	n/a
Corrective Action	536	628	15.6%	18.3%	92	17.2%
Dry Cleaner Remediation	210	219	6.1%	6.4%	9	4.3%
Innocent Owner/Operator	227	104	6.6%	3.0%	-123	-54.2%
Preliminary Assessment/Site Assessment	0	6	0.0%	0.2%	6	n/a
Petroleum Storage Tank	1,170	1,173	34.0%	34.2%	3	0.3%
Superfund Cleanup	84	81	2.4%	2.4%	-3	-3.6%
Superfund Site Discovery & Assessment	9	4	0.3%	0.1%	-5	-55.6%
Voluntary Cleanup	541	557	15.7%	16.3%	16	3.0%
TCEQ - Waste Permits Division						
Municipal Solid Waste	55	55	1.6%	1.6%	0	0%
Industrial and Hazardous Waste	3	2	0.1%	0.1%	-1	-33.3%
TCEQ - Water Quality Division						
Water Quality Assessment	15	15	0.4%	0.4%	0	0.0%
TCEQ - Water Supply Division						
Public Drinking Water	4	0	0.1%	0%	-4	-100%
TCEQ - Water Availability Division						
Groundwater Planning & Assessment	5	5	0.1%	0.1%	0	0%
TCEQ - Enforcement Division						
	3	7	0.1%	0.2%	4	133.3%
TCEQ - Subtotal:	2,866	2,860	83.2%	83.5%	-6	-0.2%
Railroad Commission of Texas - Oil and Gas Division	577	565	16.8%	16.5%	-12	-2.1%
Texas Alliance of Groundwater Districts	1	1	0.03%	0.03%	0	0%
TOTAL:	3,444	3,426				

The *Joint Reports* for both 2016 and 2017 document the number of groundwater contamination cases attributed to leaking petroleum storage tanks (LPSTs). As reported by the TCEQ, the number of documented groundwater contamination cases resulting from the failure of petroleum storage tank systems remained steady in 2016 (1,170 cases) and 2017 (1,173 cases). These numbers are consistent with the number of LPST cases in the previous two-year period, 2014 (1,176 cases) and 2015 (1,150 cases).

Whereas the number of documented contamination cases from LPSTs is high compared to other programs, it can be directly linked to the number of regulated facilities. In 2018, there were about 75,000 facilities that either have or had previously registered PSTs. Although contamination from LPSTs remains the largest category in the *Joint Report*, the number of cases (1,173 cases in 2017) has declined about 82 per cent from the 6,504 contamination cases attributed to LPSTs listed in the 1999 *Joint Report*.

This declining trend does not necessarily indicate that a smaller percentage of regulated petroleum storage tanks are leaking. The declining trend does, however, show the effectiveness of new regulations implemented during the 1990s that helped catch leaks and address them before affecting groundwater.

Table 2 also illustrates an increase in the number of active cases reported by the RRC. The RRC case count declined by two percent between 2016 and 2017. Active RRC cases are under the jurisdiction of the Oil and Gas Division's Operator Cleanup Program.

The TCEQ programs with an increase in the number of active cases from 2016 to 2017 are: Corrective Action (92 cases), Dry Cleaner Remediation (nine cases), PST (three cases), Voluntary Cleanup (16 cases), Preliminary Assessment / Site Assessment (six cases), and Enforcement (four cases).

The *Joint Report* also shows the status of enforcement action for each instance of groundwater contamination. For purposes of the *Joint Report*, enforcement action includes any agency action that carries out or needs identification, documentation, monitoring, assessing, or remediation of groundwater contamination. In general, regulatory programs are structured to achieve the desired degree of environmental protection and mitigation with the lowest possible level of agency oversight; and, although the status of a contamination case may remain at an agency action level for a long period, physical activities related to the assessment and remediation may change often. The comparison of the level of agency action and the status or level of contamination assessment and mitigation allows a one-to-one correlation between an agency's response (enforcement status) and the completion of the discrete phases in the progression of contamination investigation (activity status).

Once groundwater contamination has been confirmed, either the regulated entity or the agency will address the groundwater contamination incident following a general sequence of actions until the investigation concludes that no further action is necessary. All the 3,426 cases listed in the 2017 report have documented groundwater contamination. The activity status for these cases can be summarized as follows:

- No activity has occurred in 258 reported cases;
- Contamination is confirmed (validated) in 288 cases;
- Investigations are ongoing for the largest number of cases: 1,147;
- Corrective action planning is complete in 216 cases;

- Action was implemented in 454 cases;
- Monitoring action is ongoing in 615 cases;
- No further action is necessary for 456 cases designated as "action completed."; and,
- For 13 cases, no activity status information was provided.

Historically, the number of new groundwater contamination cases documented each year has been greater than the number of cases in which action was completed. This was evident in the first publication of the report in 1989 and continued through the 1999 calendar year. Starting in 2000, the trend reversed, and since 2012 the number of new cases and completed cases has been similar.

The *2017 Joint Report* includes a summary of the changes since 1998. In the past 20 years, the average number of new cases each year is approximately 481, which is significantly lower than the average number of new cases each year before 2000. While the number of new cases increased from 2016 to 2017, this increase of approximately 16% is generally consistent with the variance over the past 20 years, and the average number of new cases in the last two years (2016 and 2017) is consistent with the 20-year average. The number of completed cases has also varied over the years, but it has remained relatively steady since 2000 and through 2017.

Notification of Groundwater Contamination

Texas Water Code, §26.408 requires the TCEQ to inform owners of private drinking water wells, within 30 days of the date the TCEQ receives notice of groundwater contamination, that their well may be affected by contamination. GCDs in which the contamination is occurring are also notified. In November 2003, and in accordance with the statute, the TGPC developed by rule the report form and reporting content of the TCEQ notice. During fiscal years 2016 and 2017, 420 notices were mailed for 63 cases of groundwater contamination that might affect private drinking water wells.

Prevention of Pollution from Agricultural Chemicals

Texas Water Code, §26.407 requires the TCEQ to develop any necessary management plans for agricultural chemicals, with the advice of the TGPC. The TCEQ with participation from the TGPC, in 2001, developed the Texas State Management Plan for Prevention of Pesticide Contamination of Groundwater <https://www.tceq.texas.gov/assets/public/comm_exec/pubs/sfr/070_01.pdf>. This plan, as a generic Pesticide Management Plan (PMP) for the state, serves as a guide for the prevention of pesticide contamination of groundwater. The plan was developed as a joint effort of the agency members of the former TGPC Agricultural Chemicals Subcommittee, now a Task Force within the GWI Subcommittee. Agricultural Chemicals Task Force (ACTF) status reports are provided at the quarterly subcommittee meetings.

The PMP explains the general policies and regulatory and non-regulatory approaches the state will use to protect groundwater resources from pesticide contamination. The plan describes how the responsible agencies will coordinate while executing the PMP. It also provides specific responses and actions needed to protect groundwater.

The PMP reflects the state's philosophy toward groundwater protection and recognizes the importance of agriculture to the state's economy. Much of the TGPC's work on agricultural chemicals follows the PMP and is performed by the ACTF within the GWI Subcommittee.

Currently, the ACTF focus remains on three areas of the PMP: (1) continued cooperative monitoring; (2) responding to confirmed cases of pesticide contamination of groundwater; and, (3) identifying and providing outreach on Best Management Practices in problem areas. Monitoring efforts have been enhanced through TCEQ and TWDB cooperative sampling.



Denise Benitez (TCEQ Mickey Leland Intern) assists screening groundwater samples for pesticides at the TCEQ laboratory in Austin, June 2018.

The 2017 cooperative effort succeeded in collecting a total of 74 well samples and 28 Quality Assurance (QA) samples for atrazine analyses. There were no quantifiable atrazine detections in the 102 immunoassay analyses performed by the TCEQ. These results are consistent with the historical trend of no detections with an occasional low-level detection of atrazine.

The 2018 cooperative monitoring is in progress and the results will be in the next report. The TCEQ collected 15 well and spring samples in an area from Williamson to Ellis counties along and east of IH-35, mostly in the corn and sorghum croplands. No quantifiable detections of pesticides were found.

Results of the pesticide sampling of groundwater by the USGS for 2016 and 2017 were entered into the Interagency Pesticide Database in 2017 and early 2018. Also, the TCEQ updated the online Pesticides of Interest Tracking System (POINTS) through 2017.

The TGPC sponsored educational outreach activities at the annual Texas Plant Protection Conference in December 2017 and the TCEQ Environmental Trade Fair in May 2018. During these conferences, the PMP program was explained through the distribution of brochures and the display of various pesticide monitoring graphics, including maps of water wells monitored for pesticides in Texas.

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Appendixes

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Appendix 1. Texas Groundwater Protection Committee Membership

Chair—Texas Commission on Environmental Quality	
<p>Toby Baker, Executive Director MC-109 Texas Commission on Environmental Quality P.O. Box 13087 Austin TX 78711-3087 Phone: (512) 239-3900; Fax: (512) 239-3939</p>	<p><i>Designated Chair:</i> Cary L. Betz, P.G., Manager Permit Support, Compliance and Groundwater Section Water Availability Division, Office of Water MC-160 Texas Commission on Environmental Quality P.O. Box 13087 Austin TX 78711-3087 Phone: (512) 239-4506; Fax: (512) 239-2214 E-mail: cary.betz@tceq.texas.gov</p>
Vice-Chair—Texas Water Development Board	
<p>Jeff Walker, Executive Administrator Texas Water Development Board P.O. Box 13231 Austin TX 78711-3231 Phone: (512) 463-7847; Fax: (512) 475-2053</p>	<p><i>Designated Vice-Chair:</i> Larry French, PG, Director Groundwater Division Texas Water Development Board P.O. Box 13231; Austin TX 78711-3231 Phone: (512) 463-5067; Fax: (512) 936-0816 E-mail: larry.french@twdb.texas.gov</p>
Railroad Commission of Texas	
<p>Wei Wang, Executive Director Railroad Commission of Texas P.O. Box 12967 Austin TX 78711-2967 Phone: (512) 463-7158; (877) 228-5740 Fax: (512) 463-7161</p>	<p><i>Designated Representative:</i> Ashley Correll, PG Voluntary Cleanup Program Railroad Commission of Texas P.O. Box 12967 Austin TX 78711-2967 Phone: (512) 463-3384; Fax: (512) 463-2388 E-mail: ashley.correll@rrc.texas.gov</p>
Texas State Soil and Water Conservation Board	
<p>Rex Isom, Executive Director Texas State Soil and Water Conservation Board 1497 Country View Lane Temple TX 76504 Phone: (254) 773-2250; (800) 792-3485 Fax: (254) 773-3311</p>	<p><i>Designated Representative:</i> T.J. Helton, Coordinator Nonpoint Source Program Texas State Soil and Water Conservation Board 1497 Country View Lane Temple TX 76504 Phone: (254) 773-2250, ext. 234; Fax: (254) 773-3311 E-mail: thelton@tsswcb.texas.gov</p>
Texas Department of Agriculture	
<p>Jason Fearneyhough, Deputy Commissioner Texas Department of Agriculture P.O. Box 12847 Austin TX 78711-2847 Phone: (512) 463-1408; Fax: (888) 223-8861</p>	<p><i>Designated Representative:</i> David Villarreal, PhD Environmental Specialist Texas Department of Agriculture P.O. Box 12847 Austin TX 78711-2847 Phone: (512) 463-7481; Fax: (888) 216-9834 E-mail: david.villarreal@texasagriculture.gov</p>

Texas Department of State Health Services	
<p>John William Hellerstedt, M.D., Commissioner Texas Department of State Health Services P.O. Box 149347 Austin TX 78714-9347 Phone: (512) 776-7363; Fax: (512) 776-7477</p>	<p><i>Designated Representative:</i> Emily Hall, MPH, Manager Environmental Surveillance and Toxicology Branch Texas Department of State Health Services PO Box 149347, MC-1964 Austin TX 78714-9347 Phone: (512) 776-2652; Fax: (512) 776-7222 E-mail: emily.hall@dshs.texas.gov</p>
Texas Department of Licensing and Regulation	
<p>David Gunn Texas Department of Licensing and Regulation Well Driller/Pump Installer/Abandoned Well Referral Program PO Box 12157 Austin TX 78711 Phone: (512) 334-5539; Fax: (512) 463-8616 E-mail: david.gunn@tdlr.texas.gov</p>	<p><i>Designated Representative:</i> Same</p>
Texas Alliance of Groundwater Districts	
<p>Dirk Aaron President, Texas Alliance of Groundwater Districts General Manager, Clearwater Underground Water Conservation District P.O. Box 1989 Belton, TX 76513 Phone: (254) 933-0120; Fax: (254) 933-8396</p>	<p><i>Designated Representative:</i> David A. Van Dresar General Manager, Fayette County GCD 255 Svoboda Lane, Room 115 La Grange, TX 78945 Phone: (979) 968-3135; Fax: (979) 968-3194 E-mail: david@fayettecountygroundwater.com</p>
Texas A&M AgriLife Research	
<p>Patrick J. Stover, Ph.D., Director Texas A&M AgriLife Research Mail Stop: 2142 TAMU College Station TX 77843 Phone: (979) 845-8486; Fax: (979) 458-4765</p>	<p><i>Designated Representative</i> John C. Tracy, Ph.D., Director Texas Water Resources Institute 2118 TAMU College Station TX 77843-2118 Phone: (979) 862-7221; Fax: 979-845-8554 E-mail: john.tracy@aq.tamu.edu</p>
Bureau of Economic Geology of The University of Texas at Austin	
<p>Scott Tinker, Ph.D., Director Bureau of Economic Geology The University of Texas at Austin University Station, Box X Austin TX 78713-8924 Phone: (512) 471-0209; Fax: (512) 471-0140</p>	<p><i>Designated Representative</i> Bridget R. Scanlon, Ph.D., Senior Research Scientist Bureau of Economic Geology The University of Texas at Austin University Station, Box X Austin TX 78713-8924 Phone: (512) 471-8241; Fax: (512) 471-0140 E-mail: bridget.scanlon@beg.utexas.edu</p>

Appendix 2. Selected Publications of the TGPC

Texas Groundwater Protection Strategy. TCEQ publication AS-188 (November 2018).

<www.tceq.texas.gov/assets/public/comm_exec/pubs/as/188.pdf>

Joint Groundwater Monitoring and Contamination Report - 2017. TCEQ publication SFR-056/17 (June 2018); and *Joint Groundwater Monitoring and Contamination Report - 2016*. TCEQ publication SFR-056/16 (July 2017):

<<https://www.tceq.texas.gov/publications/sfr/056>>

Texas State Management Plan for Prevention of Pesticide Contamination of Groundwater. TCEQ publication SFR-070 (January 2001):

<www.tceq.texas.gov/assets/public/comm_exec/pubs/sfr/070_01.pdf>

Texas Ground-Water Data Dictionary. TNRCC publication GI-272 (August 1996). <<https://www.tgpc.texas.gov/groundcommittees/gi-272.pdf>>

Landowner's Guide to Plugging Abandoned Water Wells. TCEQ publication RG-347 (March 2010). Available from the TGPC web site:

<<https://tgpc.texas.gov/tgpc-publications/#Current>> Or TCEQ Publications:

<<https://www.tceq.texas.gov/publications>>

Drinking Water Problems Fact Sheets

Arsenic. AgriLife Extension publication (English) EL-5467 (electronic download) (December 2005) and (Spanish) EL-5467S (electronic download) (June 2006).

Perchlorate. Texas AgriLife Extension Service publication (English) EL-5468 (November 2005) and (Spanish) EL-5468S (February 2006).

Nitrates. AgriLife Extension publication (English) EB-6184 (May 2006) and (Spanish) EB-6184S (May 2006).

Radionuclides. AgriLife Extension publication (English) EB-6192 (July 2006) and (Spanish) EB-6192S (November 2006).

MTBE. AgriLife Extension publication (English) L-5502 / EL-5502 (June 2008).

Benzene. AgriLife Extension publication (English) L-5513 / EL-5513 (April 2009).

Note: These publications can be accessed at <www.agrilifebookstore.org>.

On-site Wastewater Treatment Systems Fact Sheets

Homeowner's Guide to Evaluating Service Contracts. AgriLife Extension publication (in English) B-6171 (paper copy) / EB-6171 (electronic download) (July 2005).

Graywater. AgriLife Extension publication (English) EB-6176 (electronic download) (October 2005).

Understanding and Maintaining Your Septic System. AgriLife Extension publication (English) L-5491 / EL-5491 (March 2008).

Note: These publications can be accessed at <www.agrilifebookstore.org>.

Water Wells Fact Sheets

Capping of Water Wells for Future Use. AgriLife Extension publication (English) EL-5490 (electronic download) (August 2007).

Plugging Abandoned Water Wells. AgriLife Extension publication (English) B-6238 / EB-6238 (April 2010).

Note: These publications can be accessed at <www.agrilifebookstore.org>

Pesticides Best Management Practices Trifold Brochure

Keep Pesticides Out of Texas Water Supplies - Best Management Practices to Prevent Pesticide Contamination. AgriLife Extension publication (English) L-5500 / EL - 5500 (July 2008).

Note: This publication can be accessed at <www.agrilifebookstore.org>.



TCEQ geologist Scott Underwood collects a groundwater sample for pesticide analysis from a spring near Weir, June 2018.

National Groundwater Awareness Week

MARCH 10-16, 2019

Groundwater is a precious resource in Texas that needs to be protected and preserved

- Ninety percent of Texans depend on public drinking water supplies. Twenty percent of that supply—1,210 million gallons per day—is from groundwater, serving over 5,398,269 Texans.
- There are 14,051 active public water supply wells in Texas ranging in depth from 18 to 5,407 feet.
- Nine major aquifers and 21 minor aquifers supply 62% of all the water used in the state.
- Also, 2,230,000 Texans rely on groundwater from their own wells for their drinking water and use 257 million gallons per day.
- The quality of Texas' groundwater is generally good, and after the required disinfection, meets the U.S. Environmental Protection Agency's safe drinking water standards without additional treatment.

NATIONWIDE, GROUNDWATER PROVIDES AN ESTIMATED:

- 25% of all freshwater withdrawals
- 43% of agricultural use (mostly for irrigation)
- 37% of the public water supply withdrawals
- 98% of drinking water for the rural population

IN TEXAS, GROUNDWATER PROVIDES AN ESTIMATED:

- 62% of all freshwater withdrawals
- 75% of agricultural use (mostly for irrigation)
- 28% of the public water supply withdrawals
- >99% of drinking water for the rural population

From the United States Geological Survey, the National Groundwater Association, the Texas Water Development Board, and the Texas Commission on Environmental Quality



FOR MORE INFORMATION ON GROUNDWATER ISSUES IN TEXAS, visit the Texas Groundwater Protection Committee's website at www.tgpc.texas.gov