CHAPTER TWO

Agency Activities

The following summarizes the agency's fiscal 2015 and 2016 activities regarding enforcement, air and water quality, water availability, waste management, and environmental assistance.

Enforcement

Environmental Compliance

The TCEQ enforcement process begins when a violation is discovered during an investigation at the regulated entity's location, through a review of records at agency offices, or as a result of a complaint from the public that is subsequently verified by the agency as a violation. Enforcement actions may also be triggered after submission of citizen-collected evidence.

In a typical year, the agency will conduct about 105,000 routine investigations and investigate about 4,000 complaints to assess compliance with environmental laws.

When environmental laws are violated, the agency has the authority in administrative cases to levy penalties up to the statutory maximum—as high as $25,000—per day, per violation. Civil judicial cases carry penalties up to $25,000 per day, per violation, in some programs.

In fiscal 2015, the TCEQ issued 1,681 administrative orders, which required payments of over $12.6 million in penalties and over $3.5 million for Supplemental Environmental Projects (SEPs). The average number of days from initiation of an enforcement action to completion (order approved by the commission) was 236 days.

In fiscal 2016, the TCEQ issued 1,404 administrative orders, which required payments of approximately $9 million in penalties and $3.2 million for SEPs. The average number of days from initiation of an enforcement action to completion (order approved by the commission) was 260 days.

The TCEQ can also refer cases to the state attorney general. In fiscal 2015, the AG's office obtained 46 judicial orders in cases referred by the TCEQ or in which the TCEQ was a party. These orders resulted in more than $16.1 million in civil penalties. In fiscal 2016, the AG's office obtained 31 judicial orders, which resulted in approximately $1.4 million in civil penalties.

Additional enforcement statistics can be found in the agency's annual enforcement report, available online at <www.tceq.texas.gov/goto/aer>.

Orders that have been approved by the commission and have become effective are posted on the agency's website, as are pending orders not yet presented to the commission.

Supplemental Environmental Projects

When the TCEQ finds a violation of environmental laws, the agency and the regulated entity often enter into an agreed administrative order, which regularly includes the assessment of a monetary penalty. The penalties collected do not stay at the agency, but instead go to state general revenue.

One option under state law, however, gives regulated entities a chance to direct some of the penalty dollars to local environmental improvement projects. By agreeing that penalty amounts can be used for a SEP, the violator can do something beneficial for the community in which the environmental offense occurred. Such a project must reduce or prevent pollution, enhance the environment, or raise public awareness of environmental concerns.

The agency has a list of preapproved SEPs, which consists of projects that have already received general approval from the commission. The list includes nonprofits and governmental agencies that sponsor activities such as cleaning up illegal dump sites, providing first-time adequate water or sewer service for low-income families, retrofitting or replacing school buses with cleaner emission technologies, removing hazards from bays and beaches, and improving nesting conditions for colonial water birds.

A regulated entity that meets program requirements may propose its own custom SEP if the proposed project

is environmentally beneficial and the party performing the SEP was not already obligated or planning to perform the SEP activity before the violation occurred. Additionally, the activity covered by a SEP must go beyond what is already required by state and federal environmental laws.

The Texas Water Code gives the TCEQ the discretion to allow local governments cited in enforcement actions to use SEP money to achieve compliance with environmental laws or to remediate the harm caused by the violations in the case. This compliance SEP may be offered to governmental authorities such as school districts, counties, municipalities, junior-college districts, river authorities, or water districts.

Other than compliance SEPs, a SEP cannot be used to remediate a violation or any environmental harm caused by a violation, or to correct any illegal activity that led to an enforcement action.

TCEQ Enforcement Orders

	Number of Orders	Assessed Penalties	Orders with SEPs	SEP Funds
FY2015	1,681	$12.6 million	187	$3.5 million
FY2016	1,404	$9 million	177	$3.2 million

Compliance History

Since 2002, the agency has rated the compliance history of every owner or operator of a facility that is regulated under certain state environmental laws.

An evaluation standard has been used to assign a rating to approximately 353,000 entities regulated by the TCEQ that are subject to the compliance-history rules. The ratings take into consideration prior enforcement orders, court judgments, consent decrees, criminal convictions, and notices of violation, as well as investigation reports, notices, and disclosures submitted in accordance with the Texas Environmental, Health, and Safety Audit Privilege Act. Agency-approved environmental management systems and participation in agency-approved voluntary pollution-reduction programs are also taken into account.

An entity's classification comes into play when the TCEQ considers not only enforcement but also permit actions, the use of unannounced investigations, and participation in innovative programs.

Each September, regulated entities are classified or reclassified to reflect the previous five years. Ratings below 0.10 receive a classification of "high," which means those entities have an above-satisfactory compliance record with environmental regulations. Ratings from 0.10 to 55.00 merit "satisfactory" for having generally complied. Ratings greater than 55.00 result in an "unsatisfactory" classification, because these entities performed below minimal acceptable performance standards.

An entity with no compliance information for the last five years will not receive a classification and is therefore unclassified.

Critical Infrastructure

In 2011, the TCEQ created the Critical Infrastructure Division within the Office of Compliance and Enforcement. This division combines elements from the OCE that are critical to the agency's responsibilities under the Texas Homeland Security Strategic Plan. The division seeks to ensure compliance with environmental regulations and, during disasters, to support regulated critical infrastructures that are essential to the state and its residents. This duty includes not only responding to disasters but also aiding in recovery from them.

The division's programs are Homeland Security, Dam Safety, and Emergency Management Support.

Compliance-History Designations

	September 2015		September 2016	
Classifications	Number of Entities Subject to Compliance-History Rules	Percent	Number of Entities Subject to Compliance-History Rules	Percent
High	40,145	10.23	36,025	10.21
Satisfactory	10,519	2.68	10,127	2.87
Unsatisfactory	1,240	0.32	906	0.26
Unclassified	40,414	86.77	305,765	86.66
Total	392,318	100	352,823	100

Homeland Security

The Homeland Security Section coordinates communications during disaster response with federal, state, and local partners; conducts threat assessments to the state's critical infrastructure; participates in the state's counterterrorism task forces; oversees the Tier II Chemical Reporting Program; and, coordinates the BioWatch program in Texas. The latter is a federally funded initiative aimed at early detection of bioterrorism agents.

The Homeland Security Section is also responsible for compliance at the disposal site for low-level radioactive waste in Andrews County. The operator of the disposal site is Waste Control Specialists, Inc. (radioactive-material license R04100). The site's compact waste facility was authorized to accept waste in April 2012.

The Homeland Security Section maintains two full-time resident inspectors at the low-level radioactive waste site to accept, survey, and approve the disposal of each shipment. Each disposal is documented in an investigation report. The following shipments of low-level radioactive waste were inspected and successfully disposed of in the compact waste facility:

- fiscal 2015: 219 shipments
- fiscal 2016: 129 shipments

Dam Safety

The Dam Safety Program monitors and regulates private and public dams in Texas. The program periodically inspects dams that pose a high or significant hazard and issues recommendations and reports to the dam owners to help them maintain safe facilities. The program ensures that these facilities are constructed, maintained, repaired, or removed safely.

High- or significant-hazard dams are those at which loss of life could occur if the dam should fail.

On Sept. 1, 2013, a new state law exempted a large number of dams from the Dam Safety Program. These dams had to meet all of the following criteria:

- be privately owned,
- be classified either "low hazard" or "significant hazard,"
- have a maximum capacity less than 500 acre-feet,
- be within a county with a population of less than 350,000, and
- be outside city limits.

As a result, the law permanently exempted 3,227 dams.

In 2016, Texas had 3,984 state-regulated dams; of those, 1,274 were high-hazard dams and 409 were significant-hazard dams. The remaining dams were classified as low hazard.

As of August 2016, 72 percent of all high- and significant-hazard dams had been inspected during the past five years. About 134 of the inspected dams are in either "fair" or "poor" condition. The majority of owners have begun making repairs, as funds are available.

In addition to inspections, the Dam Safety Program conducts workshops—primarily for dam owners and engineers—on emergency action plans and dam maintenance. Emergency management personnel also attend. Three workshops were conducted in fiscal 2016.

Emergency Management Support

The TCEQ's 16 regional offices form the basis of the agency's support for local jurisdictions addressing emergency and disaster situations. For that reason, Disaster-Response Strike Teams (DRSTs), organized in each regional office, serve as the TCEQ's initial and primary responding entity during a disaster within the respective regions. Team members come from various disciplines and have been trained in the National Incident Management System, Incident Command System, and TCEQ disaster-response protocols.

The agency's Emergency Management Support Team (EMST), based in Austin, was created to build greater disaster-response capabilities within each TCEQ region and to support the regions when necessary. The EMST will join the regional DRST during a disaster response.

The EMST is also responsible for maintaining preparedness, assisting with the development of the DRSTs in each region by providing enhanced disaster preparedness training, and maintaining sufficiently trained personnel so that response staff can rotate during long-term emergency events.

Tier II Chemical Reporting Program

House Bill 942, 84th Legislature, was signed into law by Governor Abbott on June 16, 2015. The legislation transferred the Tier II Chemical Reporting Program from the Texas Department of State Health Services (DSHS) to the TCEQ effective Sept. 1, 2015, including the transfer of 11 full-time-equivalent positions, equipment, and resources from the DSHS. A new position was also created to develop and administer a Tier II Grant Program.

The Texas Tier II Chemical Reporting Program is the state repository for annual hazardous-chemical inventories, called Texas Tier II Reports, required under the Emergency Planning and Community Right-to-Know Act.

Texas Tier II Reports contain detailed information on chemicals that meet or exceed specified reporting thresholds at any time during a calendar year. The Tier II reporting system identifies facilities and owner-operators, and collects detailed data on hazardous chemicals stored at reporting facilities within the state. There are over 77,000 facilities in the data system. A total of 78,439 Tier II reports were received for the reporting period of Jan. 1–March 1, 2016.

Accredited Laboratories

The TCEQ only accepts regulatory data from laboratories accredited according to standards set by the National Environmental Laboratory Accreditation Program (NELAP) or from laboratories that are exempt from accreditation, such as a facility's in-house laboratory.

The analytical data produced by these laboratories are used in TCEQ decisions relating to permits, authorizations, compliance actions, enforcement actions, and corrective actions, as well as in characterizations and assessments of environmental processes or conditions.

All laboratories accredited by the TCEQ are held to the same quality-control and quality-assurance standards. TCEQ laboratory accreditations are recognized by other states using NELAP standards and by some states that do not operate accreditation programs of their own.

In August 2016, the number of laboratories accredited by the TCEQ was 272.

Sugar Land Laboratory

The TCEQ Sugar Land Laboratory, which is accredited by NELAP, serves the agency's 16 regional field offices. The laboratory performs routine analyses that support the environmental-monitoring programs of the TCEQ, river authorities, and other environmental partners.

The Sugar Land Laboratory supports monitoring operations for the TCEQ's air, water, and waste programs through laboratory analysis of surface water, wastewater, sediments, sludge samples, and airborne particulate matter for a variety of environmental contaminants.

The laboratory also analyzes samples collected as part of investigations conducted by the agency's Office of Compliance and Enforcement. The laboratory develops analytical procedures and performance measures for accuracy and precision, and maintains a highly qualified team of analytical chemists, laboratory technicians, and technical support personnel.

The laboratory generates scientifically valid and legally defensible test results under its NELAP-accredited quality system. Analytical data are produced using methods approved by the EPA. The laboratory standards used for these methods are traceable to national standards, such as the National Institute of Standards and Technology and the American Type Culture Collection.

With the rapid transmission of electronic data, the TCEQ can upload results directly to program databases.

Edwards Aquifer Protection Program

As a karst aquifer, the Edwards Aquifer is one of the most permeable and productive groundwater systems in the United States. The regulated portion of the aquifer crosses eight counties in south central Texas, serving as the primary source of drinking water for more than 2 million people in the San Antonio area. This replenishable system also supplies water for farming and ranching, manufacturing, generation of electric power using steam, mining, and recreation.

The aquifer's pure spring water also supports a unique ecosystem of aquatic life, including a number of threatened and endangered species.

Because of the unusual nature of the aquifer's geology and biology—and its role as a primary water source—the TCEQ requires an Edwards Aquifer protection plan for any regulated activity proposed within the recharge, contributing, or transition zones. Regulated activities include construction, clearing, excavation, or anything that alters the surface or possibly contaminates the aquifer and its surface streams. Best management practices are mandatory during and after construction to treat stormwater in the regulated areas.

Each year, the TCEQ receives hundreds of plans to be reviewed by the Austin and San Antonio regional offices. Since 2012, the agency has experienced a dramatic increase in the number of plans submitted for review as a result of increased development in both regions. The TCEQ reviewed 723 plans in fiscal 2015 and 822 plans in fiscal 2016.

In addition to reviewing plans for development within the regulated areas, agency personnel conduct compliance investigations to ensure that best management practices are appropriately used and maintained. The staff

also performs site assessments before the start of regulated activities to ensure that aquifer-recharge features are adequately identified for protection.

Air Quality

Changes to Standards for Criteria Pollutants

The federal Clean Air Act requires the EPA to review the standard for each criteria pollutant every five years to ensure that it achieves the required level of health and environmental protection. Federal clean-air standards, or the National Ambient Air Quality Standards (NAAQS), cover six air pollutants: ozone, particulate matter, carbon monoxide, lead, nitrogen dioxide, and sulfur dioxide. Attaining the ozone standard continues to be the biggest air quality challenge in Texas.

As Texas develops proposals—region by region—to address air quality issues, it submits the revisions to the EPA in the State Implementation Plan (SIP).

Ozone Compliance Status

Ground-level ozone, a component of smog, is not emitted directly into the air, but forms through a reaction of nitrogen oxides and volatile organic compounds in the presence of sunlight. The major sources of NO_X and VOC emissions are industrial facilities, electric utilities, car and truck exhaust, and chemical solvents. Identifying control measures that are reasonable—as well as technologically and economically feasible—has presented a challenge for the TCEQ, considering the magnitude of emission reductions already achieved under previous ozone standards.

On May 21, 2012, the EPA published final designations for the 2008 eight-hour ozone standard of 0.075 parts per million (ppm). The Dallas–Fort Worth area was designated "nonattainment," with a "moderate" classification and the Houston-Galveston-Brazoria area was designated "nonattainment," with a "marginal" classification. The attainment demonstration and reasonable further progress SIP revisions for the DFW 2008 eight-hour ozone nonattainment area were adopted in June 2015. The DFW area is required to attain the 2008 eight-hour ozone standard by July 20, 2018; the HGB area was required to do so by July 20, 2015, but did not attain by that date. It is anticipated that the EPA will reclassify the HGB area to moderate nonattainment in December 2016. The HGB area's new attainment deadline will presumably be July 20, 2018, with a 2017 attainment year, which is the year that the area must attain the applicable standard. The submission of the HGB SIP revision for the EPA's reclassification is Jan. 1, 2017.

Currently, the EPA has approved the state's redesignation substitute for the HGB area one-hour ozone nonattainment area and has proposed approval for the one-hour DFW ozone nonattainment area as well as the 1997 eight-hour ozone nonattainment areas for HGB and DFW. If approved, the redesignation substitute replaces the previous designation.

Ozone Compliance Status

Area of Texas	2008 Eight-Hour Ozone	Attainment Deadline
Houston-Galveston-Brazoria	Marginal	7/20/2015
Dallas–Fort Worth	Moderate	7/20/2018
Beaumont–Port Arthur, El Paso, Austin, Corpus Christi, Victoria, San Antonio, East Texas, Waco	Attainment	n/a

Note: The Houston-Galveston-Brazoria area includes the counties of Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller. The Dallas–Fort Worth area includes the counties of Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant, and Wise.

2015 Eight-Hour Ozone Standard

In October 2015, the EPA finalized the 2015 eight-hour ozone standard of 0.070 parts per million. State recommendations that are due to the EPA on Oct. 1, 2016 will be based on the latest complete monitoring data available at that time (2013 through 2015). The EPA will make final designations by Oct. 1, 2017, and will use design values from 2014 through 2016.

2010 Sulfur Dioxide Standard

The EPA revised the sulfur dioxide (SO_2) NAAQS in June 2010, adding a one-hour primary standard of 75 parts per billion. In July 2013, the EPA designated 29 areas in 16 states in nonattainment of the 2010 standard, none of

Types of Sources

Emissions that affect air quality can be characterized by their sources.

Point sources: industrial facilities such as refineries and cement kilns

Area sources: dry cleaners, gasoline stations, and residential heating

On-road mobile sources: cars and trucks

Non-road mobile sources: construction equipment and engines, such as locomotives

which are in Texas. On March 3, 2015, a U.S. District Court Order set deadlines for the EPA to complete designations for the SO_2 NAAQS. It requires that EPA designate by July 2, 2016, any areas monitoring violations or with the largest SO_2 sources fitting specific criteria for SO_2 emissions. A subsequent court deadline for some of these areas to be designated has been extended to Aug. 31, 2016, for some sources and Oct. 30, 2016, for other sources. Sources with more than 2,000 tons per year of SO_2 emissions not designated in 2016 will be designated based on modeling data by December 2017 or monitoring data by December 2020. Currently, there are no areas in Texas monitoring nonattainment for SO_2 and not all SO_2-emission sources have ambient monitors nearby.

Per the August 2015, 2010 SO_2 NAAQS Data Requirements Rule (DRR), Texas identified 25 sources with 2014 SO_2 emissions of 2,000 tons per year or more. The EPA was notified of these on Jan. 15, 2016. On April 22, 2016 the TCEQ requested revision of the list down to 24 sources, and the EPA concurred on May 16, 2016. The DRR required Texas to inform the EPA by July 1, 2016 of the approach to air quality characterization planned for each of the 24 source locations listed. For any of those 24 sources that will not be designated in July, August, or October 2016 and that the TCEQ intends to evaluate with modeling, the protocols were also due by July 1, 2016, completed analyses are due by Jan. 13, 2017, and ongoing annual emission-inventory review and reporting to the EPA is required. Where the TCEQ intends to evaluate sources through ambient monitoring, the DRR requires appropriately sited monitors in operation by Jan. 1, 2017. Information about these planned monitoring sites was submitted to the EPA by July 1, 2016 as part of the TCEQ's Annual Monitoring Network Plan. The TCEQ's 2016 plan, which includes information about the new SO_2 monitoring sites planned, was presented for public comment on May 16, 2016.

2008 Lead Standard

In 2008, the EPA revised the primary standard for lead from 1.5 to 0.15 micrograms per cubic meter ($\mu g/m^3$), measured in total suspended particulate matter. Effective in late 2010, a portion of Collin County—surrounding the Exide Technologies facility for recycling lead-acid batteries in Frisco—was designated "nonattainment" for the 2008 lead standard.

After the commission adopted the Collin County Attainment Demonstration SIP Revision and Exide's agreed order, Exide elected to permanently close operations at its Frisco Battery Recycling Center. Most structures at the site have been demolished. Compliance with the lead standard is based on 36 three-month rolling averages. Between Jan. 1, 2013, and Dec. 31, 2015, the Collin County area did not have a three-month rolling average above the lead NAAQS. Therefore, the area achieved compliance with the 2008 lead NAAQS as of Dec. 31, 2015. The TCEQ has developed a request to the EPA that the Frisco lead nonattainment area be redesignated to attainment based on 36 months of monitoring data below the federal standard. The commission approved proposal to request redesignation of Collin County to attainment for the 2008 lead NAAQS on April 27, 2016. Adoption of the SIP revision is scheduled for October 2016.

Particulate-Matter Standards

The final rule for PM NAAQS was announced on Dec. 14, 2012. For particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$), the EPA lowered the annual primary standard to 12 $\mu g/m^3$ and retained the current 24-hour primary standard of 35 $\mu g/m^3$ using a three-year annual average. The EPA retained the current standard for particles with an aerodynamic diameter less than or equal to a nominal

10 micrometers (PM_{10}). Existing secondary standards for both $PM_{2.5}$ and PM_{10} were also retained. No counties in Texas are currently designated "nonattainment" nor are in maintenance status for the primary annual and 24-hour $PM_{2.5}$ standards.

On Dec. 18, 2014, the EPA issued final area designations for the 2012 $PM_{2.5}$ NAAQS. The EPA designated all areas of Texas unclassifiable or in attainment. However, the El Paso area is classified as a moderate nonattainment area for the PM_{10} standard. El Paso was one of the original areas designated in nonattainment in 1990 under the amendments to the federal Clean Air Act and is influenced by natural events such as windstorms.

In April 2015, the newest near-road monitors became operational in DFW and HGB. Monitors in the Austin–Round Rock and San Antonio areas will be operational on Jan. 1, 2017. In 2015, the TCEQ's Monitoring Division deployed new ambient-air-monitoring equipment in Edinburg. The device has equipment for monitoring $PM_{2.5}$, PM_{10}, and meteorology and meets federal requirements.

Evaluating Health Effects

TCEQ toxicologists meet their goals of identifying chemical hazards, evaluating potential exposures, assessing human health risks, and communicating risk to the general public and stakeholders in a variety of ways. Perhaps most notably, the TCEQ relies on health- and welfare-protective values developed by its toxicologists to ensure that both permitted and monitored airborne concentrations of pollutants stay below levels of concern. Values for over 98 pollutants have been derived so far. Texas has received compliments from numerous federal agencies and academic institutions, and many other states and countries use the TCEQ's values.

TCEQ toxicologists use the health- and welfare-protective values it derives for air monitoring—for example, air-monitoring comparison values (AMCVs)—to evaluate the public-health risk of millions of measurements of air-pollutant concentrations collected from the ambient-air-monitoring network throughout the year.

When necessary, the TCEQ also conducts health effects research on particular chemicals with limited or conflicting information. In fiscal 2016 and 2017, specific work evaluating arsenic, particulate matter, and ozone was completed. This work can inform the review and assessment of human-health risk of air, water, or soil samples collected during investigations and remediation, as well as aid in communicating health risk to the public.

Finally, toxicologists communicate risk and toxicology with the public, state and federal legislators and their committees, the EPA, other government agencies, the press, and judges during legal proceedings. This often includes input on EPA rulemaking, including the NAAQS, through written comments, meetings, and scientific publications.

Air Pollutant Watch List

The TCEQ oversees the Air Pollutant Watch List activities that result when ambient pollutant concentrations exceed these protective levels. The TCEQ routinely reviews and conducts health-effects evaluations of ambient air monitoring data from across the state by comparing air-toxic concentrations to their respective AMCVs or state standards. The TCEQ evaluates areas for inclusion on the Air Pollutant Watch List where monitored concentrations of air toxics are persistently measured above AMCVs or state standards.

The purpose of the watch list is to reduce air-toxic concentrations below levels of concern by focusing TCEQ resources and heightening awareness for interested parties in areas of concern.

The TCEQ also uses the watch list to identify companies with the potential of contributing to elevated ambient air-toxic concentrations and to then develop strategic actions to reduce emissions. An area's inclusion on the watch list results in more stringent permitting, priority in investigations, and in some cases increased monitoring.

Eight areas of the state are currently on the watch list published online at <www.tceq.texas.gov/toxicology/apwl>.

In fiscal 2016, the TCEQ delisted two watch list areas (Dallas and Texas City) and expects to delist another in September 2016 (Beaumont). The TCEQ is also evaluating an additional area (Galena Park) to determine whether the improvements in air quality are expected to be maintained. No new areas have been added to the watch list since 2007.

Oil and Gas: Boom of Shale Plays

The TCEQ continues to collect monitoring data from oil and gas production areas, including the Barnett Shale and Eagle Ford Shale.

The TCEQ conducts in-depth measurements at shale formations to evaluate the potential effects. The TCEQ continues to conduct surveys and investigations at oil and gas sites using optical gas imaging camera (OGIC) technology and other monitoring instruments.

The monitoring, on-site investigations, and enforcement activities in the shale areas also complement increased air-permitting activities. However, with the downturn in the price of oil and natural gas, air permitting for oil and gas sites has slowed to some degree. The additional field activities include additional stationary monitors, increased collections of ambient air canister samples, flyovers using OGIC imaging, targeted mobile monitoring, and investigations (routine and complaint-driven).

One vital aspect in responding to shale-play activities is the need for abundant and timely communications with all interested parties. The TCEQ has relied on community open houses, meetings with county judges and other elected officials, workshops for local governments and industry, town-hall meetings, legislative briefings, and guidance documents. The agency also maintains a multimedia website (see <www.TexasOilandGasHelp.org>) with links to rules, monitoring data, environmental complaint procedures, and regulatory guidance.

A shale play is a defined geographic area containing an organic-rich, fine-grained sedimentary rock with specific characteristics. The shale forms from the compaction of silt and clay-size mineral particles commonly called "mud."

The TCEQ continues to evaluate its statewide network for air quality monitoring and, when needed, will expand those operations. Fifteen automatic-gas-chromatograph monitors operate in the Barnett Shale area, along with numerous other instruments that monitor for criteria pollutants. In addition, 16 VOC canister samplers (taking samples every sixth day) are located throughout TCEQ Region 3 (Abilene) and Region 4 (Dallas–Fort Worth).

In South Texas, the agency has established a precursor ozone monitoring station in Floresville (Wilson County), which is north of the Eagle Ford Shale, that began operating on July 18, 2013. A monitoring station has also been established in Karnes City, which is located in Karnes County, and was activated on Dec. 17, 2014. Karnes County continues to lead the Eagle Ford Shale play in production and drilling activities. The data from these new monitoring stations is used to help determine whether the shale oil and gas play is contributing to ozone formation in the San Antonio area. It should be noted that existing statewide monitors located within oil and gas plays show no indications that these emissions are of sufficient concentration or duration to be harmful to residents.

Regional Haze

Guadalupe Mountains and Big Bend national parks are Class I areas of Texas identified by the federal government for visibility protection, along with 154 other national parks and wilderness areas throughout the country. Regional Haze is a long-term air quality program requiring states to establish goals and strategies to reduce visibility-decreasing pollutants in the Class I areas and meet a "natural conditions" visibility goal by 2064. In Texas, the pollutants influencing visibility are primarily NO_X, SO_2, and PM. Regional Haze program requirements include updated plans due to the EPA every 10 years and progress reports due to the EPA every five years in between plan updates, to demonstrate progress toward natural conditions.

The Texas Regional Haze SIP revision was submitted to the EPA on March 19, 2009. The plan projected that Texas Class I areas will not meet the 2064 "natural conditions" goal due to emissions from the eastern United States and international sources. On Jan. 5, 2016, the EPA finalized a partial disapproval of the 2009 SIP revision and issued a federal implementation plan effective Feb. 4, 2016. Texas filed a legal challenge to the EPA's action in the U.S. Court of Appeals for the 5th Circuit on Feb. 29, 2016. On July 15, 2016, the 5th Circuit stayed the EPA's FIP pending the resolution of the lawsuit. The FIP requires emissions control upgrades or emissions limits at eight coal-fired power plants in Texas. The EPA also approved the Texas Best Available Retrofit Technology (BART) rule with regard to non-electric utility generating units, but due to continuing issues with the Cross-State Air Pollution Rule, the EPA could not take action on BART requirements for electric utility generating units (EGUs). The EPA has recently initiated action to develop a FIP to address BART for 28 Texas EGUs. Per a consent decree with environmental groups, the proposed BART FIP is scheduled for December 2016 with final rulemaking scheduled for 2017.

The first five-year progress report on regional haze was submitted to the EPA in March 2014. It contained:

- a summary of emissions reductions achieved from the plan
- an assessment of visibility conditions and changes for each Class I area in Texas that Texas may have an impact on
- an analysis of emissions reductions by pollutant
- a review of Texas' visibility monitoring strategy and any necessary modifications

On April 25, 2016, the EPA proposed a new rule to update aspects of the Regional Haze program. The proposed rule would:

- strengthen requirements for consultation with federal land managers
- extend Reasonably Attributable Visibility Impairment requirements to all states to address situations where a single source or small number of sources affect visibility in a Class I area
- extend the SIP submission deadline for the second planning period from July 31, 2018 to July 31, 2021
- adjust the submission deadline so that second progress reports would be due by Jan. 31, 2025
- remove the requirement for progress reports to be SIP revisions

It is anticipated that the rule will be final in late 2016.

Clean Power Plan

On Oct. 23, 2015, the EPA published final Clean Power Plan rules and proposed federal plan and model rules. The CPP establishes emission guidelines for carbon dioxide (CO_2) under federal Clean Air Act Section 111(d). The CPP applies to existing fossil fuel-fired EGUs that commenced construction on or before Jan. 8, 2014. Section 111(d) requires each state to develop "standards of performance" for existing stationary sources and a plan to achieve those standards. *Standard of performance* is defined as "the degree of emission limitation achievable through the application of the best system of emission reduction (taking into account the cost of achieving such reduction)." The EPA's final plan relies on three building blocks:

1. *heat-rate improvement:* efficiency improvements on coal-fired units
2. *redispatch to existing natural gas combined-cycle plants:* shifting generation from coal-fired and other higher CO_2 emitting units to these plants
3. *renewable energy:* expand low- or zero-carbon energy generation.

States can either adopt the unit-type specific standards of performance that the EPA established in the final CPP rule, or the states can assign different standards on an individual unit basis provided the state plan shows compliance with the EPA-assigned statewide CO_2 standards. Under the second option, the state can either meet a statewide rate-based standard in pounds of CO_2 per megawatt-hour or a statewide mass-based standard in total tons of CO_2.

On Feb. 9, 2016, the U.S. Supreme Court issued a stay of the CPP final rule, until all appeals to the court are finished. This stays all deadlines of the rule, such as the state submission dates (Sept. 6, 2016 and Sept. 6, 2018), the initial compliance date of Jan. 1, 2022, and the final compliance date of Jan. 1, 2030. On Sept. 27, 2016, the D.C. Circuit Court heard oral arguments.

Major Incentive Programs

The TCEQ implements several incentive programs aimed at reducing emissions, including the Texas Emissions Reduction Plan, the Texas Clean School Bus Program, and Drive a Clean Machine.

Texas Emissions Reduction Plan

The TERP gives financial incentives to owners and operators of heavy-duty vehicles and equipment for projects that will lower nitrogen oxides (NO_X) emissions. Because NO_X is a leading contributor to the formation of ground-level ozone, reducing these emissions is key to achieving compliance with the federal ozone standard. Recently added incentive programs also support the increase in the use of alternative fuels for transportation in Texas.

- The **Diesel Emissions Reduction Incentive Program** has been the core incentive program since the TERP was established in 2001. DERI incentives have focused largely on the ozone nonattainment areas of Dallas–Fort Worth and Houston-Galveston-Brazoria. Funding has also been awarded to projects in the Tyler-Longview-Marshall, San Antonio, Beaumont–Port Arthur, Austin, Corpus Christi, El Paso, and Victoria areas. From 2001 through August 2016, the DERI program awarded more than $1 billion for the upgrade or replacement of 17,629 heavy-duty

vehicles, locomotives, marine vessels, and pieces of equipment. Over the life of these projects, 171,945 tons of NO_X are projected to be reduced, which in 2016 equated to 43.29 tons per day.

- The **Texas Clean Fleet Program** funds replacement of diesel vehicles with alternative-fuel or hybrid vehicles. From 2010 through August 2016, 20 grants funded 472 replacement vehicles for a total of $38.8 million. These projects included a range of alternative-fuel vehicles, including propane school buses, natural gas garbage trucks, hybrid delivery vehicles and garbage trucks, and electric vehicles. These projects are projected to reduce NO_X by about 498 tons over the life of the projects.
- The **Clean Transportation Triangle Program** (CTTP) provides grants to support the development of a network of natural gas vehicle-fueling stations. The program was originally aimed at fueling stations along the interstate highways connecting the Houston, Dallas, Fort Worth, and San Antonio areas. The eligible areas were expanded by the Legislature in 2013 to include counties within the triangle formed by those interstate highways, as well as other areas also eligible under the DERI Program. From 2012 through August 2016, the CTTP funded 34 grants for a total of $11.6 million.
- The **Texas Natural Gas Vehicle Grants Program** provides grants for the replacement or repower of heavy- or medium-duty diesel- or gasoline-powered vehicles with natural gas–powered vehicles and engines. Eligible vehicles must be operated in the counties designated under the CTTP. From 2012 through August 2016, the program funded 103 grants to replace 963 vehicles for a total of $44 million. These projects are projected to reduce more than 1,572 tons of NO_X over the life of the projects. The program is accepting applications first come, first served through May 2017.
- The **Alternative Fueling Facilities Program** provides grants for the construction, reconstruction, or acquisition of facilities to store, compress, or dispense alternative fuels in areas of Texas designated as "nonattainment." From 2012 through August 2016, the program funded 69 grants for a total of $12.8 million.
- The primary objective of the **New Technology Implementation Grant Program** is to offset the incremental cost of the implementation of existing technologies that reduce the emission of pollutants from facilities and other stationary sources that may also include energy-storage projects in Texas. From 2010 through August 2016, the program funded six grants for a total of $9.75 million.
- The **Drayage Truck Incentive Program** was established by the Legislature in 2013 to fund the replacement of drayage trucks operating at seaports and railyards in Texas nonattainment areas with newer, less-polluting drayage trucks. Through August 2016, the program funded nine grants for the replacement of 47 vehicles, for a total of $3.9 million.

In addition, the TERP program implemented a short-term program established by the Legislature in 2013 that ended in fiscal 2015:

- The **Light-Duty Purchase or Lease Incentive Program** provided up to $2,500 for the purchase of a light-duty vehicle operating on natural gas, liquefied petroleum gas, or plug-in electric drive. Through August 2015, the program provided incentives for the purchase of 1,896 electric plug-in vehicles and 196 vehicles operating on compressed natural gas or propane, for a total $4.65 million. The program expired in August 2015.

Texas Clean School Bus Program

The Texas Clean School Bus Program provides grants for technologies that reduce diesel-exhaust emissions inside the cabin of a school bus. The program also offers educational materials to school districts on other ways to reduce emissions, such as idling reduction. From 2008 to August 2016, the Texas Clean School Bus Program used state and federal funds to reimburse approximately $33 million in 227 grants to retrofit about 7,497 school buses in Texas.

TERP grants and activities are further detailed in a separate report, *TERP Biennial Report 2015-2016* (TCEQ publication SFR-079/16).

Drive a Clean Machine

The Drive a Clean Machine program (see www.driveacleanmachine.org) was established in 2007 as part of the Low Income Vehicle Repair Assistance, Retrofit, and Accelerated Vehicle Retirement Program (LIRAP) to repair or remove older, higher emitting vehicles. The Drive a Clean Machine program is available to qualifying vehicle owners in participating counties in the areas of Houston-Galveston-Brazoria, Dallas–Fort Worth, and Austin–Round Rock.

The counties in these areas conduct annual inspections of vehicle emissions. From the program's debut in December 2007 through August 2016, qualifying vehicle owners have received more than $194 million. This funding helped replace 57,474 vehicles and repair 40,895 vehicles.

Local Initiative Projects

The Local Initiative Projects (LIP) program was established in 2007 to provide funding to counties participating in the LIRAP for implementation of air quality improvement strategies through local projects and initiatives. Projects are matched dollar-for-dollar by the local government, although the TCEQ may reduce the match for counties implementing programs to detect vehicle-emissions fraud (currently set at 25¢/dollar). From the LIP program's debut in December 2007, more than $31 million has been appropriated to fund eligible projects in the participating counties. Recently funded projects include vehicle-emissions enforcement task forces; traffic-signal synchronization, networking, and management systems; and bus transit services.

Environmental Research and Development

The TCEQ supports cutting-edge scientific research to expand knowledge about air quality in Texas. The agency's Air Quality Research Program (AQRP) continues to be engaged in a range of projects, which built upon scientific research on air quality from the previous biennium.

The AQRP was a major participant in the field study called DISCOVER-AQ (Deriving Information on Surface Conditions from Column and Vertically Resolved Observations Relevant to Air Quality). During the summer of 2013, NASA aircraft conducted a series of flights over Texas. The aircraft carried cutting-edge scientific instruments and collected over 50 hours of measurements of gaseous and particulate pollution, primarily in the Houston area.

As part of this major study designed to gain a better understanding of the factors that control air quality in Texas, additional ground-based air quality measurements were made simultaneously by researchers from collaborating organizations. This expansive data set and information collected during the study have been undergoing in-depth analysis, including extensive photochemical-modeling exercises during the past biennium. Many of the key findings include new insights into the complexities of air quality in the Houston area.

Other important air quality research carried out through the AQRP has included:

- a series of projects designed to better characterize biogenic emissions including investigating impacts of drought conditions on ozone formation in Texas, improving land cover and emissions factors for biogenic isoprene for Texas air quality simulations, and incorporating space-borne observations
- targeted improvements in the global fire emissions model used to simulate the role of fires in air quality
- an assessment of remote sensing technologies to evaluate flare performance
- a comprehensive report that summarizes the current state of scientific understanding of air quality in Texas based on findings from research projects carried out in 2010 through 2015
- improved characterizations of boundary layer meteorology using radar wind profiler and balloon sounding measurements
- an update and evaluation of the model algorithms needed to better predict formation of particulate matter from the isoprene emissions prevalent in eastern Texas and Louisiana
- a study of the Bermuda High, a key driver of large-scale circulation patterns in southeastern Texas in summer, and its link to surface ozone in the Houston region

In addition to research carried out through the AQRP, the TCEQ used grants and contracts to support ongoing air quality research. Some notable projects have included:

- numerous projects using state-of-the science technology to assess and address emissions from oil and gas activities, including aerial surveys or flyovers using a helicopter with an infrared VOC camera as a screening tool and a study to estimate emissions of ozone precursors from mobile sources associated with activities at Eagle Ford
- continued sampling and analysis of particulate-matter chemical speciation, which is used to support documentation of exceptional impact at the Clinton Drive monitor in Houston and to quantify the contributions of African dust and smoke from southern Mexico and Central America
- continued analysis of biomass burning and the impact on ozone in Texas, and research-grade photochemical modeling to support exceptional-event technical demonstrations

- several projects designed to enhance the tools Texas uses to improve emissions inventories that reflect activities and sources in the state
- a series of projects designed to improve the technical mechanics of the photochemical model to enhance overall model performance
- investigations of tools for ozone-forecast modeling

The latest findings from these research projects help the state understand and appropriately address some of the challenging air quality issues faced by Texans as a result of changes to various standards for ambient air quality and other federal actions. These challenges are increasing, and addressing them will require continued emphasis on scientific understanding. This knowledge helps ensure that Texas adopts attainment strategies that are achievable, sound, and based on the most current science.

Water Quality

Developing Surface Water Quality Standards

Texas Surface Water Quality Standards

Under the federal Clean Water Act, every three years the TCEQ is required to review and, if appropriate, revise the Texas Surface Water Quality Standards. These standards are the basis for establishing discharge limits in wastewater permits, setting instream water quality goals for total maximum daily loads and setting forth criteria to assess instream attainment of water quality.

Water quality standards are set for major streams and rivers, reservoirs, and estuaries based on their specific uses: aquatic life, recreation, drinking water, fish consumption, and general. The standards establish water quality criteria for temperature, pH, dissolved oxygen, salts, bacterial indicators for recreational suitability, and a number of toxic substances.

The commission revised its water quality standards in fiscal 2014. Major revisions included:

- Addition of industrial cooling areas and revisions to mixing-zone provisions to aid implementation of thermal water quality standards in wastewater permitting.
- Revisions to toxicity criteria to incorporate new data on toxicity effects and local water quality characteristics that affect toxicity.
- Numerous revisions and additions to the uses and criteria of individual water bodies to incorporate new data and the results of recent use-attainability analyses.

The revised standards must be approved by the EPA before being applied to activities related to the Clean Water Act. Although federal review of portions of the 2010 and the 2014 standards has yet to be completed, the TCEQ is proceeding with its 2017 triennial standards review. Two work-group meetings were held in the spring of 2016 to discuss potential revisions to the standards.

Use-Attainability Analyses

The Surface Water Quality Standards Program also coordinates and conducts use-attainability analyses to develop site-specific uses for aquatic life and recreation. The UAA assessment is often used to re-evaluate designated or presumed uses when the existing standards may need to be revised for a water body. As a result of aquatic life UAAs, site-specific aquatic-life uses and dissolved-oxygen criteria are proposed in the 2017 revision of the standards for individual water bodies.

A use-attainability analysis (UAA) is a scientific assessment of the physical, chemical, biological, or recreational characteristics of a water body.

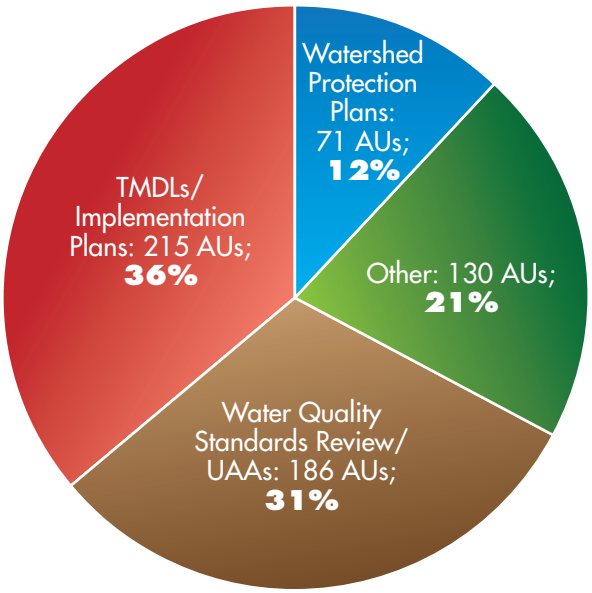
In 2009, the TCEQ developed recreational UAA procedures to evaluate and more accurately assign levels of protection for water recreational activities such as swimming and fishing. Since then, the agency has initiated more than 120 UAAs to evaluate recreational uses of water bodies that have not attained their existing criteria. Using results from recreational UAAs, the TCEQ is proposing site-specific contact recreation criteria for numerous individual water bodies in the 2017 Texas Surface Water Quality Standards revision.

Clean Rivers Program

The Clean Rivers Program administers and implements a statewide framework set out in Texas Water Code Section

Management Strategies for Restoring Water Quality

An assessment unit (AU) is the smallest geographic area used when evaluating surface water quality.



Total AUs with an assigned restoration strategy: 909

The TCEQ can address water quality impairments in a variety of ways. Selection of an appropriate restoration strategy is coordinated with stakeholders through watershed action planning.

Source: 2012 Texas Integrated Report

26.0135. This state program works with 15 regional partners (river authorities and others) to collect water quality samples, derive quality-assured data, evaluate water quality issues, and provide a public forum for prioritizing water quality issues in each Texas river basin. This program provides 60 to 70 percent of the data available in the state's surface water quality database used for water-resource decisions including revising water quality criteria, identifying the status of water quality, and supporting the development of projects to improve water quality.

Water Quality Monitoring

Surface water quality is monitored across the state in relation to human-health concerns, ecological conditions, and designated uses. The resulting data form a basis for policies that promote the protection and restoration of surface water in Texas.

Coordinated Routine Monitoring

Each spring, TCEQ staff meets with various water quality organizations to coordinate their monitoring efforts for the upcoming fiscal year. The TCEQ prepares the guidance and reference materials, and the Texas Clean Rivers Program partners coordinate the local meetings. The available information is used by participants to select stations and parameters that will enhance the overall coverage of water quality monitoring, eliminate duplication of effort, and address basin priorities.

The coordinated monitoring network, which is made up of about 1,800 active stations, is one of the most extensive in the country. Coordinating the monitoring among the various participants ensures that available resources are used as efficiently as possible.

Continuous Water Quality Monitoring

The TCEQ has developed—and continues to refine—a network of continuous water quality monitoring sites on priority water bodies. The agency maintains 40 to 50 sites in its Continuous Water Quality Monitoring Network (CWQMN). At these sites, instruments measure basic water quality conditions every 15 minutes.

CWQMN monitoring data may be used by the TCEQ or other organizations to make decisions about water-resource management, target field investigations, evaluate the effectiveness of water quality management programs such as TMDL implementation plans and watershed-protection plans, characterize existing conditions, and evaluate spatial and temporal trends. The data are posted at <www.texaswaterdata.org>.

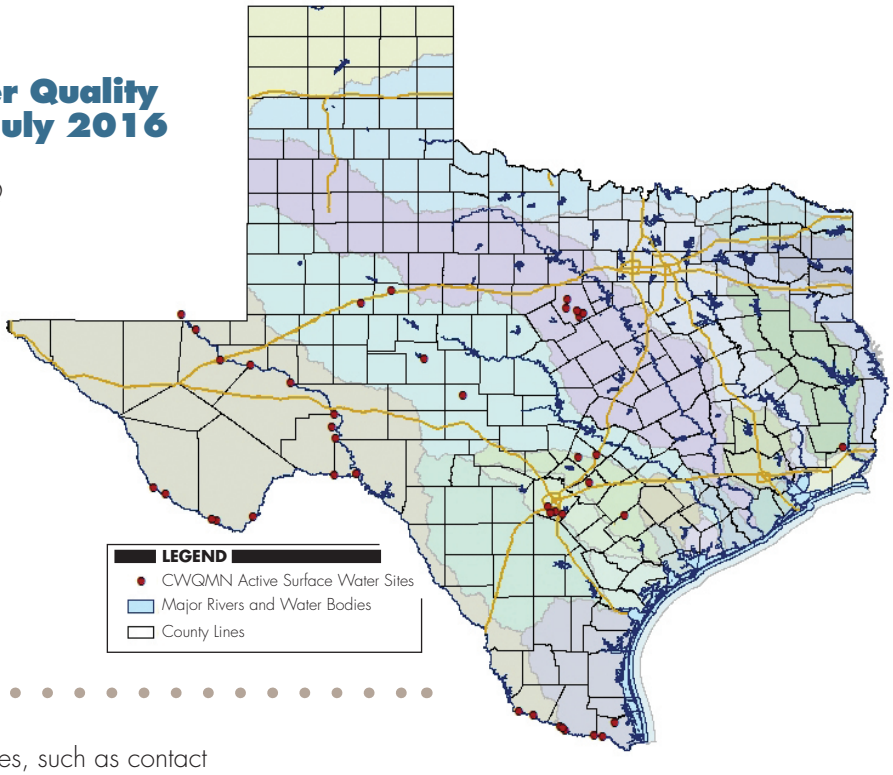
The CWQMN is used to guide decisions on how to better protect certain segments of rivers or lakes. For example, from 2004 to 2014 the TCEQ developed a network of 14 CWQMN sites on the Rio Grande and the Pecos River, primarily to monitor levels of dissolved salts to protect the water supply in the Amistad Reservoir. The Pecos River CWQMN stations also supply information on the effectiveness of the Pecos River Watershed Protection Plan. These stations are operated and maintained by the U.S. Geological Survey through cooperative agreements with the TCEQ and the Texas State Soil and Water Conservation Board. Another use of such data is development of water quality models.

Assessing Surface Water Data

Every even-numbered year, the TCEQ assesses water quality to determine which water bodies meet the surface water

TCEQ Continuous Water Quality Monitoring Stations – July 2016

In the summer of 2016, the TCEQ had 43 active stations around the state as part of the Continuous Water Quality Monitoring Network. Instruments at these sites measure basic water quality conditions every 15 minutes. The data are used to make decisions about managing water resources and water quality. The number and locations of sites may vary from year to year.



quality standards for their designated uses, such as contact recreation, support of aquatic life, or drinking-water supply. Data associated with 200 different water quality parameters are reviewed to conduct the assessment. These parameters include physical and chemical constituents, as well as measures of biological integrity.

The assessment is published on the TCEQ website and submitted as a draft to the EPA as the *Texas Integrated Report for Clean Water Act Sections 305(b) and 303(d)* (found at <www.tceq.texas.gov/goto/2014-intrep>).

The report evaluates conditions during the assessment period and identifies the status of the state's surface waters in relation to the Texas Surface Water Quality Standards. Waters that do not regularly attain one or more of the standards may require action by the TCEQ and are placed on the 303(d) List of Impaired Water Bodies for Texas (part of the *Integrated Report*). The EPA must approve this list before its implementation by the TCEQ's water quality management programs.

Because of its large number of river miles, Texas can monitor only a portion of its surface water bodies. The major river segments and those considered at highest risk for pollution are monitored and assessed regularly. The 2014 Integrated Report was approved by the EPA in November 2015. In developing the report, water quality data was evaluated from 5,086 sites on 1,409 water bodies. The draft 2016 Integrated Report is currently under development.

Restoring Water Quality

Watershed Action Planning

Water quality planning programs in Texas have responded to the challenges of maintaining and improving water quality by developing new approaches to addressing water quality issues in the state. Watershed action planning is a process for coordinating, documenting, and tracking the actions necessary to protect and improve the quality of the state's streams, lakes, and estuaries. The major objectives are:

- To fully engage stakeholders in determining the most appropriate action to protect or restore water quality.
- To improve access to state agencies' decisions about water quality management and increase the transparency of that decision making.
- To improve the accountability of state agencies responsible for protecting and improving water quality.

Leading the watershed action planning process are the TCEQ, the Texas State Soil and Water Conservation Board, and the Texas Clean Rivers Program. Involving stakeholders, especially at the watershed level, is key to the success of the watershed action planning process.

Total Maximum Daily Load Program

The Total Maximum Daily Load Program is one of the agency's mechanisms for improving the quality of impaired

surface waters. A TMDL is the total amount (or load) of a single pollutant that a receiving water body can assimilate within a 24-hour period and maintain water quality standards. A rigorous scientific process is used to arrive at practicable targets for the pollutant reductions in TMDLs.

This program works with the agency's water quality programs, other governmental agencies, and watershed stakeholders during the development of TMDLs and related implementation plans.

Bacteria TMDLs

Bacteria from human and animal wastes can indicate the presence of disease-causing microorganisms that pose a threat to public health. People who swim or wade in waterways with high concentrations of bacteria have an increased risk of contracting gastrointestinal illnesses. High bacteria concentrations can also affect the safety of oyster harvesting and consumption.

Of the 589 impairments listed in the 2014 Integrated Report for surface water segments in Texas, about half are for bacterial impairments to recreational water uses.

The TMDL Program has developed an effective strategy for developing TMDLs that protects recreational safety. The strategy, which relies on the engagement and consensus of the communities in the affected watersheds, has been initiated for 46 water bodies in seven different watersheds. Other actions are also taken to address bacteria impairments, such as recreational use-attainability analyses that ensure that the appropriate contact-recreation use is in place, as well as watershed-protection plans developed by stakeholders and primarily directed at nonpoint sources.

Implementation Plans

While a TMDL analysis is being completed, stakeholders are engaged in the development of an Implementation Plan, which identifies the steps necessary to improve water quality. These I-Plans outline three to five years of activities, indicating who will carry them out, when they will be done, and how improvement will be gauged. The time frames for completing I-Plans are affected by stakeholder resources and when stakeholders reach consensus. Each plan contains a commitment by the stakeholders to meet periodically to review progress. The plan is revised to maintain sustainability and to adjust to changing conditions.

Programmatic and Environmental Success

Since 1998, the TCEQ has been developing TMDLs to improve the quality of impaired water bodies on the federal 303(d) List, which identifies surface waters that do not meet one or more quality standards. In all, the agency has adopted 256 TMDLs for 179 water bodies in the state.

Based on a comparison of the 2012 and the 2014 Integrated Reports, water quality standards were attained for five impaired assessment units addressed by the TMDL Program.

From August 2014 to August 2016, the commission adopted TMDLs to address instances where bacteria had impaired the contact-recreation use. TMDLs were adopted for 24 surface water body segments consisting of 31 assessment units. A TMDL is developed for each assessment unit: Whiteoak Bayou (one), Armand Bayou (six), City of Austin watersheds (five), the Mission and Aransas Rivers (two), Upper San Antonio River (seven), Dickinson Bayou (three) and the East and West Forks of the San Jacinto River (seven). During that time, the commission also approved five I-Plans, for the city of Austin watersheds, Adams and Cow Bayous, the Upper Gulf Coast, the Upper San Antonio River, and the Mission and Aransas Rivers.

The Greater Trinity River Bacteria TMDL Implementation Plan is an example of successful community engagement to address bacteria impairments. Development of the I-Plan occurred through a stakeholder-driven process that included active public participation. Stakeholders engaged in the process represented a broad spectrum of authorities and interests including government, agriculture, business, conservation groups, and the public. The I-Plan identifies eight strategies for activities that address three TMDL projects.

Nonpoint Source Program

The Nonpoint Source Program administers the provisions of Section 319 of the federal Clean Water Act. Section 319 authorizes grant funding for states to develop projects and implement NPS management strategies to maintain and improve water quality conditions.

The TCEQ, in coordination with the Texas State Soil and Water Conservation Board (TSSWCB), manages NPS grants to implement the long and short-term goals identified in the Texas NPS Management Program. The NPS Program annual report documents progress in meeting the long- and short-term goals of the management program.

The NPS grant from the EPA is split between the TCEQ (to address urban and non-agricultural NPS pollution) and the TSSWCB to address agricultural and silvicultural NPS pollution. The TCEQ receives $3 to $4 million annually. About 60 percent of overall project costs are federally reimbursable; the remaining 40 percent comes from state

or local match. In fiscal 2016, $3.7 million was matched with $2.5 million, for a total of $6.2 million.

The TCEQ solicits applications to develop projects that contribute to the NPS Program management plan. Typically, 10 to 20 applications are received, reviewed, and ranked each year. Because the number of projects funded depends on the amount of each contract, the number fluctuates. Seven projects were selected in fiscal 2015, and 13 in fiscal 2016. Half of the federal funds awarded must be used to implement watershed-based plans, comprising activities that include public outreach and education, low-impact development, construction and implementation of best management practices and inspection and replacement of on-site septic systems.

The NPS Program also administers provisions of Section 604(b) of the federal Clean Water Act. These funds are derived from State Revolving Fund appropriations under Title VI of the act. Using a legislatively mandated formula, money is passed through to councils of governments for water quality planning. In fiscal 2015, the program received $647,000 in funding from the EPA and, in fiscal 2016, $644,000.

Bay and Estuary Programs

The estuary programs are non-regulatory, community-based programs focused on conserving the sustainable use of bays and estuaries in the Houston-Galveston and Coastal Bend bays regions through implementation of locally developed comprehensive conservation management plans. Plans for Galveston Bay and the Coastal Bend bays were established in the 1990s by a broad-based group of stakeholders and bay user groups. These plans strive to balance the economic and human needs of the regions.

The plans are implemented by two different organizations: the Galveston Bay Estuary Program, which is a program of the TCEQ, and the Coastal Bend Bays and Estuaries Program, which is managed by a nonprofit authority established for that purpose. The TCEQ partially funds the CBBEP.

Additional coastal activities at the TCEQ include:

- Participating in the Gulf of Mexico Alliance, a partnership linking Alabama, Florida, Louisiana, Mississippi, and Texas. The TCEQ contributes staff time to implement the Governors' Action Plan, focusing on water resources and improved comparability of data collection among the states.
- Serving on the Coastal Coordination Advisory Committee and participating in the implementation of the state's Coastal Management Program to improve the management of coastal natural resource areas and to ensure long-term ecological and economic productivity of the coast.
- Directing, along with the General Land Office and the Railroad Commission of Texas, the allocation of funds from the Coastal Impact Assistance Program.
- Working with the General Land Office to gain full approval of the Coastal Nonpoint Source Program, which is required under the Coastal Zone Act Reauthorization Amendments.

Galveston Bay Estuary Program

The GBEP provides ecosystem-based management that strives to balance economic and human needs with available natural resources in Galveston Bay and its watershed. Toward this goal, the program fosters cross-jurisdictional coordination among federal, state, and local agencies and groups, and cultivates diverse, public-private partnerships to implement projects and build public stewardship.

GBEP priorities include:

- coastal habitat conservation
- public awareness and stewardship
- water conservation
- stormwater quality improvement
- monitoring and research

During fiscal 2015 and 2016, the GBEP worked to preserve wetlands and important coastal habitats that will protect the long-term health and productivity of Galveston Bay. To inform resource managers, the program conducted ecosystem-based monitoring and research, and worked with partners to fill data gaps. The GBEP collaborated with local stakeholders to create watershed-protection plans and to implement water quality projects. Its staff hosted the 10th State of the Bay Symposium in January 2016 and also continued to develop the Back to the Bay campaign, which strives to increase public awareness and stakeholder involvement and to reinforce the priorities of the Galveston Bay Plan.

In fiscal 2015 and 2016, about 3,086 acres of coastal wetlands and other important habitats were protected, restored, and enhanced. Since 2000, the GBEP and its partners have protected, restored, and enhanced a total of 27,131 acres of important coastal habitats.

Through collaborative partnerships established by the program, approximately $6.00 in private, local, and federal contributions was levered for every $1 the program dedicated to these projects.

Coastal Bend Bays and Estuaries Program

During fiscal 2015 and 2016, the CBBEP implemented 68 projects, including habitat restoration and protection in areas totaling 14,492 acres. Based in the Corpus Christi area, the CBBEP is a voluntary partnership that works with industry, environmental groups, bay users, local governments, and resource managers to improve the health of the bay system. In addition to receiving program funds from local governments, private industry, the TCEQ, and the EPA, the CBBEP seeks funding from private grants and other governmental agencies. In the last two years, the CBBEP secured more than $9.75 million in additional funds to lever TCEQ funding.

CBBEP priority issues focus on human uses of natural resources, freshwater inflows, maritime commerce, habitat loss, water and sediment quality, and education and outreach. The CBBEP has also become active in water and sediment quality issues. The CBBEP's goal is to address 303(d)-listed segments so they meet state water quality standards.

Other areas of focus:

- conserving and protecting wetlands and wildlife habitat through partnerships with private landowners
- restoring the Nueces River Delta for the benefit of fisheries, wildlife habitat, and freshwater conservation
- environmental education and awareness for more than 8,000 students and teachers annually at the CBBEP Nueces Delta Preserve by delivering educational experiences and learning through discovery, as well as scientific activities
- enhancement of colonial-waterbird rookery islands by implementing predator control, habitat management, and other actions to help stem the declining populations of nesting coastal birds in the Coastal Bend and the Lower Laguna Madre
- supporting the efforts of the San Antonio Bay Partnership to better characterize the San Antonio Bay system and to develop and implement management plans that protect and restore wetlands and wildlife habitats

Drinking Water

Of the 6,715 public water systems in Texas, about 4,640 are community systems, mostly operated by cities. These systems serve about 96 percent of Texans. The rest are non-community systems—such as those at schools, churches, factories, businesses, and state parks.

The TCEQ makes data tools available online so the public can find information on the quality of locally produced drinking water. The Texas Drinking Water Watch <www.tceq.texas.gov/goto/dww> provides analytical results from the compliance sampling of public water systems. In addition, the Source Water Assessment Viewer <www.tceq.texas.gov/gis/swaview> shows the location of the sources of drinking water. The viewer also allows the public to see any potential sources of contamination, such as an underground storage tank.

All public water systems are required to monitor the levels of contaminants present in treated water and to verify that each contaminant does not exceed its maximum contaminant level, action level, or maximum residual disinfection level—the highest level at which a contaminant is considered acceptable in drinking water for the protection of public health.

In all, the EPA has set standards for 102 contaminants in the major categories of microorganisms, disinfection by-products, disinfectants, organic and inorganic chemicals, and radionuclides. The most significant microorganism is coliform bacteria, particularly fecal coliform. The most common chemicals of concern in Texas are disinfection by-products, arsenic, fluoride, and nitrate.

More than 54,000 water samples are analyzed each year just for chemical compliance. Most of the chemical samples are collected by contractors and then submitted to a certified laboratory. The analytical results are sent to the TCEQ and the public water systems.

Each year, the TCEQ holds a free symposium on public drinking water, which typically draws about 800 participants. The agency also provides technical assistance to public water systems to ensure that consumer confidence reports are developed correctly.

Any public system that fails to have its water tested or reports test results incorrectly faces a monitoring or reporting violation. When a public water system has significant or repeated violations of state regulations, the case is referred to the TCEQ's enforcement program.

Violations of Drinking-Water Regulations

	FY2015	FY2016
Enforcement Orders	421	327
Assessed Penalties	$609,716	$363,991
Offsets by SEPs	$3,695	$6,687

Note: The numbers of public water supply orders reflect enforcement actions from all sources in the agency.

The EPA developed the Enforcement Response Policy and the Enforcement Targeting Tool for enforcement targeting under the Safe Drinking Water Act. The TCEQ uses this tool to identify public water systems with the most serious health-based or repeated violations and those that show a history of violations of multiple rules. This strategy brings the systems with the most significant violations to the top of the list for enforcement action, with the goal of returning those systems to compliance as quickly as possible.

More than 96 percent of the state's population is served by public water systems producing water that meets or exceeds the National Primary Drinking Water Standards.

Review of Engineering Plans and Specifications

Public water systems are required to submit engineering plans and specifications for new water systems or for improvements to existing systems. The plans must be reviewed by the TCEQ before construction can begin. In fiscal 2015, TCEQ completed compliance review of 2,085 engineering plans and for public water systems and, in fiscal 2016, 2,038.

The agency strives to ensure that all water and sewer systems have the capability to operate successfully. The TCEQ contracts with the Texas Rural Water Association to assist utilities with financial, managerial, and technical expertise. About 770 assignments for assistance to utilities were made through this contract in fiscal year 2015, as were 590 assignments in fiscal 2016.

The agency reviews the creation of applications for general-law water districts and bond applications for water districts to fund water, sewer, and drainage projects. In fiscal 2015, the agency reviewed 506 water-district applications; in fiscal 2016, 430.

Wastewater Permitting

The Texas Pollutant Discharge Elimination System was delegated to the state in 1998 when the EPA transferred the authority of the National Pollutant Discharge Elimination System for issuing water quality permits in the state to Texas. The TPDES program issues municipal, industrial, and stormwater permits.

Industrial and Municipal Individual Permits

Industrial wastewater permits are issued for the discharge of wastewater generated from industrial activities. In fiscal 2015, the TCEQ issued 138 industrial wastewater permits; in fiscal 2016, 164. Municipal wastewater permits are issued for the discharge of wastewater generated from municipal and domestic activities. In fiscal 2015, the TCEQ issued 659 municipal wastewater permits; in fiscal 2016, 585.

Stormwater Permits

Authorization for stormwater discharges are primarily obtained through one of three types of general permits: industrial, construction, and municipal. The TCEQ receives thousands of applications a year for coverage. To handle the growing workload, the agency has introduced online applications for some of these permitting and reporting functions.

Industry

The multi-sector general permit regulates stormwater discharges from industrial facilities. Facilities authorized under this general permit must develop and implement a stormwater pollution prevention plan, conduct regular monitoring, and use best management practices to reduce the discharge of pollutants in stormwater. The TCEQ receives about 137 notices of intent, no exposure certifications, and notices of termination a month for industrial facilities.

Construction

The construction general permit regulates stormwater runoff associated with construction activities, which include clearing, grading, or excavating land at building projects. Construction disturbing five or more acres is labeled a "large" activity, while construction disturbing one acre or more but less than five acres is termed "small." The TCEQ currently receives about 649 notices of intent and 362 notices of termination a month for large construction activities.

Municipal

The TCEQ also regulates discharges from municipal separate storm-sewer systems (MS_4s). This category applies to a municipality's system of ditches, curbs, gutters, and storm sewers that collect runoff, including controls for drainage from state roadways. The TCEQ has issued 26 individual MS_4 permits. The remaining MS_4s are authorized by general permit. MS_4s must develop and implement a stormwater management plan.

Stormwater General Permits

	Number Affected (issued)		Applications Received (monthly average)		Applications Received (total)	
	Fiscal 2015	*Fiscal 2016*	*Fiscal 2015*	*Fiscal 2016*	*Fiscal 2015*	*Fiscal 2016*
Industrial (facilities) *	1,187	1,855	102	151	1,223	1,812
Construction (large sites)	7,685	7,783	643	649	7,712	7,783
MS_4s (public entities)	455	98	3	2	34	20

** Includes No-Exposure Certifications (NECs).*

Water Availability

Responding to Drought

In recent years, Texas has experienced historic droughts. The drought of 2011 broke records, with 97 percent of the state in extreme or exceptional drought. By mid-2014, almost 45 percent of the state remained in severe, extreme, or exceptional drought. In comparison, by mid-2016, less than 2 percent of the state experienced abnormally dry conditions.

Agency Response and Assistance

The TCEQ has engaged in proactive steps to respond to extreme drought. It communicates information about drought conditions and permit suspensions to state leaders, legislative officials, county judges, county extension agents, holders of water-right permits, and the media.

This response is coordinated through the TCEQ's Drought Team, a multidisciplinary agency group that began meeting in 2010. The team issues updates on the status of drought conditions and agency responses. Agencies invited to team meetings are partners such as the Texas Department of Emergency Management, Texas Department of Agriculture, and Texas Water Development Board.

In addition, the multi-disciplinary Emergency Drinking Water Task Force was formed by the Texas Division of Emergency Management and facilitated by the TCEQ to respond to drought emergencies at public water systems. Once the TCEQ was notified or became aware that a water system was within 180 days of running out of water, the task force informed the appropriate local and state officials, as well as the local TDEM district coordinator, who in turn notified the county emergency management coordinator, mayor, county judge, and appropriate state legislators. The task force met weekly at the height of the drought, and now—in 2016—meets biweekly, to discuss the systems being tracked and opportunities for outreach and assistance.

The agency continues to monitor a targeted list of public water systems that have a limited or an unknown supply of water remaining. Employees offer those systems financial, managerial, and technical assistance, such as identifying alternative water sources, coordinating emergency drinking-water planning, and finding possible funding for alternative sources of water. The TCEQ also engages in outreach and assistance—specifically targeting public water systems—to help prevent systems from running out of water. The agency contacts public water suppliers to urge implementation of drought contingency plans. TCEQ staff offer assistance to any public water system continuing to experience critical conditions.

From 2011 to the present, the TCEQ has provided technical assistance to more than 100 public water systems by expediting approximately 360 requests for reviews of plans and specifications for drilling additional wells, moving surface water intakes to deeper waters, and finding interconnections with adjacent water systems, without compromising drinking-water quality and capacity of other systems.

In fiscal 2016, 680 public water systems in Texas had activated mandatory water restrictions, while another 415 relied on voluntary measures to cut back on water use. For the complete list, see <www.tceq.texas.gov/goto/pws-restrictions>.

Exploring New Supplies through Alternative Treatment

With Texas' population expected to reach almost 46 million by the year 2060, Texans have had to plan far in advance to sustain their water needs. Because of these challenges, public water systems have begun to use less-conventional sources of water and the TCEQ began reviewing a number of innovative water-supply projects, some of which had not previously been considered. The TCEQ has engineers and scientists with the expertise to

guide public water systems through selecting innovative treatment technologies and receiving approval for those technologies while ensuring that the treated water is safe for human consumption.

One alternative involves not only reclaiming effluent from municipal wastewater-treatment plants for non-potable uses such as irrigation and industry, but also adding additional treatment to remove chemical and microbiological contaminants to prepare the effluent for direct potable reuse.

Another alternative for some communities is to treat saline or brackish groundwater. For this reason, the agency initiated rulemaking to streamline construction approval for public water systems asking to conduct brackish-water desalination. In July 2015, after extensive input from the regulated community and interested stakeholders, the rules for desalination using either reverse-osmosis or nanofiltration membranes became effective. In the past, the use of reverse-osmosis membranes or other desalination techniques required either a site-specific pilot study, a pilot study at a site with similar water quality, or full-scale performance data from a site with similar water quality. The streamlined approach in the new rules allows the use of desalination technologies without an exception request. To further assist communities with decreased water supplies, the TCEQ offers concurrent reviews of designs and models.

In addition, marine desalination has been gaining attention as some communities seek to treat saline water to make it potable. In response, the 84th Texas Legislature passed House Bills 2031 and 4097 in 2015 to expedite permitting related to desalination of both marine seawater from the Gulf of Mexico and seawater from a bay or arm of the gulf. In 2016, the agency initiated a rulemaking to expedite permitting and related processes for such diversion of seawater and the discharge of both treated seawater and waste resulting from desalination, and to address industrial seawater desalination.

Water Rights

Water flowing in Texas creeks, rivers, lakes, and bays is state water. The right to use water may be acquired through appropriation via permitting as established in state law. The TCEQ reviews permit applications for new water for administrative and technical requirements related to conservation, water availability, and the environment. In fiscal 2015 and 2016, the agency processed 1,722 water-rights actions, including new permits and amendments, water-supply contracts, and transfers of ownership.

Because of limited water availability, some cities, governments, businesses, and individuals have begun turning to indirect reuse or groundwater as a source of supply. With indirect reuse or groundwater, an authority or individual may discharge effluent or groundwater into a stream, subsequently divert the effluent or groundwater, and use (or reuse) it for irrigation or some other purpose. These types of projects require a bed-and-banks authorization. A total of seven indirect reuse authorizations and amendments and nine bed and banks applications for groundwater conveyance were processed in fiscal years 2015 and 2016.

Since July 2015, the TCEQ has been conducting a critical review of water rights permitting and change of ownership processes that has resulted in changes that include allocating additional personnel authorized by the 84th Texas Legislature for the water-rights permitting program, strongly encouraging pre-application meetings to assist applicants in developing more complete applications, removing redundant internal processes, limiting time extensions granted to applicants to respond to requests for information, and implementing return policies when an applicant is unresponsive. The TCEQ continues to search for more improvements that will expedite permitting without neglecting any statutory responsibilities. The TCEQ is currently working to improve application forms and the instructional material available on its website. In addition, the TCEQ has engaged in outreach efforts to help water right-holders remain in compliance with statutory requirements for reporting water use. Whenever possible, the TCEQ has also reached out to water-rights stakeholders and has increased its presence and availability at water conferences and other events.

Texas Instream Flow Program

The Texas Instream Flow Program, established in 2001, is a collaboration between the TCEQ, the Texas Water Development Board, and the Texas Parks and Wildlife Department. The purpose of the program is to collect and evaluate instream-flow data and to conduct studies to determine instream-flow conditions necessary to support a sound ecological environment.

Instream-flow studies are ongoing in the lower San Antonio, middle and lower Brazos, middle Trinity, and lower Guadalupe river basins. Final recommendations of instream-flow studies of the lower San Antonio and middle and lower Brazos river basins are to be completed by the end of 2016. Data collection efforts are ongoing for the middle Trinity and lower Guadalupe river basins.

Evaluations of River Basins without a Watermaster

Under the Texas Water Code, the TCEQ is required every five years to evaluate river basins that do not have a watermaster program to determine whether a watermaster should be appointed. Agency personnel are directed to report their findings and make recommendations to the commission.

In 2011, the TCEQ developed a schedule for conducting these evaluations, as well as criteria for developing recommendations. The first year of evaluation, conducted in 2012, included the Brazos and Colorado river basins, along with the Brazos-Colorado and Colorado-Lavaca coastal basins. In 2013 the Trinity and San Jacinto river basins were evaluated; in 2014, the Sabine and Neches river basins.

In 2015, evaluations were conducted for the Red and Canadian river basins. For 2016 the fifth evaluation year, the TCEQ evaluated the Cypress Creek and Sulphur River basins. Through this process, the TCEQ received input from stakeholders on whether a new watermaster area was needed. One new area was identified through the petition process for the Brazos River Basin.

For more information, see Appendix D, "Evaluation of Water Basins in Texas without a Watermaster."

Brazos Watermaster

In April 2014, the TCEQ directed that a watermaster be appointed for a portion of the Brazos River Basin, which includes Possum Kingdom Lake and below. This directive was in response to a petition by 35 water-right holders in the basin.

The Brazos watermaster area contains over 900 water rights that authorize over 3 million acre-feet of water and 26 major reservoirs. Water is diverted in the Brazos watermaster area for many purposes, including municipal, industrial, agricultural, and mining use. Since June 2015, the staff has communicated with 79 percent (738) of the water-rights holders, representing approximately 98 percent of the authorized diversions within the watermaster's jurisdiction. Personnel continue to look for methods of reaching the remaining water-rights holders, but challenges include a lack of contact information and current addresses.

Texas Interstate River Compacts

Texas is a party to five interstate river compacts. These compacts apportion the waters of the Canadian, Pecos, Red, and Sabine rivers and the Rio Grande between the appropriate states. Interstate compacts form a legal foundation for the equitable division of the water of an interstate stream with the intent of settling each state's claim to the water.

Rio Grande Compact

The Rio Grande Compact, ratified in 1939, divided the waters of the Rio Grande among the signatory states of Colorado, New Mexico, and Texas from its source in Colorado to Fort Quitman, Texas. The compact did not contain specific wording regarding the apportionment of water in and below Elephant Butte Reservoir. However, the compact was drafted and signed against the backdrop of the 1915 Rio Grande Project and a 1938 U.S. Bureau of Reclamation contract that referred to a division of 57 percent to New Mexico and 43 percent to Texas. The compact contains references and terms to ensure sufficient water to the Rio Grande Project.

The project serves the Las Cruces and El Paso areas and includes Elephant Butte Reservoir, along with canals and diversion works in New Mexico and Texas. The project water was to be allocated by the 57:43 percent division, based on the relative amounts of project acreage

Rio Grande Watershed

originally identified in each state. Two districts receive project water: the Elephant Butte Irrigation District in New Mexico and El Paso County Water Improvement District No. 1 in Texas. The latter supplies the city of El Paso with about half of its water.

In 2008, after 20 years of negotiations, the two districts and the Bureau of Reclamation completed an operating agreement for the Rio Grande Project. The agreement acknowledged the 57:43 percent division of water and established a means of accounting for the allocation. The agreement was a compromise to resolve major issues regarding the impact of large amounts of groundwater development and pumping in New Mexico that affected water deliveries to Texas.

But significant compliance issues continue regarding New Mexico's water use associated with the Rio Grande Compact. In 2011, New Mexico took action in federal district court to invalidate the 2008 operating agreement. In response to the lawsuit and in coordination with the Legislative Budget Board and the Attorney General's Office, the Rio Grande Compact hired outside counsel and technical experts with specialized experience in interstate water litigation to protect Texas' share of water.

In January 2013, Texas filed litigation with the U.S. Supreme Court. A year later, the Supreme Court granted Texas' motion and accepted the case. Subsequently, on March 31, 2014, the Supreme Court granted the United States' motion for intervention.

As Texas develops factual information to support its position, evidence grows that New Mexico's actions have significantly affected, and will continue to affect, water deliveries to Texas. On Nov. 3, 2014, the Supreme Court appointed a special master in this case with authority to fix the time and conditions for the filings of additional pleadings, to direct subsequent proceedings, to summon witnesses, to issue subpoenas, and to take such evidence as may be introduced. The special master was also directed to submit reports to the Supreme Court as he may deem appropriate.

A "special master" is appointed by the Supreme Court to carry out actions on its behalf such as the taking of evidence and making rulings. The Supreme Court can then assess the special master's ruling much as a normal appeals court would, rather than conduct the trial itself. This is necessary as trials in the U.S. almost always involve live testimony and it would be too unwieldy for nine justices to rule on evidentiary objections in real time.

On Dec. 3, 2014, Elephant Butte Irrigation District filed a motion to intervene as a party to these proceedings, and on April 22, 2015, El Paso County Water Improvement District No. 1 filed a motion to intervene.

New Mexico also moved to dismiss Texas' complaint against New Mexico, as well as to dismiss the United States' complaint in intervention.

The special master issued his draft First Report on June 28, 2016, and recommended that

- the court deny New Mexico's motion to dismiss Texas' complaint,
- the court partially grant New Mexico's motion to dismiss the United States' complaint in intervention, and
- the court deny EBID's and EPCWID's motions to intervene.

The special master then invited corrections of facts or misstatements of law in his draft First Report. These corrections were to be submitted to him by Aug. 1, 2016, after which he would decide whether or not to change anything in the report before forwarding a final First Report to the Supreme Court.

As of Aug. 31, 2016, the special master had not forwarded his final First Report to the Supreme Court.

When the Supreme Court receives the final First Report, they will ask for a period of time where the parties can file exceptions, which are appeals to the report. The report then continues through the Court's procedural process where they can choose to affirm the report as is and ignore the exceptions or ask the parties to come and argue their exceptions. In the interim, the Special Master is proceeding forward with the case and planning for the parties to go to trial.

International Treaties

Two international treaties have a major impact on water supplies available to Texas. The 1906 convention between the United States and Mexico apportions the waters of the Rio Grande Basin above Fort Quitman, Texas, while the 1944 treaty between the United States and Mexico apportions the waters of the basin below Fort Quitman.

Mexico continues to under-deliver water to the United States under the 1944 Treaty. Mexico does not treat the United States as a water user and only relies on significant rainfalls to make deliveries of water to north of the border. This stands in contrast to the manner in which the United States treats Mexico in regards to the Colorado River. In fact, the United States has always supplied Mexico its annual allocation from the Colorado River. The Colorado River and the Rio Grande are both covered by the same

1944 water treaty. Efforts continue through the Texas congressional delegation to address this problem.

A related issue concerns the accounting of waters in the Rio Grande at Fort Quitman. While the 1906 convention clearly granted 100 percent of all waters below El Paso to Fort Quitman to the United States, the International Boundary and Water Commission has allocated the waters equally between the United States and Mexico.

Groundwater

The TCEQ is responsible for delineating and designating priority groundwater management areas and creating groundwater-conservation districts in response to landowner petitions or through creating PGMAs.

In 2017, the TCEQ and the Texas Water Development Board will submit a joint legislative report that details activities in fiscal 2015–16 relating to PMGAs and the creation and operation of groundwater-conservation districts.

Groundwater conservation districts, each governed by a locally selected board of directors, are the state's preferred method of groundwater management. Under the Texas Water Code, GCDs are authorized and required to issue permits for water wells, develop a management plan, and adopt rules to implement the plan. The plan and the "desired future conditions" for a groundwater management area must be readopted and approved at least once every five years. The TCEQ actively monitors and ensures GCD compliance to meet requirements for adoption and re-adoption of management plans.

The TCEQ also has responsibility for supporting the activities of the interagency Texas Groundwater Protection Committee. Texas Water Code Sections 26.401–26.408, enacted by the 71st Texas Legislature (1989), established non-degradation of the state's groundwater resources as the goal for all state programs. The same legislation created the TGPC to bridge gaps between existing state groundwater programs and to optimize groundwater quality protection by improving coordination among agencies involved in groundwater activities.

Among the TGPC's mandated activities are:

- developing and updating a comprehensive groundwater protection strategy for the state
- publishing an annual report on groundwater monitoring activities and cases of documented groundwater contamination associated with activities regulated by state agencies
- preparing and publishing a biennial report to the legislature describing these activities, identifying gaps in programs, and recommending actions to address those gaps

Waste Management

Disposal of Low-Level Radioactive Waste

In 2009, the TCEQ issued a license to Waste Control Specialists LLC (WCS) authorizing the operation of a facility for disposal of low-level radioactive waste (LLRW) in Andrews County, Texas.

The LLRW generated in the Texas LLRW Disposal Compact between the states of Texas and Vermont may be disposed of in the Compact Waste Disposal Facility, in addition to accepted non-compact wastes. A separate, adjacent facility, which was authorized by the same license, may accept LLRW and mixed waste (waste that contains both a hazardous and a radioactive constituent) from federal facilities. Upon eventual closure of this site, the facility will be owned by the U.S. Department of Energy.

After the TCEQ authorized commencement of operations at the Compact Waste Disposal Facility portion of the site, the facility received its first waste shipment in April 2012. The TCEQ then authorized operations to begin at the Federal Waste Disposal Facility portion of the site, and the facility received its first waste shipment in June 2013. Since operations began at both sites, more than 300,000 cubic feet of waste had been safely disposed of, and nearly $37 million in disposal and processing fees had been collected as revenue for the state through fiscal 2016.

Texas' LLRW is produced predominantly by nuclear utilities, academic and medical research institutions, hospitals, industry, and the military. LLRW typically consists of radioactively contaminated trash, such as:

- paper
- rags
- plastic
- glassware
- syringes
- protective clothing (gloves, coveralls)
- cardboard
- packaging material

- organic material
- spent pharmaceuticals
- used (decayed), sealed radioactive sources
- residues from water treatment

Nuclear power plants contribute the largest portion of LLRW in the form of contaminated ion-exchange resins and filters, tools, clothing, and irradiated metals and other hardware. LLRW does not include waste from nuclear-weapons manufacturing or from U.S. Navy nuclear propulsion systems.

By law, the TCEQ is responsible for setting rates for the disposal of LLRW at the compact facility. In November 2013, the TCEQ adopted a final disposal rate by rule and published the notice in the *Texas Register*.

Disposal of Radioactive By-Product Material

Licensed in 2008, the WCS site has been open for by-product disposal since 2009. By-product material that can be disposed of by WCS is defined as tailings or wastes produced by, or resulting from, the extraction or concentration of uranium or thorium from ore.

Since 2009, WCS has disposed of one by-product waste stream containing 3,776 canisters of waste generated by the Department of Energy's Fernald facility in Ohio.

Underground Injection Control of Mining Wastes

The TCEQ regulates disposal of by-product material generated at *in situ* uranium mining and processing sites. This occurs through permitting and enforcement of Class I injection wells under the agency's federally authorized Underground Injection Control (UIC) Program.

Uranium mining sites may have a permitted Class I UIC well for disposal of concentrated waste produced from *in situ* mining and uranium recovery, as well as contaminated groundwater recovered during restoration of a site.

At the end of fiscal 2016, Texas had five uranium mining licenses comprising eight sites and two licensed uranium-processing facilities.

Uranium Production

Uranium is produced in Texas through *in situ* leaching. Uranium is leached directly out of a uranium-bearing formation underground and pumped in solution to the surface for processing. The conventional method for uranium production, used in the past, created impoundments for disposal of by-product waste.

Superfund Program

Superfund is the federal program that enables state and federal environmental agencies to address properties contaminated by hazardous substances. The EPA has the legal authority and resources to clean up sites where contamination poses the greatest threat to human health and the environment.

Texas either takes the lead or supports the EPA in the cleanup of Texas sites that are on the National Priorities List, which is the EPA's ranking of national priorities among known releases or threatened releases of hazardous substances, pollutants, or contaminants.

In addition, Texas has a state Superfund program to address sites that are ineligible for the federal program. This program is the state's safety net for addressing contaminated sites. The TCEQ uses state funds for cleanup at sites in the Texas Superfund Registry if no responsible parties can or will perform the cleanup. The TCEQ also takes legal steps to recover the cleanup expenses.

After a site is proposed for the state Superfund program, either the responsible party or the TCEQ proceeds with a remedial investigation, during which the agency determines the nature and extent of the contamination. A feasibility study follows to identify possible cleanup remedies. A local public meeting is held to explain the proposed remedy and to accept public comments. The TCEQ then selects an appropriate remedial action.

In fiscal 2015, Texas had a 112 active sites in the state and federal Superfund programs. Remedial action was completed at two state Superfund sites, one in Bexar County, and the other in Harris County. One state Superfund site in El Paso County was deleted from the Texas Superfund Registry.

In fiscal 2016, one new site in Bexar County was proposed for the National Priorities List, for a total of 110 active sites. Remedial actions were completed at one Texas Superfund Registry site located in Brazoria County which was subsequently deleted from the Texas Superfund Registry. Two additional state Superfund sites became inactive upon their deletion deed notices being filed, one in Nacogdoches County and one in El Paso County.

Petroleum-Storage Tanks

The TCEQ oversees the cleanup of contamination of groundwater and soil due to leaking petroleum-storage tanks. Since the program began in 1987, the agency has received reports of 27,645 leaking PST sites—primarily at gasoline stations.

By the end of fiscal 2016, cleanup had been completed at 26,090 sites, and corrective action was under way at 1,555 sites.

Of the total reported PST releases, about half have affected groundwater.

Leaking PSTs are often discovered when a tank owner or operator upgrades or removes tanks, when an adjacent property owner is affected, or when the tank leak-detection system signals a problem. Some leaks are detected during construction or utility maintenance. Most tank-system leaks are due to corrosion, incorrect installation, or damage during construction or repairs.

To avoid releases, tank owners and operators are required to properly operate and monitor their storage-tank systems, install leak-detection equipment and corrosion protection, and take measures to prevent spills and overfills.

Tank owners and operators are required to clean up releases from leaking PSTs, beginning with a site assessment that may include drilling monitoring wells and taking soil and groundwater samples. The TCEQ oversees the remediation.

Under state law, cleanups of leaking tanks that were discovered and reported after Dec. 23, 1998, are paid by the owners' environmental liability insurance or other financial assurance mechanisms, or from their own funds.

The PST State Lead Program cleans up sites at which the responsible party is unknown, unwilling, or financially unable to do the work—and in situations in which an eligible site was transferred to State Lead by July 2011. State and federal funds pay for the corrective actions. Except for the eligible sites placed in the program by the July 2011 deadline, the state allows cost recovery from the current owner or any previous responsible owner.

Voluntary Cleanups

The Texas Voluntary Cleanup Program gives incentives for pollution cleanup by releasing future property owners from liability once a previously contaminated property is cleaned up to the appropriate risk-based standard.

Since 1995, the program has provided regulatory oversight and guidance for 2,755 applicants and has issued 2,132 certificates of completion.

In the last two years, the program received 147 applications and issued 190 certificates. Recipients of the certificates report that the associated release of liability helps with property sales, including transactions that would not have otherwise occurred due to real or perceived environmental impacts. As a result, many underused or unused properties may be restored to economically beneficial use.

The key benefit of the VCP is the liability release afforded to future property owners once the certificate is issued. The certificate insulates future owners from potential changes in environmental conditions, such as the discovery of previously unknown contamination.

The VCP is funded by an initial $1,000 fee paid by each applicant. Costs beyond the initial fee are invoiced to the applicant monthly by the TCEQ.

Under the Innocent Owner/Operator Program, the TCEQ also implements the law providing liability protection to property owners whose land has been affected by contamination that migrated onto their property from an off-site source. In the last two years, the TCEQ issued 103 certificates.

Dry Cleaners

Since 2003, the TCEQ has been responsible for collecting fees for a remediation fund designed to help pay for the cleanup of contaminated dry-cleaner sites. The fees come from the annual registration of dry-cleaning facilities and drop stations, property owners, prior property owners, and solvent fees from solvent distributors.

The Legislature in 2007 established registration requirements for current and prior property owners who wish to claim benefits from the remediation fund, and authorized a lien against current and prior property owners who fail to pay registration fees due during corrective action.

In addition, the use of perchloroethylene was prohibited at sites where the agency has completed corrective action.

In fiscal 2015, there were 3,075 dry-cleaner registrations and more than $3.3 million in invoiced fees; in fiscal 2016, a total of 2,963 registrations and approximately $3.27 million in invoiced fees.

Managing Industrial and Hazardous Waste

The Resource Conservation Recovery Act establishes a system for controlling hazardous waste from the time it is generated until its ultimate disposal. The EPA has delegated the primary responsibility of implementing the RCRA in Texas to the TCEQ.

The TCEQ reviews and approves plans, evaluates complex analytical data, and writes new and modified Industrial and Hazardous Waste permits. Texas has 179 permitted I&HW treatment, storage, and disposal facilities.

During fiscal 2015 and 2016, the TCEQ issued 30 I&HW permit renewals, performed approximately 1,150 industrial waste stream audits, and oversaw remediation of a total of 310 sites.

Managing Municipal Solid Waste

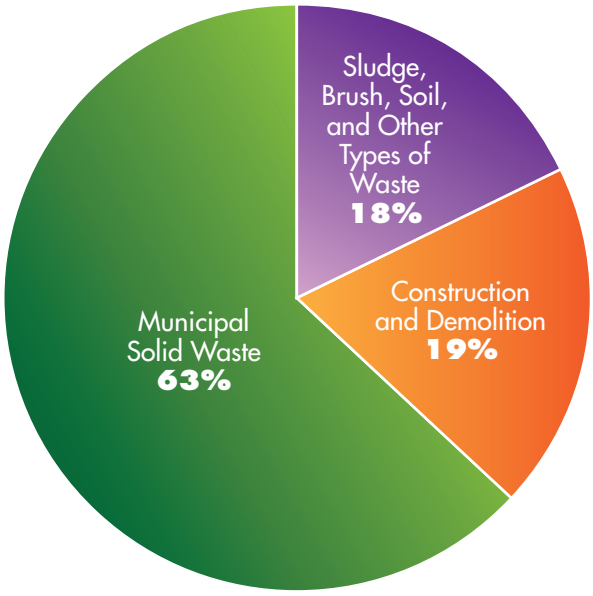
With growing demands on the state's waste-disposal facilities, the TCEQ evaluates the statewide outlook for landfill capacity and strives to reduce the overall amount of waste generated.

In fiscal 2015 (the most recent data available), there were 199 active municipal solid waste landfills in the state. Over 33.4 million tons of waste were disposed of, an increase of 9.4 percent from fiscal 2013. In fiscal 2015, the average per capita disposal rate was 6.7 pounds per person per day.

At the end of fiscal 2015, overall municipal solid-waste capacity was about 1.9 billion tons, representing an average of 56 years of disposal capacity. This is a net decrease of approximately 15 million tons, or roughly 3.7 million cubic yards, compared with the capacity in fiscal 2013. Throughout the state, the existing trend is for regional landfills to serve the state's more-populous areas, while less-populous areas in West Texas are served by small, arid-exempt landfills that accept less than 40 tons per day.

Municipal Solid Waste

Texas had 199 active municipal solid waste landfills in fiscal 2015 (the most recent data available). Municipal solid waste disposal reached about 33.4 million tons.



To assist regional and local solid-waste planning initiatives, such as addressing adequate landfill capacity, the TCEQ provides solid waste planning grants to each of the 24 regional councils of governments. The planning initiatives are based on goals specified in each COG's regional solid-waste-management plan.

For the 2014–15 grant period, the COGs received about $10.9 million. Pass-through projects included recycling activities, cleanups of illegal dump sites (including illegal tire sites), household hazardous waste collection events, and education and outreach projects.

The *Solid Waste Grants Program Funding Report, FY2014–2015*, includes data collected by the TCEQ from the 24 COGs, and details the regional solid waste grant activities for that two-year period. The report will be available on the TCEQ's website in January 2017.

Environmental Assistance

Voluntary Programs

The TCEQ uses technical assistance, education, and pollution prevention programs to encourage environmental improvements. The Environmental Assistance Division (EAD) steers many of these programs in a direction that focuses on agency priorities and aligns with agency regulatory systems.

In fiscal 2015 and 2016, the division responded to 13,986 requests for assistance from small businesses and local governments. Of those, 663 received one-on-one assistance at their business site or facility.

In fiscal 2015, more than 180 small businesses and local governments took advantage of the EAD's Site Visit Program, which allowed them a site visit, during which a contractor of the TCEQ used a checklist to identify problems with environmental compliance. After the visit, the businesses and facilities received recommendations about actions they could take to resolve those problems. In fiscal 2015, 48 participants resolved the issues that were identified.

For fiscal 2016, the program was modified to focus resources on the requirements of the federal Energy Policy Act. Under that act, all registered petroleum storage tanks must undergo an investigation at least once every three years. Through the Site Visit Program, PST facilities have an opportunity to receive an Energy Policy Act site visit. If they achieve full compliance with the Energy Policy Act's checklist, they receive credit for their three-year investigation. Site visits do not lead to an investigation or citation, unless there is an imminent threat to human health or the environment.

In this first year of the new program focus, 178 site visits occurred, resulting in 77 compliant facilities. Those facilities that were not compliant received recommendations for resolving non-compliance issues so they can prepare for a future investigation under the Energy Policy Act.

In outreach to the smallest of water systems, the division developed an easy-to-use guide, *Managing Small Public Water Systems* (publication RG-501) in 2014. The guide includes simple instructions and worksheets to complete and maintain an asset-management plan with or without a computer. It covers system inventory and prioritization, planning, budgeting, assessing and protecting water sources, and best management practices.

Workshops on making the best use of RG-501 continued through fiscal 2015 and 2016 and were held in 13 cities, educating representatives from more than 350 water systems. Workshop locations included Midland, Uvalde, El Paso, Weslaco, Lubbock, New Braunfels, Denton, Rosenberg, Liberty, Cleveland, Texarkana, Tyler, and Golden.

Continuing with the same goal but focused on wastewater systems, the division developed another easy-to-use guide, *Managing Small Domestic Wastewater Systems* (RG-530). This guide also includes simple instructions and worksheets to complete and maintain an asset-management plan with or without a computer, and similarly covers system inventory and prioritization, planning, budgeting, and best management practices.

Workshops on making the best use of RG-530 were held in eight cities, educating representatives from more than 170 wastewater systems. Workshop locations included Round Rock, McKinney, Hillsboro, Conroe, Richmond, San Benito, Austin, and Tyler.

The TCEQ also offers educational opportunities and technical assistance through coordinated workshops, seminars, and education events, including the annual Environmental Trade Fair and Conference held in downtown Austin. During the last two years, the agency sponsored 15 seminars to provide technical information to almost 13,000 attendees.

For larger organizations such as refineries, universities, and municipal utility districts, the TCEQ offered technical advice on innovative approaches for improving environmental performance through pollution prevention planning.

All together, these efforts resulted in reductions of hazardous waste by more than 5,126,000 tons and toxic chemicals by about 4,126,000 tons during fiscal 2015–16.

Renewing Old and Surplus Materials

Texas established the Resource Exchange Network for Eliminating Waste (RENEW) in 1988 to promote the reuse or recycling of industrial waste.

The materials-exchange network has assisted in the trading of millions of pounds of materials, including plastic, wood, and laboratory chemicals. These exchanges divert materials from landfills and help participants reduce waste-disposal costs and receive money for their surplus materials. Additionally, exchanges help protect the environment by conserving natural resources and reducing waste.

RENEW is a free, easy-to-use service. Listings are grouped under "Materials Available" for anyone offering raw materials to other facilities, and "Materials Wanted" for anyone looking to find raw materials.

Through the RENEW website <www.renewtx.org>, these participants can list and promote information on opportunities for exchanging at national and regional levels.

In fiscal 2015 and 2016, 109 users signed up to use RENEW, and 215 new listings were posted.