

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

Report to the 83rd Legislature



MEMBER AGENCIES

Texas Commission on Environmental Quality
Texas Water Development Board
Railroad Commission of 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
University of Texas Bureau of Economic Geology
Texas Department of Licensing and Regulation



State Capitol Building. State file photo.

Activities and Recommendations of the Texas Groundwater Protection Committee: A Report to the 83rd Legislature

Prepared by
Texas Groundwater Protection Committee

SFR-047/12
January 2013



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Abbreviations Used

ACS	Agricultural Chemicals Subcommittee
BEG	Bureau of Economic Geology
BMP	Best Management Practices
DSHS	Department of State Health Services
EPA	United States Environmental Protection Agency
FAQ	Frequently Asked Question
GCD	Groundwater Conservation District
Joint Report	Joint Groundwater Monitoring and Contamination Report
MCL	Maximum Contaminant Level
PMP	Pesticide Management Plan
POE	Public Outreach and Education (Subcommittee)
RCT	Railroad Commission of Texas
Strategy	Texas Groundwater Protection Strategy—2003
TAGD	Texas Alliance of Groundwater Districts
TAMAES	Texas A&M AgriLife Extension Service
TAMAR	Texas A&M AgriLife Research
TCEQ	Texas Commission on Environmental Quality
TDA	Texas Department of Agriculture
TDLR	Texas Department of Licensing and Regulation
TDS	Total Dissolved Solids
TGPC	Texas Groundwater Protection Committee
TSSWCB	Texas State Soil and Water Conservation Board
TWC	Texas Water Code
TWDB	Texas Water Development Board
USGS	U.S. Geological Survey
WCAC	Water Conservation Advisory Council
WWD/PI/ABW	Water Well Driller/Pump Installer/Abandoned Well

Executive Summary

This report describes Texas Groundwater Protection Committee (TGPC or Committee) activities during 2011 and 2012, discusses select groundwater protection issues, and provides recommendations to improve groundwater protection for the 83rd Texas Legislature's consideration. The report was prepared by the Texas Commission on Environmental Quality (TCEQ) for the TGPC. The report fulfills the requirements of Texas Water Code, §26.405.

The TGPC has reviewed its statutory guidance and recommends the Legislature may need to reconsider the TGPC's membership and review its present powers and duties. The recommendations include:

- Adding one state agency member;
- Removing the responsibility of formal membership of one state agency;
- Adding a timetable for revising the state's Groundwater Protection Strategy;
- Removing or clarifying conservation responsibilities of the Committee;
- Supporting the development of an electronic groundwater contamination case database;
- Amending language concerning groundwater management plans.

The TGPC continues to advocate for enhanced groundwater protection through abandoned well plugging and educational outreach. The state agency members of TGPC recommend favorable consideration of their appropriation requests that would provide funds necessary to carry out existing groundwater protection programs.

The Public Outreach and Education (POE) Subcommittee has developed a total of 39 Frequently Asked Questions (FAQs). These FAQs are posted on the TGPC website (www.tgpc.state.tx.us), and are our most cost effective means of outreach. The POE Subcommittee has also continued support of statewide water well screening events, and has provided groundwater information to the public through exhibit booths at over a dozen conferences statewide. An online survey of a select group of cooperators was conducted during the last biennium to guide the update of the POE Subcommittee's Groundwater Educational Outreach Plan.

The Texas Groundwater Protection Strategy remains under review. Several member agencies underwent "Sunset" review during the 82nd Legislature, which delayed review of the strategy. No changes to the strategy have been adopted by the TGPC during this biennium.

As required by Texas Water Code, §26.406, the TGPC produced and published two annual Joint Groundwater Monitoring and Contamination Reports during the previous two years (TGPC, 2011 and TGPC, 2012). Monitoring of groundwater quality for regulatory requirements occurred at approximately 10,619 facilities statewide in 2011, using approximately 36,800 monitor wells. There were 4,268 documented groundwater contamination cases in the report for 2010 and 3,923 cases in 2011. The most common contaminants in these reports were attributed to leaking petroleum storage tanks. For 2011, 89% of the cases were under the jurisdiction of the TCEQ and 11% were under the jurisdiction of the Railroad Commission of Texas (RCT).

During fiscal years 2011 and 2012, 830 notices were mailed by the TCEQ for 60 cases of groundwater contamination that might affect private drinking water wells. The notices used the form adopted by the TGPC in 2003.

The Agricultural Chemicals Subcommittee (ACS) continued its support of statewide protection of groundwater from pesticide contamination. Annual groundwater pesticide monitoring plans that include cooperative monitoring with the Texas Water Development Board (TWDB) and certain TCEQ program areas were reviewed and approved by the subcommittee. Exhibit booths at several conferences provided groundwater information to the public.



Texas Groundwater Protection Committee

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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.

[Joint Groundwater Monitoring and Contamination Report - 2010](#)

[Activities and Recommendations of the Texas Groundwater Protection Committee - Report to the 82nd Legislature](#)

[Priority Groundwater Management Areas and Groundwater Conservation Districts, Report to the 82nd Legislature](#)

[Landowner's Guide to Plugging Abandoned Water Wells \(Revised March 2010\)](#)

[Carrizo-Wilcox Aquifer Study Website](#)

[Groundwater Frequently Asked Questions \(FAQs\)](#)

TGPC Member Organizations

Click on member organizations for information on their role in the TGPC.

More than half the water used in Texas comes from groundwater

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

TGPC Subcommittees

The TGPC works on special issues through subcommittees composed of agency personnel and the general public. The subcommittees are:

- [Agricultural Chemicals Subcommittee](#)
- [Data Management Subcommittee](#)
- [Groundwater Research Subcommittee](#)

Introduction

This report was prepared for the 83rd 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 2011 and 2012 and provide recommendations to improve groundwater protection for the 83rd Texas Legislature to consider. A summary of the Texas Groundwater Protection Policy and the creation, membership and duties of the TGPC follows. This is the twelfth TGPC biennial report provided to the Texas Legislature.

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 that discharges of pollutants, disposal of wastes, and other regulated activities be conducted in a manner that 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 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 chairman. The Executive Administrator of the Texas Water Development Board (TWDB) is designated as the TGPC's vice chairman. The other members of the TGPC are: Executive Director of the Railroad Commission of Texas (RCT); Commissioner of Health of the 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 (TAMAR); Director of the Bureau of Economic Geology (BEG) of the University of Texas at Austin; and Representative of the Water Well Drillers and Water Well Pump Installers program at the Texas Department of Licensing and Regulation (TDLR).

Each member serves as an additional duty of office and each agency is required to provide staff as necessary for TGPC to carry out its responsibilities. All members may designate a representative to the TGPC, but remain responsible for the acts and decisions of the representative. The current TGPC members and their designated representatives are listed in Appendix 1. 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 available online at: <http://tgpc.state.tx.us>.

TGPC Statutory Charges

The TGPC implements the state's groundwater protection policy by identifying opportunities to improve existing groundwater quality programs and promote coordination among agencies. The TGPC identifies areas where new or existing programs can be enhanced to provide additional protection. In addition to its biennial report to the legislature, the major responsibilities of the TGPC are to:

- 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 TCEQ to provide 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 remained unchanged 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.

Recommendations to the 83rd 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.

While the TGPC's recommendations represent the majority opinion of the membership, they do not necessarily reflect the views and policies of each participating organization. The recommendations are not listed in priority order.

Review of Statute

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

§26.401, Legislative Findings

The groundwater protection goal and policy of the state has stood without change since enacted in 1989. The TGPC affirms these findings remain as valid now as they did in 1989, 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 that 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 TGPC was created largely in response to myriad of federal regulations for environmental protection that were originally passed in the 1970s and 1980s. State responsibilities to implement the federal programs were spread among numerous state agencies, and the Texas Legislature responded in 1989 by creating the TGPC to coordinate the state's groundwater protection activities. At its inception, the TGPC was composed of the chief executives of the Texas Water Commission (predecessor to the TCEQ), TWDB, RCT, Texas Department of Health (now DSHS), and TSSWCB, as well as the Deputy Commissioner of TDA, and a representative selected by the Texas Groundwater Conservation Districts Association (now TAGD). All of these agencies except the latter 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 – the predecessor of the TCEQ. TGPC was expanded by the Legislature to include research organization members from BEG and TAMAR in 1993, and TDLR was added in 1999 after the Water Well Drillers and Pump Installers Program was transferred to that agency.

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.**

Similarly, the roles of various member agencies have evolved since the creation of the TGPC in 1989. The Texas Department of Health (now the Department of State Health Services) was named as one of the original members of the TGPC as the agency overseeing Public Drinking Water, Municipal Solid Waste, and Radiation Control programs. These programs are among those consolidated into the Texas Natural Resource Conservation Commission and subsequently the TCEQ, leaving the DSHS with only auxiliary groundwater responsibilities. **While the DSHS will continue to be asked to provide valuable health related information to the TGPC, the Committee recommends that the Legislature remove the DSHS from the responsibility of formal membership in the Committee.**

§26.405, Powers and Duties of TGPC

As noted previously, most of the powers and duties of the TGPC outlined in the Texas Water Code have remained unchanged since enacted in 1989. In §26.405 (2), there is no timetable for the development and maintenance of the required groundwater protection strategy.

In the most recent version of the Texas Groundwater Protection Strategy, the TGPC listed as a goal the review of the strategy every six years. On this timetable, the first review of the strategy coincided with a legislative session and the lead up to “sunset” review of several key committee member agencies. As a result, this goal of the strategy was not met.

The TGPC recommends that the legislature include in the statute a timetable for the strategy as it does for the State Water Plan. The TGPC further recommends a five year schedule for the review and possible revision of the groundwater protection strategy.

This same subsection of the statute includes a provision for the strategy to contain guidelines “for the conservation of groundwater.” This provision is outside of the findings set forth 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 WCAC was created to provide the Governor, Lieutenant Governor, Speaker of the House of Representatives, Legislature, Texas Water Development Board, Texas Commission on Environmental Quality, political subdivisions, and the public with the resource of a select council with expertise in water conservation.

The TGPC recommends that the provision for the strategy to include conservation guidelines be removed from the statute, in deference to the activities of the more recently created WCAC. If the Legislature chooses not to remove this provision, the TGPC respectfully requests clarification of how conservation should be addressed in the Texas Groundwater Protection Strategy, and how the TGPC is to interact and coordinate with the WCAC.

§26.406, Groundwater Contamination Information and Reports; Rules

When this statute was crafted, the Legislature required that 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 required 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 Committee 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, in order to better fulfill the requirements of this section of the statute.

§26.407, Protection and Enhancement Plans

This statute was intended to address the plans for pesticide protection issues (State Management Plan or Pesticide Management Plan for the prevention of pesticide contamination of groundwater.) The TGPC performed commendably in the creation and updates of the state’s SMP through the actions of its Agricultural Chemicals Subcommittee, but the final federal rules for such management plans never fully materialized. While the TGPC and the TCEQ maintain the plans that were developed and continues a monitoring program for pesticides in groundwater, there is no federal or state “driver” behind this mandate.

The TGPC recommends that the statute be amended 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.

Abandoned Water Well Plugging and Education

The TGPC has recognized for 20 years that abandoned domestic, municipal, industrial, irrigation, and livestock wells, and unplugged test-holes are the most significant threat to groundwater quality in the state. Abandoned water wells not only serve as conduits or channels for contamination to reach groundwater, but large diameter wells can also be a hazard to human and animal life. Abandoned and deteriorated water wells exist in every county in the state and are at the top of the list of potential groundwater contamination sources that landowners can identify and eliminate.



(left to right) Justin Mechell (TAES), Ryan Gerlich (TAES), and Dirk Aaron (Clearwater UWCD), Abandoned Water Well Plugging Demonstration coordinated with Clearwater UWCD (Bell County), June 2009. Photo courtesy of Dirk Aaron (Clearwater UWCD)

State law requires landowners or other persons who possess an abandoned and/or deteriorated well to have the well plugged or capped under standards and procedures adopted by the TDLR. State law also authorizes the TDLR to assess administrative and civil penalties against persons who do not comply. However, these provisions represent a financial burden and provide little incentive for owners of abandoned wells to voluntarily plug them. Educational efforts, such as the TGPC’s Landowner’s Guide to Plugging Abandoned Water Wells and the associated video, may initiate some abandoned well plugging. While some groundwater conservation districts (GCDs) make match-funding available to landowners, a state funding source to assist landowners with abandoned well plugging efforts would result in an increase in the number of wells plugged and thus decrease the threats to groundwater quality.

The TGPC recommends the legislature provide positive incentives for landowner-initiated closure of abandoned and/or deteriorated water wells through the establishment of an abandoned well–plugging fund. Fund disbursement could be contingent upon prioritization of potential groundwater quality impacts, hazards, and the landowner’s assets. Further, 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. TDLR should work cooperatively with local GCDs to disburse monies for the plugging of abandoned and/or deteriorated water wells located within GCD 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 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 workshops and field days 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 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, U.S. Environmental Protection Agency, or other federal agencies to implement these activities.

Support, through legislative appropriations, programs which enable the TGPC member agencies to:

- **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**
- **Validate and verify the feasibility of desalination of moderately saline (brackish) groundwater in Texas and better characterize salinity levels of groundwater sources throughout the state**
- **Provide tools, educational programs, and assistance for landowners, citizens, local governments, and others to facilitate efforts such as the Water Supply Enhancement Program to increase groundwater yield, the Texas Well Owner Network Program, and the Texas High Plains Evapotranspiration Network**
- **Protect groundwater quality through technology transfer, educational programming, quantification monitoring, and regulatory protection.**

Activities 2011 & 2012

The TGPC carries out numerous administrative duties required by state law, such as developing this biennial report to the 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. TCEQ file photo.

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, presentations and roundtable discussions, business, information exchange, announcements, and public comment. In addition, agencies share and discuss current and ongoing rule development relating to the protection of groundwater. The TGPC regularly hosts groundwater-related presentations. Presentation topics during 2011 and 2012 included:

- Texas Groundwater Management: Joint Planning Process;
- Potential Sources of Anthropogenic Groundwater Contamination;
- Texas A&M Health Science Center's Program for Public Health and Water Research;
- Edwards Aquifer Recovery Implementation Program; and
- U.S. Geological Survey's Regional Groundwater Availability Study of the Edwards-Trinity Aquifer in parts of Pecos, Brewster, Jeff Davis and Reeves Counties, Texas.

The TGPC uses five subcommittees and the Nonpoint Source Task Force to perform much of its day-to-day work and to address issue and program development. The TGPC considers subcommittee findings and recommendations at regular meetings. The subcommittees include: Agricultural Chemicals, Public Outreach and Education, Groundwater Research, Data Management, and Legislative Report. During 2011 and 2012, the Public Education and Outreach and Agricultural Chemicals Subcommittees were the most active and their activities are described later in this chapter.

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 Groundwater Monitoring and Contamination Report

(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 October 2010. The next quadrennial rules review will be in 2014.

State law requires the TCEQ to be the TGPC's administrative agent, and like other state agencies, 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 uses an e-mail subscription service to notify all TGPC members, agency staff, and interested parties of upcoming meetings. 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 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 Legislature charged the TGPC with developing a comprehensive strategy for the state that includes guidelines for the prevention of groundwater contamination and for the conservation of groundwater, and provides for the coordination of the groundwater protection activities of all the agencies 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. Recognizing the changes that have occurred since the state's first groundwater protection strategy was developed, the TGPC decided in January 2001 to begin the process to update it. That process resulted in the document, Texas Groundwater Protection Strategy, TCEQ Publication No. AS-188, February 2003. The Strategy:

- details the state's groundwater protection goal as established by the Legislature;
- explains the statewide groundwater classification system and how the state identifies contamination and quantity issues;
- describes the roles and responsibilities of the various state agencies involved in groundwater protection and discusses the TGPC as a coordinating mechanism;
- provides examples of how the various state agencies implement groundwater protection programs through regulatory and non-regulatory models;
- explains how the local, state, and federal agencies coordinate management of groundwater data for the enhancement of groundwater protection;
- discusses the role that research plays in understanding groundwater's importance and the importance of coordinating research efforts;
- provides an overview of the groundwater public education efforts in the state; discusses public participation in establishing and implementing groundwater policy;
- lays out a planning process for updating the groundwater protection Strategy; proposes for inclusion in the next strategy an identification and ranking of significant threats to the state's groundwater resource, consideration of the vulnerability of groundwater resources, and a prioritization of actions to address those threats; and
- provides recommendations and possible actions to protect groundwater.

Groundwater Classification System

The TGPC and its member agencies recognize that groundwater classification is an important tool to be used 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 Response: 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.	
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.	
Very Saline to Brine	More than 10,000	Mineral extraction, oil and gas production.	Level II Response: Protection or restoration measures based on indirect exposure or no human consumption.

*Concentration range of Total Dissolved Solids in milligrams per liter (mg/l).

The TGPC has noted a great deal of recent interest in “brackish” groundwater resources as potential solutions to water demands for the state through desalination. The term “brackish” groundwater describes groundwater with a Total Dissolved Solids content of more than 3,000 mg/l to 10,000 mg/l, which corresponds to the “Moderately Saline” classification in the table above. The TGPC believes that the current classification system adequately identifies, and provides protection for this groundwater quality type, however, the use of the term “brackish”, without definition, to describe groundwater quality can be confusing. The Committee would prefer to see terminology from the Groundwater Classification System used instead of the term “brackish”, in order to insure consistency and understanding.

Strategy Update

While the 2003 document has provided a road map for the current activities of the TGPC, many of the short and medium term goals identified in the Strategy have been achieved and new goals need to be established. This was reported to the Legislature in 2011.

The planning process for updating the Strategy included a six year review cycle, and a review was begun in 2009. Several of the member agencies, however, were experiencing “sunset” review while the document was under consideration for revision, and the TGPC members elected to defer revision of the document until after “sunset” reviews were complete for member agencies, in order to incorporate the latest legislative changes into the Strategy. Some of the member agencies continue to undergo the “sunset” process into the 83rd Legislative Session, and the document remains under review.

Groundwater Monitoring Strategy

The TGPC has identified gaps in groundwater monitoring information, and has commissioned development of two versions of a monitoring plan or strategy for the state. While 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.

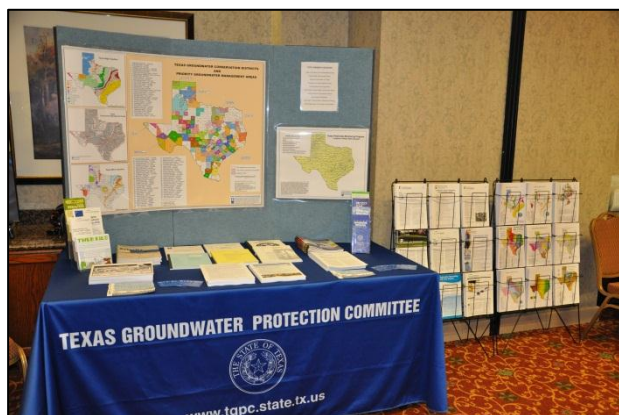
Additionally, funding for such an undertaking has been an issue, and TGPC members have been working on ways to work within our current means to provide as much groundwater quality data as possible.

The need for enhanced groundwater data is obvious – there have been high-profile incidents where comprehensive groundwater quality data could have avoided unnecessary Federal involvement, litigation and associated expenses for the state. The TGPC continues development of a comprehensive groundwater monitoring program that will be incorporated into the next Texas Groundwater Protection Strategy.

Public Outreach and Education

The TGPC Public Outreach and Education (POE) activities center on two overarching themes: (1) the protection of human health from contaminated groundwater or water that contains high levels of naturally occurring compounds that could affect human health, and (2) the protection of groundwater from contamination.

The POE Subcommittee developed a formal Groundwater Educational Outreach Plan with 10 focus areas in late 2006 and an associated Implementation Strategy with specific activities for each focus area in 2007. With much of this work now complete, the POE Subcommittee has conducted surveys (with GCDs, TAMAES offices, and TSSWCB Soil and Water Conservation Districts) and is researching other successful outreach programs (e.g., at the National Ground Water Association and Texas Well Owner Network) in preparation for updating its Outreach Plan.



TGPC exhibit booth at the TCEQ Public Drinking Water Conference, August 2012

During 2011 and 2012, the TGPC continued its sponsorship of exhibitor booths and displays at 18 Austin-area conferences, seminars, and meetings with 3,702 estimated visitors (10% of registered attendees). From its exhibitor booth, the TGPC distributed its trifold brochure and refrigerator magnets, state maps of various kinds (e.g., major and minor aquifers, river basins, precipitation, geology, and groundwater organizational areas), fact sheets, booklets, and a listing of groundwater publications available for download from the TGPC and other web sites. In addition, a TGPC-sponsored poster for National Groundwater Awareness Week was displayed in a dozen central Texas locations, including the Texas Capitol, in March 2011 and March 2012.

Abandoned water wells provide both a physical danger to human health and a direct conduit for pollution occurring at the surface to enter groundwater resources. Due to staff cutbacks and the 2011 drought, TAMAES did not hold any TGPC-supported abandoned water well closure (i.e., well-plugging) demonstrations in the last biennium, but planning is underway to resume this important activity in 2013.

During 2011 and 2012, the TAMAES conducted a number of TGPC-supported educational events targeting water well owners, and TGPC-supported drinking water fact sheets were used in conjunction with their water well testing program – 1,492 well samples were screened from 41 counties at 24 events (more than once in three of these counties). An Outreach Events Status Report, listing both recent and upcoming TGPC booth displays, abandoned water well closures, and water well screening events, is updated on the POE Subcommittee web page before each quarterly meeting.

The TGPC web site, <www.tgpc.state.tx.us>, was established in 2002 and 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 web site is a clearinghouse for many groundwater-related topics, supplying links to the web sites and publications of TGPC members and other organizations. Addressing one of the focus areas in their Groundwater Educational Outreach Plan and its Implementation Strategy, the POE Subcommittee added nine Frequently Asked Questions (FAQs) to the TGPC web site during the last two years; the 39 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), septic systems, water wells, administrative entities (e.g., GCDs, Regional Water Planning Groups, Municipal Settings Designations, Groundwater Management Areas, and Priority Groundwater Management Areas), and publications. These popular press articles assist state-wide newsletter editors and webmasters in disseminating groundwater-related information to the public.



John W. Smith (TAMAES), Private Water Well Screening Event, Granbury, Texas, June 2009. Photo courtesy of Marty Vahlenkamp (TAMAES).

An email subscription service with 5,041 recipients is used to notify the public of upcoming meetings and new TGPC web site information, and TGPC web site activity for first six months of 2012 averaged 64 unique visitors per day.

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. The report:

- describes the current status of groundwater monitoring activities conducted or required by each agency at regulated facilities or associated with regulated activities;
- contains a description of each case of groundwater contamination documented during the previous calendar year;
- provides a description of each case of contamination documented during previous periods for which enforcement action was incomplete at the time of issuance of the preceding report; and

- indicates the status of enforcement action for each case of contamination that is listed.

The TGPC produced and published two monitoring and contamination reports during the previous two years: Joint Groundwater Monitoring and Contamination Report—2010 (TGPC, 2011) and Joint Groundwater Monitoring and Contamination Report—2011 (TGPC, 2012).

The Joint Report describes the status of groundwater monitoring programs and groundwater contamination cases documented or under enforcement by the participating agencies for the calendar year. Data for the report comes from TGPC members and groundwater districts, with each member agency or organization providing the descriptions of their programs that protect groundwater. Each regulatory program with enforcement authority provides a brief description of each case of groundwater contamination, and the enforcement status for the case. Groundwater contamination cases are sorted in the report by regulatory agency, county and the specific regulatory program with jurisdiction over the case.

Groundwater Monitoring

The groundwater protection programs of the members of the TGPC generally fall within one of three categories:

- regulatory agencies requiring or conducting groundwater monitoring to assure compliance with guidelines and regulations for the protection of groundwater from discharges of contaminants;
- agencies or entities conducting groundwater monitoring to assess ambient or existing groundwater quality conditions and to track changes in water quality over time; and
- agencies or entities conducting 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 for the protection of groundwater from contaminants has its own monitoring program requirements and procedures. The criteria used to assess the need for groundwater monitoring vary among the regulatory entities. Currently, there are 23 regulatory monitoring programs within two state agencies described in the report. Of these programs, 18 require some form of groundwater monitoring.

Monitoring of groundwater quality for permit and operational requirements occurred at approximately 10,619 facilities statewide in 2011. Approximately 38,545 monitor wells were used in 2010, and 36,815 in 2011. The majority of the monitored facilities are under the jurisdiction of the TCEQ, with most of the remainder under the jurisdiction of the RCT.

The TWDB, GCDs, and the United States Geological Survey (USGS) conduct nonregulatory groundwater monitoring to assess ambient or existing groundwater quality conditions and to track changes in water quality over time. Some monitoring programs are developed for the assessment of water quality that 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 reported sampling approximately 553 sites in 2010 and 402 sites (wells and springs) in 2011. 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 water-quality data collected under this program in its groundwater database.

Groundwater Contamination

Groundwater contamination is defined by the TGPC for inclusion in the Joint Report (Title 31 Texas Administrative Code, Chapter 601). Contamination is 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 2010 and 2011 were gasoline, diesel fuel, and other petroleum products due to the large number of cases related to petroleum storage tank systems. Less common 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 4,265 documented groundwater contamination cases in the Joint Report for 2010 and 3,923 cases in 2011. Approximately 88.5 percent of the documented cases in 2011 were under the jurisdiction of the TCEQ. The remainder of the cases were under the jurisdiction of the RCT (with approximately 11.4 percent); and GCDs which are members of TAGD (with 1 case, or less than 0.1 percent).

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 2010 to 2011.

The Joint Reports for both 2010 and 2011 document the large number of groundwater contamination cases attributed to leaking petroleum storage tanks. As reported by the TCEQ, the number of documented groundwater contamination cases resulting from the failure of storage tank systems declined from 1,954 in 2010 to 1,604 in 2011. These numbers were down again from the 2,214 cases in 2009 that were reported in the previous edition of the Legislative Report.

While the number of documented contamination cases from petroleum storage tanks is high compared to other programs, it can be directly linked to the large number of regulated facilities. In 2011, there were 71,322 facilities containing registered petroleum storage tanks; and, although contamination from leaking petroleum storage tanks remains the largest category in the Joint Report, the number of cases has declined significantly from the 6,504 cases of contamination attributed to leaking petroleum storage tanks 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, indicate the effectiveness of new regulations implemented during the 1990s that provided for leaks to be caught and addressed before groundwater is impacted.

Table 2 also illustrates an increase in the number of active cases reported by the RCT. The RCT case count rose 3.2 percent between 2010 and 2011. Most of these cases are under the jurisdiction of the Oilfield Cleanup Program.

The TCEQ programs with an increase in the number of active cases between 2010 and 2011 are the Voluntary Cleanup program (13 cases), Innocent Owner/Operator Program (3 cases), Dry Cleaner Remediation Program (7 cases), and Industrial and Hazardous Waste Permitting (one case).

The Joint Report also indicates the status of enforcement action for each instance of groundwater contamination. For purposes of the Joint Report, enforcement action includes any agency action that accomplishes or requires the 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, while 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 correspondence 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 of the 3,923 cases listed in the 2011 report have documented groundwater contamination. The activity status for these cases is:

- No activity has occurred in 51 reported cases.
- Detection of contamination is confirmed (validated) in 301 cases.
- Investigations are ongoing for the largest number of cases (1,766).
- Corrective action planning is completed in 376 cases.
- Action has been implemented in 760 cases.
- Monitoring action is ongoing in 745 cases.
- No further action is necessary for 768 cases that are designated as "action completed."
- No activity status information was provided for five cases.

Table 2. Groundwater Contamination Cases by Jurisdictional Agency, 2010–2011

Agency Division Program	Total Cases		Change, 2010-2011		Percent of Total	
	2010	2011	Net	%	2010	2011
Texas Commission on Environmental Quality						
<i>Radioactive Materials Division programs</i>						
Radioactive Materials Licensing	1	1	0	0	0.02	0.03
Uranium and Technical Assessments	3	3	0	0	0.07	0.08
<i>Remediation Division programs:</i>						
Brownfield Site Assessment	5	5	0	0	0.11	0.13
Corrective Action	602	580	-22	-3.7	14.1	14.8
Dry Cleaner Remediation	177	184	7	4.0	4.15	4.69
Innocent Owner/Operator	183	186	3	1.6	4.29	4.74
Petroleum Storage Tank	1,954	1,604	-350	-17.9	45.8	40.9
Superfund Cleanup	89	87	-2	-2.2	2.09	2.22
Superfund Site Discovery and Assessment	17	14	-3	-17.6	0.39	0.36
Voluntary Cleanup	710	723	13	1.7	16.6	18.4
<i>Waste Permits Division programs:</i>						
Municipal Solid Waste	60	60	0	0	1.41	1.53
Industrial and Hazardous Waste	1	2	1	100	0.02	0.06

Agency Division Program	Total Cases		Change, 2010-2011		Percent of Total	
	2010	2011	Net	%	2010	2011
<i>Water Quality Division</i> Water Quality Assessment Program	16	16	0	0	0.37	0.41
<i>Water Supply Division programs:-</i>						
Public Drinking Water	4	0	-4	-100	0.09	0.00
Water Rights Permits and Availability	5	4	-1	-20	0.12	0.10
<i>Enforcement Division</i>	4	4	0	0	0.08	0.10
<i>Regional Offices</i>	3	1	-2	-66.7	0.09	0.03
Subtotal, all TCEQ programs	3,831	3,475	-356	-9.3	89.8	88.6
Railroad Commission of Texas <i>Oil and Gas Division</i>	433	447	14	3.2	10.1	11.4
Texas Alliance of Groundwater Districts	1	1	0	0	0.02	0.03
Total	4,265	3,923	-342	-8.0	100	100

Historically, the number of new groundwater contamination cases documented each year was greater than the number of cases in which action was completed during the same year. This trend had held from the first published Joint Report in 1989, but in 2000, the trend reversed, and has continued through 2011. In 2010, 729 cases were listed as action completed, and 384 new cases were reported. In 2011, 768 cases were listed as action completed, and 365 new cases were reported. A summary of the changes since 1993 is contained in the 2011 report.

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 2011 and 2012, 830 notices were mailed for 60 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. 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 Agricultural Chemicals Subcommittee (ACS).

The PMP explains the general policies and regulatory and non-regulatory approaches the state will use to protect groundwater resources from contamination by pesticides. The document explains a generic coordinating mechanism among all responsible and participating agencies during the implementation of the PMP and provides for specific responses when it is deemed necessary to take actions 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 ACS. The ACS has designated five task forces through which it carries out its work:

- The PMP Task Force has been charged to revise the PMP, if necessary, and to develop and assess the lists of Pesticides of Interest and Pesticides of Concern.

- The Education Task Force develops PMP-related educational information and materials and coordinates educational outreach including public presentations, displays, applicator certification curriculum development, and brochures.
- The Site Selection Task Force guides in the development of pesticide-specific groundwater monitoring and investigation strategies for determining the extent of contamination.
- The Data Evaluation and Interpretation Task Force reviews and evaluates the available information to determine the probable source and cause of any contamination revealed by monitoring. If monitoring reveals contamination the Task Force coordinates the state's response under the PMP.
- The Best Management Practices (BMP) Task Force is responsible for developing the preventive component of the generic PMP and identifying pesticide-specific and area-specific BMPs that can be used to prevent or curtail pesticide contamination of groundwater.

Currently, the ACS is working 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 BMPs in problem areas.

Monitoring efforts have been enhanced through a cooperative sampling effort among the TWDB, a number of GCDs, and the TCEQ. During the most recent round of cooperative monitoring, 211 well samples and 36 quality assurance samples were taken in 2011, with a total of 247 immunoassay analyses for atrazine. This monitoring continues to indicate only occasional low-level detections of atrazine in the state exclusive of the Panhandle. All cooperative monitoring atrazine detections have been below the maximum contaminant level for drinking water. One additional cooperative monitoring effort took place in the Panhandle in 2012. The pesticide program staff conducted follow-up monitoring

at several potential State Superfund sites having wells with high concentrations of atrazine.



Alan Cherepon (TCEQ) during pesticide field sampling trip. TGPC file photo.

On-going monitoring efforts have been conducted at several sites in the central Panhandle, collecting 22 well samples in both 2011 and 2012. These activities continued throughout the biennium to track and to address atrazine detections in public water supply wells. Monitoring reveals that atrazine concentrations have primarily decreased or remain the same over the past five years.

Pesticide monitoring was also conducted in the Lower Rio Grande Valley and Corpus Christi areas in 2011. Eighteen samples were collected in these areas, with only low concentrations of atrazine and propazine detected.

TGPC sponsored a table display at the annual Texas Plant Protection Conference in December 2011 and at the annual TCEQ Environmental Trade Fairs in May 2011 and 2012. These displays explained the PMP program in Texas through the distribution of brochures and the exposition of various pesticide monitoring graphics, including maps of water wells monitored for pesticides in Texas.

Appendix 1. Texas Groundwater Protection Committee Membership

Chairman—Texas Commission on Environmental Quality	
Zak Covar, Executive Director, MC-109 Texas Commission on Environmental Quality PO Box 13087 Austin TX 78711-3087 Telephone: 512-239-3900 Fax: 512-239-3939	<i>Designated Chairman:</i> Cary L. Betz, PG, Staff Geologist Water Availability Division, MC-147 Texas Commission on Environmental Quality PO Box 13087 Austin TX 78711-3087 Telephone: 512-239-4506 Fax: 512-239-4450 E-mail: cary.betz@tceq.texas.gov
Vice-Chairman—Texas Water Development Board	
Melanie Callahan, Executive Administrator Texas Water Development Board PO Box 13231 Austin TX 78711-3231 Telephone: 512-463-7850 Fax: 512-475-2053	<i>Designated Vice-Chairman:</i> Larry French, PG, Director Groundwater Resources Division Texas Water Development Board PO Box 13231 Austin TX 78711-3231 Telephone: 512-463-5067 Fax: 512-936-0816 E-mail: larry.french@twdb.texas.gov
Railroad Commission of Texas	
Milton Rister, Executive Director Railroad Commission of Texas PO Box 12967 Austin TX 78711-2967 Telephone: 512-463-7068 Fax: 512-463-7000	<i>Designated Representative:</i> Peter Pope, PG, Assistant Director Site Remediation Section Oil and Gas Division Railroad Commission of Texas PO Box 12967 Austin TX 78711-2967 Telephone: 512-463-8202 Fax: 512-463-7005 E-mail: peter.pope@rrc.state.tx.us
9Texas State Soil and Water Conservation Board	
Rex Isom, Executive Director Texas State Soil and Water Conservation Board PO Box 658 Temple TX 76503-0658 Telephone: 254-773-2250 Fax: 254-773-3311	<i>Designated Representative:</i> Richard Egg, Statewide Programs Engineer Texas State Soil and Water Conservation Board PO Box 658 Temple TX 76503-0658 Telephone: 254-773-2250, ext. 246 Fax: 254-773-3311 E-mail: regg@tsswcb.texas.gov
Texas Department of Agriculture	
Drew DeBerry, Deputy Commissioner Texas Department of Agriculture PO Box 12847 Austin TX 78711-2847 Telephone: 512-463-1408 Fax: 800-831-3884	<i>Designated Representative:</i> Richard Eyster, P.G., Department Hydrologist Texas Department of Agriculture PO Box 12847 Austin TX 78711-2847 Telephone: 512-463-7426 Fax: 888-216-9834 E-mail: richard.eyster@texasagriculture.gov

Department of State Health Services	
<p>David Lakey, MD, Commissioner Department of State Health Services 1100 West 49th Street Austin TX 78756 Telephone: 512-458-7375 Fax: 512-458-7477</p>	<p><i>Designated Representative:</i> Ken Ofunrein, Group Manager Department of State Health Services 8407 Wall Street Austin TX 78754 Telephone: 512-834-6600 Fax: 512-834-6644 E-mail: ken.ofunrein@dshs.state.tx.us</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 Telephone: 512-463-7880 Fax: 512-463-8616 E-mail: david@license.state.tx.us</p>	<p><i>Designated Representative:</i> Same</p>
Texas Alliance of Groundwater Districts	
<p>Kathy Turner Jones, General Manager Lone Star GCD President, Texas Alliance of Groundwater Districts (TAGD) PO Box 2467 Telephone: 936-494-3436 Fax: 936-494-3438</p>	<p><i>Designated Representative</i> David Van Dresar, General Manager Fayette County GCD Vice President, TAGD 255 Svoboda Lane, Room 115 La Grange TX 78945 Telephone: 979-968-3135 Fax: 979-968-3194 E-mail: david@fayettecountygroundwater.com</p>
Texas A&M AgriLife Research	
<p>Craig Nessler, PhD, Director Texas A&M AgriLife Research 2142 TAMU College Station TX 77843-2142 Telephone: 979-862-3746 Fax: 979-862-1637</p>	<p><i>Designated Representative</i> Roel Lopez, PhD, Interim Director Texas Water Resource Institute 2118 TAMU College Station TX 77843-2118 Telephone: 979-845-1851 Fax: 979-845-0662 E-mail: roel@tamu.edu</p>
Bureau of Economic Geology	
<p>Scott Tinker, PhD, Director Bureau of Economic Geology Jackson School of Geosciences The University of Texas at Austin University Station, Box X Austin TX 78713-8924 Telephone: 512-471-1534 Fax: 512-471-0140</p>	<p><i>Designated Representative</i> Bridget Scanlon, PhD, Senior Research Scientist Bureau of Economic Geology Jackson School of Geosciences The University of Texas at Austin University Station, Box X Austin TX 78713-8924 Telephone: 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 (February 2003). <www.tceq.texas.gov/assets/public/comm_exec/pubs/as/188.pdf>

Joint Groundwater Monitoring and Contamination Report – 2010. TCEQ publication SFR-056/10 (September 2011). < http://www.tceq.texas.gov/publications/sfr/056/056_10_index.html >

Joint Groundwater Monitoring and Contamination Report – 2009. TCEQ publication SFR-056/09 (August 2010). < http://www.tceq.texas.gov/publications/sfr/056/056_09_index.html >

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 Groundwater Data Dictionary. TNRCC publication GI-272 (August 1996). <www.tgpc.state.tx.us/gi-272.pdf>

Landowner's Guide to Plugging Abandoned Water Wells. TCEQ publication RG-347 (March 2010). < <http://www.tceq.texas.gov/publications/rg/rg-347.html> >

Drinking Water Problems Fact Sheets

Arsenic. Texas A&M AgriLife Extension Service publication (in English) L-5467 (December 2005) and (in Spanish) L-5467S (June 2006).

Perchlorate. Texas A&M AgriLife Extension Service publication (in English) L-5468 (November 2005) and (in Spanish) L-5468S (February 2006).

Nitrates. Texas A&M AgriLife Extension Service publication (in English) B-6184 (May 2006) and (in Spanish) B-6184S (May 2006).

Radionuclides. Texas A&M AgriLife Extension Service publication (in English) B-6192 (July 2006) and (in Spanish) B-6192S (November 2006).

MTBE. Texas A&M AgriLife Extension Service publication (in English) L-5502 (June 2008).

Benzene. Texas A&M AgriLife Extension Service publication (in English) L-5513 (April 2009).

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

On-site Wastewater Treatment Systems Fact Sheets

Homeowner's Guide to Evaluating Service Contracts. Texas A&M AgriLife Extension Service publication (in English) B-6171 (July 2005).

Graywater. Texas A&M AgriLife Extension Service publication (in English) B-6176 (October 2005).

Understanding and Maintaining Your Septic System. Texas A&M AgriLife Extension Service publication (in English) L-5491 (March 2008).

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

Water Wells Fact Sheets

Capping of Water Wells for Future Use. Texas A&M AgriLife Extension Service publication (in English) L-5490 (August 2007).

Plugging Abandoned Water Wells. Texas A&M AgriLife Extension Service publication (in English) B-6238 (April 2010).

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

Pesticides Best Management Practices Trifold Brochure

Keep Pesticides Out of Texas Water Supplies – Best Management Practices to Prevent Pesticide Contamination. Texas A&M AgriLife Extension Service publication (in English) L-5500 (July 2008).

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



Aby Berehe (TCEQ) sampling a water well in the Texas Panhandle. TGPC file photo.

National Groundwater Awareness Week

March 10 – 16, 2013

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



A public water supply wellhead in San Antonio, TX



Comal Springs in New Braunfels, TX

Groundwater provides an estimated*

NATIONWIDE	TEXAS
<ul style="list-style-type: none">● 23% of all freshwater withdrawals● 42% of agricultural use (mostly for irrigation)● 33% of the public water supply withdrawals● 98% of drinking water for the rural population	<ul style="list-style-type: none">● 60% of all freshwater withdrawals● 80% 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 Texas Water Development Board, and the Texas Commission on Environmental Quality*

- Ninety percent of Texans depend on public drinking water supplies. Twenty-eight percent of that supply, 1,210 million gallons per day, is from groundwater, serving over 5,323,000 Texans.
- There are 12,212 active public water supply wells in Texas ranging in depth from 17 to 5,400 feet.
- Nine major aquifers and 21 minor aquifers supply 60% of all the water used in the state.
- In addition, 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.

For more information on groundwater issues in Texas, visit the Texas Groundwater Protection Committee's website at <http://www.tgpc.state.tx.us>