Texas Nonpoint Source Management Program

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Texas Commission on
Environmental Quality

Texas State Soil and Water
Conservation Board

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Acronyms

AFO	Animal Feeding Operation
ARS	USDA Agricultural Research Service
BEACH Act	Beaches Environmental Assessment and Coastal Health Act of 2000
BECC	Border Environment Cooperation Commission
BEG	Bureau of Economic Geology
BMP	Best Management Practice
BPAT	Backflow Prevention Assembly Tester
CAFO	Concentrated Animal Feeding Operation
CBBEP	Coastal Bend Bays and Estuaries Program
CCAC	Coastal Coordination Advisory Committee
CCMP	Comprehensive Conservation and Management Plan
CFR	Code of Federal Regulations
CIAP	Coastal Impact Assistance Program
CMP	Coastal Management Program
COG	Council of Governments
CRP	Clean Rivers Program
CSI	Customer Service Inspector
CWA	Clean Water Act
CWQMN	Continuous Water Quality Monitoring Network
CWSRF	Clean Water State Revolving Fund
CZARA	Coastal Zone Act Reauthorization Amendments
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
DM&A	Data Management and Analysis Team
DOPA	Dairy Outreach Program Area
DR	Designated Representative
DSHS	Texas Department of State Health Services
E. coli	*Escherichia coli*
EDAP	Economically Distressed Areas Program
EPA	United States Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FSA	USDA Farm Service Agency
FSP	Forest Stewardship Program
GCD	Groundwater Conservation District
GBEP	Galveston Bay Estuary Program
GCRP	Gulf of Mexico Community-Based Restoration Program
GEMS	Gulf Ecological Management Sites
GLO	Texas General Land Office
gpd	gallons per day
GRTS	Grants Reporting and Tracking System
HAL	Health Advisory Level
HHW	Household Hazardous Waste
IBWC	International Boundary Water Commission, United States Section
I-Plan	Implementation Plan
IR	Integrated Report
IRD	Information Resources Division
KAST	Kills and Spills Team
KTB	Keep Texas Beautiful
LCRA	Lower Colorado River Authority

LID	Low Impact Development
LPST	Leaking Petroleum Storage Tank
LSHS	Lone Star Healthy Streams Program
Management Program	Texas Nonpoint Source Management Program
MCL	Maximum Contaminant Levels
MDL	Minimum Detection Level
mg/L	Milligrams per Liter
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MS4	Municipal Separate Storm Sewer Systems
MSD	Marine Sanitation Device
MSW	Municipal Solid Waste
NADB	North American Development Bank
NAWQA	National Water Quality Assessment Program
NCSS	National Cooperative Soil Survey Program
NEP	National Estuary Program
NGO	Non-Governmental Organizations
NIPF	Non-Industrial Private Forest
NMP	Nutrient Management Plan
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service
NUP	Nutrient Utilization Plan
OFCUF	Oil Field Cleanup Fund
OGRC	Oil and Gas Regulation and Cleanup
OGWDW	Office of Ground Water and Drinking Water
OMB	Office of Management and Budget
OSPR	Oil Spill Prevention and Response
OSPRA	Oil Spill Prevention and Response Act of 1991
OSSF	On-site Sewage Facility
PCB	Polychlorinated biphenyls
PFC	Permeable Friction Course
POINTS	Pesticides of Interest Tracking Program
POTW	Publically Owned Treatment Works
PPP	Pollution Prevention Plan
PSOC	Possible Source of Contamination
PST	Petroleum Storage Tank
PWS	Public Water System
QAPP	Quality Assurance Project Plan
RFGA	Request For Grant Applications
RRC	Railroad Commission of Texas
RSI	River Systems Institute
RUAA	Recreational Use Attainability Analysis
SCS	Sewage Collection System
SEP	Supplemental Environmental Projects
SERF	Shoreline Environment Research Facility
SMZ	Streamside Management Zones
SPCS	Structural Pest Control Service
SWA	Source Water Assessment
SWAP	Source Water Assessment and Protection

SWCD	Soil and Water Conservation District
SWP	Source Water Protection
SWQM	Surface Water Quality Monitoring
SWQMIS	Surface Water Quality Monitoring Information System
TAC	Texas Administrative Code
TAGD	Texas Alliance of Groundwater Districts
TCEQ	Texas Commission on Environmental Quality
TDA	Texas Department of Agriculture
TDLR	Texas Department of Licensing and Regulation
TDS	Total Dissolved Solids
TFS	Texas Forest Service
TGPC	Texas Groundwater Protection Committee
TIAER	Texas Institute for Applied Environmental Research
TISCC	Texas Invasive Species Coordinating Committee
TLAP	Texas Land Application Permits
TMDL	Total Maximum Daily Load
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TSSWCB	Texas State Soil and Water Conservation Board
TSWQS	Texas Surface Water Quality Standards
TWC	Texas Water Code
TWDB	Texas Water Development Board
TWON	Texas Well Owner Network
TWPC	Texas Watershed Protection Committee
TWRI	Texas Water Resources Institute
TWS	Texas Watershed Steward Program
TxDOT	Texas Department of Transportation
UAA	Use Attainability Analysis
USDA	United States Department of Agriculture
USGS	United States Geological Survey
UST	Underground Storage Tanks
VCP	Voluntary Cleanup Program
WAP	Watershed Action Planning
WET	Whole Effluent Toxicity
WPAP	Water Pollution Abatement Plan
WPP	Watershed Protection Plan
WQAT	Water Quality Assessment Team
WQBEL	Water Quality-Based Effluent Limit
WQMP	Water Quality Management Plan
WTS	Water Treatment Specialist

Chapter 1 Introduction

The *Texas Nonpoint Source Management Program* (Management Program) is required under Clean Water Act (CWA), §319(b). The Management Program outlines Texas' comprehensive strategy to protect and restore water quality impacted by nonpoint sources of pollution. Nonpoint source (NPS) pollution comes from rainfall runoff, snowmelt, atmospheric deposition, and other means that carry pollutants to rivers, lakes, coastal waters, and groundwater. The Management Program is jointly administered by the Texas Commission on Environmental Quality (TCEQ) and the Texas State Soil and Water Conservation Board (TSSWCB). The Management Program describes the specific programs and processes the state uses to address NPS pollution, and provides for the coordination of NPS-related activities, establishment of statewide goals, prioritization of assessment and implementation activities, and tracking and reporting of program activities.

Nonpoint Source Pollution

Every river, stream, lake, reservoir, and estuary has a watershed. Each watershed encompasses many land uses and supports a variety of economic activities. To a large extent, water quality within a watershed is linked to the actions of the people who live, work, and play within its boundaries. Water quality problems can be a result of either point source or NPS pollution.

Point source pollution comes from single, identifiable sources such as the discharge from municipal or industrial treatment systems and concentrated animal feeding operations (CAFOs). Point sources are regulated under the CWA and Texas law and are subject to permit requirements that focus on water quality protection. These permits specify effluent limits, monitoring requirements, and enforcement mechanisms.

Due to the diffuse nature of NPS pollution, it cannot be identified and characterized with the same level of specificity and accuracy as point sources. As a result, evaluating the impacts of NPS pollution and the effectiveness of mitigation activities is difficult. NPS pollution originates from many different locations. Common NPS pollutants include:

- fertilizers, herbicides, and insecticides from residential areas and agricultural lands;
- oil, grease , toxic chemicals, chlorides and/or total dissolved solids from spills, roads, urban areas, and energy production;
- sediment from construction sites, crop and forest lands, and eroding stream banks; and
- bacteria and nutrients from livestock, pets, wildlife, and leaking septic systems.

Assessment of Nonpoint Source Pollution - Surface Waters

NPS pollution enters surface waters in a diffuse manner and at intermittent intervals during periods of precipitation. The amount, timing, and duration of these events are determined by meteorological conditions. Due to their widespread and variable nature, precise sources of NPS pollution can be difficult to trace. However, it is known that contaminated runoff from urban and rural areas, whether or not the source can be pinpointed, may result in degradation of water quality and nonsupport of designated water uses.

NPS pollution is known or suspected to be responsible for water quality impairments in streams, rivers, reservoirs, and bays in Texas. According to data compiled by the United States Environmental Protection Agency (EPA) from information provided by the states and summarized in Table 1.1, NPS pollution contributes to approximately 45 % of the water quality impairments to rivers and streams and 48 % of the water quality impairments to lakes in Texas. Approximately 22 % of the sources of impairment are of an "unknown" origin. States also report the causes of water quality impairments. This information indicates elevated levels of bacteria, metals, and depressed levels of dissolved oxygen are the cause of most impairments to water quality in streams, reservoirs, and bay segments in the state.

Table 1.1 Texas Probable Sources Contributing to Impairments for Reporting Year 2008[1]

Probable Source Group	Rivers and Streams (Miles)	Lakes, Reservoirs, and Ponds (Acres)	Bays and Estuaries (Square Miles)
Agriculture[2]	690.9		
Aquaculture	9.5		
Atmospheric Deposition[2]	1.0	3,753.9	1.6
Habitat Alterations[2]	0.5		
Hydromodification[2]	11.0	2,410.0	
Industrial	73.9	1,516.0	1.6
Land Application/Waste Sites/Tanks	5.6		
Legacy/Historical Pollutants		1,516.0	
Municipal Discharges/Sewage	785.2		
Natural/Wildlife[2]	612.9	150.0	
Other	249.0	2,710.0	
Resource Extraction	12.6		
Unknown	1,070.2	4,228.9	1.6
Unspecified NPS[2]	848.0	2,710.0	
Urban-Related Runoff/Storm water	430.8		1.6

1 National Integrated Report for CWA §s 305(b) and 303(d), EPA, 2009
2 Categories of NPS

Assessment of Nonpoint Source Pollution - Groundwater

NPS contamination is widespread in many Texas aquifers. While there are a variety of pollutants of concern in groundwater (see Appendix D), the most widespread contaminant is nitrate, with a variety of potential sources. Potential nitrate sources may include leaking septic systems, infiltration of storm water runoff, over application of fertilizer on urban and agricultural land, and naturally occurring nitrate derived from the aquifer matrix. The most recent sampling conducted by the Texas Water Development Board (TWDB) showed 122 wells of 736 sampled exceeded primary maximum contaminant levels (MCLs) for nitrate. From 1998 through 2007, TWDB sampled 5,647 wells for nitrate, with 1,612 presenting nitrate concentrations that exceeded the MCL. An additional 2,316 wells showed the presence of nitrate, but did not exceed the MCL (*2010 Texas Water Quality Inventory and 303(d))*. This sampling underscores the reason for the state's concern for the groundwater quality in rural Texas, the groundwater resource that is most likely to be impacted by NPS pollution.

NPS Water Quality Challenges

Texas has a large number of water bodies that, as illustrated in Figure 1.1, are separated into 23 river and coastal basins. There are 11,247 named streams and rivers with a total combined length of 191,228 miles. However, only 40,194 miles of streams and rivers (21 %) are considered perennial, meaning that they have sustained flow throughout the year. Texas also has 9,993 inland reservoirs and lakes 10 acres or larger in size that together cover approximately 1,994,600 acres. Of those, 211 are major reservoirs which each impound greater than 5,000 acre-feet of water. Texas bays and estuaries cover approximately 2,393 square miles along a coastal shoreline that stretches 624 miles. The Gulf of Mexico, within Texas' jurisdiction (Gulf shoreline out to nine nautical miles), covers approximately 3,879 square miles. In the contiguous United States, Texas ranks first in total square miles (4,959) covered by fresh and salt water.

The future success of reducing NPS pollution impacts will depend upon a coordinated effort of state and local officials, planners, developers, and citizens. Technical assistance and outreach to local and regional governments is an integral component of NPS implementation efforts. Land use management decisions are best made in the local arena where buy-in by the affected parties is crucial to sustainability and success. Government planners and zoning authorities around the United States are beginning to tie together the disciplines of urban planning with the need for water conservation, NPS pollution abatement, and water quality improvement.

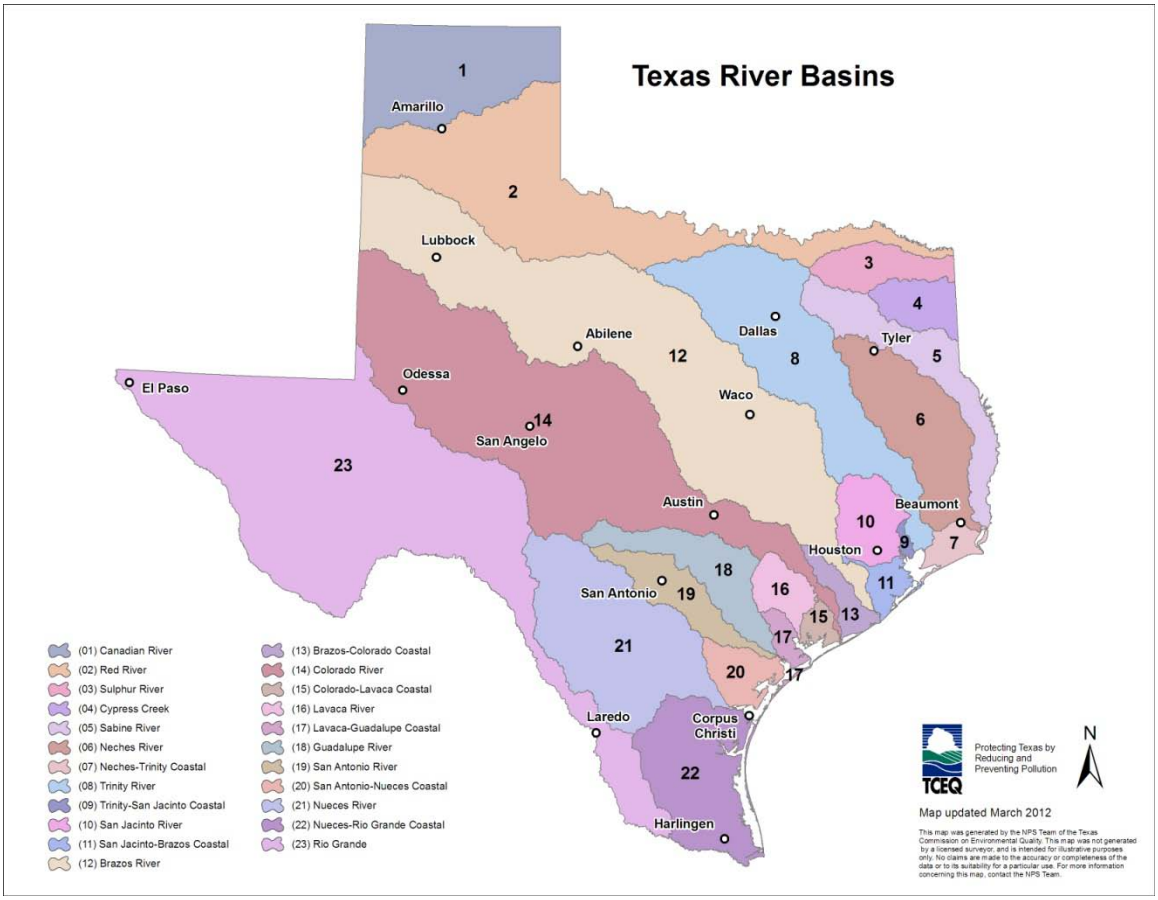

Figure 1.1 Texas River Basins

The TWDB estimates the population in Texas will more than double between the years 2000 and 2060 (2007 State Water Plan). This population growth will cause urban growth, resulting in increases in the amount of land covered by impervious surfaces, such as buildings, roadways, and parking lots. These changes can result in higher runoff volumes, increased pollutant loadings, a greater potential for downstream flooding, erosion of stream channels, reduced base flows, and reduced groundwater infiltration. Urban development also results in modifications to natural drainage systems. This urban growth pushes the urban-rural fringe further away from urban cores, resulting in the loss of wetlands, riparian areas, and stream buffers, thereby reducing the environment's natural ability to absorb storm flows and to filter contaminants before they reach nearby water bodies.

Effective state and local management and oversight of decentralized wastewater treatment systems are crucial to correcting and avoiding NPS problems in many developing areas where on-site sewage facilities (OSSFs), or septic tanks, may be the most cost-effective option available for managing domestic wastewater. About 25 % of the population in the United States depends upon decentralized wastewater treatment systems or OSSFs, and these systems are expected to be used in about 37 % of new development, primarily in low-density urban and suburban areas. Improved operation and maintenance of OSSFs are essential to

NPS management.

Possible NPS pollutants associated with agricultural and silvicultural (forestry-related) activities include sediment, nutrients, pesticides, organic matter, and bacteria. Sediment, resulting from erosion from cropland, pastureland, rangeland, forestland, and stream banks, fills up ponds and drainage ditches, chokes streams, and fills in estuaries. Sediment can also carry fertilizers and pesticides to surface waters. Excess nutrients and pesticides can also be carried in solution by runoff into surface waters and can seep into groundwater. Nutrients, pesticides, and other pollutants can come from a variety of sources including over-fertilized fields, runoff from improperly managed animal operations and waste applications, inaccurate pesticide sprayer settings, and dozens of other sources.

Despite the relative abundance of water available in Texas, it is not uniformly distributed throughout the state. During recent periods of drought, surface and ground water supplies have been nearly depleted in some localized areas. Reductions in available surface and ground water supplies have already limited urban growth and agricultural production in some areas of the state. As the Texas population continues to grow at a rapid pace, the need to conserve, protect, and restore the quality and quantity of surface and ground water supplies is paramount.

Because of its diffuse nature, NPS pollution can be more difficult and costly to characterize and control than point source pollution. The amount and variety of precipitation, land use, and geography all drive the effects of NPS pollution. The lack of a single identifiable source of pollution makes it difficult to establish specific cause-and-effect relationships.

Other challenges to NPS pollution management in Texas are low public awareness of the issues, the size and complexity of the problem, the lack of rigorous scientific definition of NPS problems, institutional barriers to directing multiple sources of funding to a diffuse problem, and availability or lack of awareness of funding sources other than CWA §319(h) grants to address the problems. In addition, it is difficult, and in some cases impossible, to measure NPS pollution or to quantify in-stream load reductions due to NPS implementation activities.

Watershed Action Planning in Texas

Watershed Action Planning (WAP) is an approach that emphasizes the role of partner agencies and stakeholders, relies on sound technical information, and makes available multiple options to provide the flexibility needed to address varied watershed conditions and circumstances. The objective of the approach is to plan, implement, and track water quality management strategies to protect and restore water quality in an efficient, effective, and appropriate manner.

The WAP process is illustrated in Figure 1.2. The process consists of coordinating with stakeholders on how to apply the state's water quality planning programs to specific water bodies. The process is implemented on an annual basis. This is accomplished by gathering watershed-specific information at the local level, integrating this information into state water quality planning programs, and coordinating the resulting strategies with other federal, state, regional, and local stakeholders. The result of this annual process is a listing of all water quality impairments (and concerns/threats of high priority) in the state that identifies what will be done to address the impairment, the party responsible for undertaking the action, a schedule to complete action, and a means of tracking progress. WAP is the basis that each partner agency, and stakeholder uses for planning, budgeting, and implementing program activities as they relate to addressing impaired waters in the state. Those water bodies impacted by NPS pollution will be extracted from the WAP database, currently a spreadsheet designed to capture strategies by river basin is in use, and addressed by this Management Program. Participation in WAP is available at different stages to partners, stakeholders, and the public.

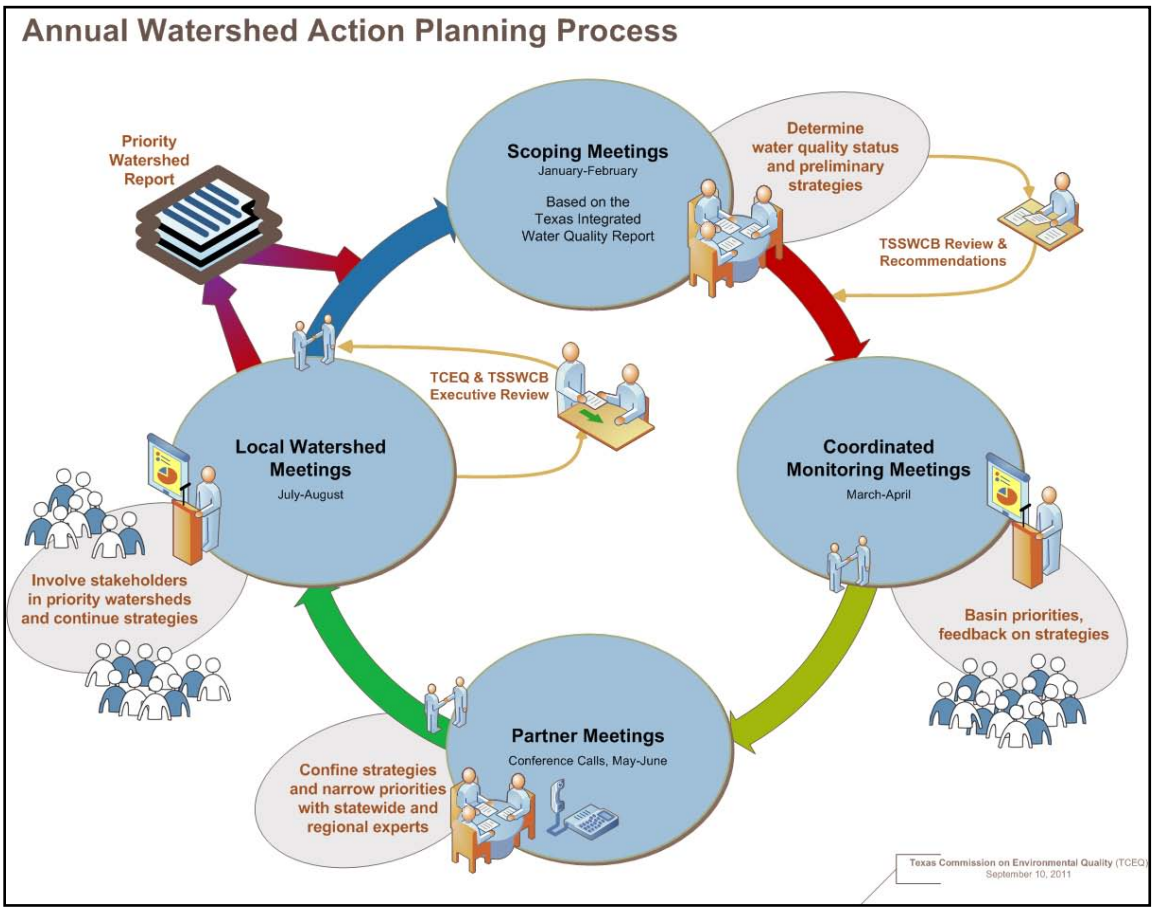

Figure 1.2 Watershed Action Planning Process

The state water quality planning programs use the infrastructure of the Texas Clean Rivers Program (CRP), soil and water conservation districts (SWCDs), river

authorities, Texas Groundwater Protection Committee (TGPC), Coastal Coordination Advisory Committee (CCAC), and other mechanisms to coordinate, develop, and implement WAP and this Management Program.

Solving Nonpoint Source Pollution Issues

It is critical to engage local stakeholders in the assessment and evaluation of a watershed's water quality impairments and concerns, as well as in the development and implementation of necessary management strategies to abate NPS pollution. Watershed analyses are used to specify quantifiable targets for water quality improvement, and watershed plans outline actions necessary to attain and maintain applicable water quality standards and goals. The TCEQ and TSSWCB are active in supporting each phase of the watershed management process, from initial identification of impaired and threatened waters, to implementation and oversight of priority solutions.

Nine Components of the Texas NPS Management Program

As prescribed by EPA's *Nonpoint Source Program and Grants Guidance for Fiscal Year 1997 and Future Years* (published May 1996) and restated in the most recent program guidance *Nonpoint Source Program and Grants Guidelines for States and Territories (October 2003),* Texas' Management Program incorporates EPA's nine components of an effective program, which allows for maximum flexibility in managing NPS pollution. These components are listed below, with a summary of how the state has addressed them in this Management Program. Many specific examples of the state's application of these nine components may be found throughout this document in the descriptions of various programs and management strategies.

Component 1
Explicit short- and long-term goals, objectives, and strategies that protect surface and ground water.

The state has established long- and short-term goals and objectives for guiding and tracking the progress of NPS management in Texas. The section "Goals for NPS Management" in Chapter 2 details these goals and the milestones by which progress toward meeting these goals and objectives will be measured. Success in achieving the goals and objectives is reported annually in the *Annual Report on Managing NPS Water Pollution in Texas*. Many individual programs from various agencies identified in this document have also established specific long- and short-term goals that are compatible with these overall Management Program goals.

Component 2
Working partnerships and linkages to appropriate State, interstate, Tribal, regional, and local entities, private sector groups, and Federal agencies.

Surface water and aquifers are not limited by political boundaries and, as a result, environmental solutions often cross federal, state, and local levels of responsibility. With the extent and variety of water quality issues across Texas, the need for cooperation at all levels is essential.

As described in Chapter 4 of the Management Program, the state coordinates, develops, and implements the Management Program by using the existing infrastructure of the CRP, SWCDs, TGPC, CCAC, universities, and other organizations creating an enhanced network that performs in conjunction with state, federal, regional, and local entities. The WAP process described in Chapter 3 of the Management Program also provides a forum for coordinating stakeholder activities related to priority water quality issues. Through this infrastructure, the state establishes working partnerships for obtaining consensus and input on NPS issues to:

- identify priority watersheds with NPS water quality problems;
- formulate the steps necessary to address any known water quality problems within those watersheds; and
- secure and target resources in order to develop and implement NPS strategies that restore water quality.

A description of various agencies and programs that are used to address NPS pollution in Texas are presented in Chapter 5 of this Management Program.

Component 3
Balanced approach that emphasizes both statewide NPS programs and on-the-ground management of individual watersheds.

Activities in Texas that address NPS pollution involve both statewide strategies and local initiatives. NPS activities are managed with a geographical focus where work can be directed to be most effective. For example, one of Texas' primary statewide efforts is public outreach and education. The TSSWCB educates agricultural stakeholders throughout the state on how their activities may contribute to NPS pollution, what measures they can take to minimize their impacts and financial incentives that are available to help them implement these measures. The TCEQ has numerous programs throughout the agency that play significant roles in the area of statewide public education. In addition to statewide public outreach and education efforts, the CRP, local SWCDs, Texas AgriLife Extension Service, and groundwater conservation districts (GCDs) are some of the programs that provide the framework for public outreach on a local watershed level. Other state, regional, and local efforts to address

NPS pollution are described in detail throughout this document.

As described in Chapter 2 of the Management Program, the state applies the Watershed Approach to managing NPS pollution. Efforts to restore and protect water quality are achieved through the development and implementation of Watershed Protection Plans (WPPs) and Total Maximum Daily Loads (TMDLs) in those watersheds where NPS pollution is contributing to a water quality impairment or concern.

Texas' balanced approach of both statewide and watershed programs are described in more detail in Chapter 4 of the Management Program.

Component 4
Abatement of known water quality impairments from NPS pollution and prevention of significant threats to water quality from present and future NPS activities.

As described in Chapter 3 of the Management Program, the TCEQ and TSSWCB use WAP to focus on the most significant NPS surface water quality problems. WAP provides a basis for prioritizing projects to address surface water quality impairments from known sources. In selecting projects for funding, the TCEQ and the TSSWCB give the highest consideration to projects which address the most significant threats to water quality and have the best potential to prevent or reduce NPS pollution and improve water quality.

Many TSSWCB and TCEQ programs are voluntary and preventive in nature or incorporate pollution prevention activities. Texas also uses regulatory approaches to prevent pollution as described later in this document. The TCEQ, TSSWCB, and other state programs that carry out NPS management activities are described in Chapter 5.

Component 5
Identify waters and their watersheds impaired by NPS pollution and identify important unimpaired waters that are threatened or otherwise at risk. Progressively address these identified waters by conducting more detailed watershed assessments and developing watershed plans (e.g., WPPs or TMDLs and Implementation Plans), and then by implementing the plans.

Texas routinely assesses and monitors water quality under programs administered by the TCEQ. Data are collected by federal, state, regional, and local agencies and are compiled into the Integrated Report (IR). The IR categorizes water bodies impaired by NPS pollution, according to their status, and, based on WAP, sets forth the method by which the state will approach identified NPS problems. CWA §303(d)-listed surface water bodies are further categorized to determine the priorities for doing further

water quality assessments or implementing restoration activities. This strategy is described in the WAP process. The management strategies detailed through the WAP process lay out the procedures that the TCEQ and TSSWCB will use to progressively address impaired or threatened surface water bodies.

The state assesses groundwater by compiling the groundwater portion of the IR specific to Texas' aquifers. The *Texas Groundwater Protection Strategy* serves as the statewide plan outlining responsibilities and goals for agencies and organizations with groundwater protection interests.

The state's water quality assessment and planning programs are described in more detail in Chapters 3, 4, and 5 of the Management Program.

Component 6

Implement all NPS program components required by CWA §319(b) and establish flexible, targeted, and iterative approaches to achieve and maintain beneficial uses of water as expeditiously as practicable, including:

- *a mix of water quality-based and/or technology-based programs designed to achieve and maintain beneficial uses of water; and*
- *a mix of regulatory, non-regulatory, financial, and technical assistance as needed to achieve and maintain beneficial uses of water as expeditiously as practicable.*

Management measures in TMDLs and I-Plans or WPPs identify best management practices (BMPs) that are designed to improve water quality. Development of a WPP or a TMDL and Implementation Plan (I-Plan) are the first steps of an effective NPS implementation program. The successful implementation of these plans is largely dependent on the early and sustained participation and involvement of stakeholders in the watershed. Early and sustained stakeholder participation and buy-in also provides the best possible setting for implementing subsequent management strategies called for in the action plans and future sustainability. The Management Program describes established regulatory, non-regulatory, financial, and technical assistance programs used by the state and regional agencies in the implementation of statewide and watershed programs.

The state's implementation programs are described in more detail in Chapters 3, 4, and 5 of the Management Program.

Component 7

Identify federal lands and activities which are not managed consistently with state NPS program objectives and seek EPA assistance to help resolve issues.

The state has established formal agreements with key federal agencies to

enhance the state's ability to provide a coordinated response to needs identified in priority watersheds. Only 1 % of the total land area of Texas is owned, leased, or otherwise managed by federal agencies (*FY2009 Federal Real Property Statistics*, U.S. General Services Administration). However, many of these lands, especially those managed by natural resource agencies, are located adjacent to major water bodies resulting in immediate and significant impact to water quality if not managed consistently with Management Program goals and objectives.

A list of some of the agreements and strategic partnerships can be found in Chapter 5 of the Management Program.

Component 8
Manage and implement the NPS program efficiently and effectively, including necessary financial management.

The state takes its fiduciary responsibilities, related to the management of public funds, very seriously. The TSSWCB and TCEQ have established operating procedures and tracking systems to ensure the effective use of CWA §319 grant funds for addressing identified water quality problems. Both agencies conduct a meeting at the beginning of all projects, with all contracted collaborating entities, to review what will be required throughout the course of the project. The respective agency staff maintains close contact with collaborating entities and provides oversight throughout the course of each project. Agency staff stays in continuous contact with the EPA project officers regarding the status of the program. In order to enhance the efficiency and effectiveness of grant management as well as strengthen policies and procedures that govern the contracting process, both agencies continually review and update contractor performance criteria.

Component 9
Periodically review and evaluate the NPS management program using environmental and functional measures of success, and revise it at least every five years.

The TCEQ and TSSWCB are committed to comprehensively updating the Management Program periodically. TSSWCB and TCEQ will review the Management Program and provide major programmatic revisions at least every five years, and priority activity updates, at least biennially, to reflect activities planned through the WAP process.

The 2012 update to the Management Program was made available for stakeholder review and formal public comment. Most of the comments received provided clarification of general information used in the document, programmatic matters, and editorial changes. Public comments and the state's responses are presented in Appendix F, Table F.1 of the

Management Program.

The 2012 update to the Management Program provides an opportunity to recognize and document significant recent improvements in the state's efforts to improve water quality. These initiatives are as follows:

- the WAP process provides an important new perspective on deciding how to address water quality issues in the state and will allow planning activities to be implemented in a more open and coordinated manner;
- Texas has seen rapid growth in stakeholder interests in the development of WPPs as a vehicle to address water quality issues in their watershed;
- there has been increased coordination with state partners including an increased use of state revolving loan funds to address pollution sources in impaired watersheds through the TWDB;
- there has been progress with the Texas General Land Office (GLO) moving the state closer to full approval of the *Texas Coastal NPS Pollution Control Program*; and
- as referenced in Appendix E of the Management Program, a comprehensive suite of program performance measures has been incorporated to enhance program accountability, tracking, and reporting.

The Management Program will rely on existing forums provided by WAP, Management Program updates, the *Annual Report on Managing NPS Pollution in Texas*, CWA §319(h) annual grant cycles, and partner activities such as the CRP, SWCDs, TGPC, and others to continue the evaluation of the Management Program.

Chapter 2 Texas Nonpoint Source Management Program Overview

Nonpoint sources of pollution are largely unregulated and a majority of the activities designed to reduce their impact on water quality falls on the states' NPS Management Programs administered under CWA §319. Texas addresses the requirements of CWA §319, to manage NPS pollution in surface and ground water, through the Management Program. The TSSWCB administers the Management Program for agricultural and silvicultural NPS pollution and the TCEQ administers the Management Program for all other nonpoint sources. CWA §319 consists of three broad components as defined by CWA §§319(a), 319(b), and 319(h). These requirements are presented in Table 2.1 and discussed below.

Table 2.1 CWA §319 Nonpoint Source Program

Assessment Report CWA §319(a)	Management Program CWA §319(b)	Grant Program CWA §319(h)
Identifies water bodies impacted by nonpoint sources that do not meet water quality standards(1)	Identifies the BMPs and measures to reduce pollutant loadings from nonpoint sources	Outlines application requirements, including an identification and description of the BMPs
Identifies categories of nonpoint sources which add significant pollution to impacted water bodies(1)	Identifies programs(3) to achieve implementation of the BMPs	Identifies how grant funds will be allocated
Describes the process for identifying BMPs and measures to control nonpoint sources(2)	Includes a schedule with milestones for utilization of the program(3) implementation methods and implementation of the BMPs	Identifies priorities for grant funds
Identifies and describes state and local programs for controlling pollution added from nonpoint sources(2)	Identifies sources of federal and other assistance and funding and purposes for which it will be used	States the requirement for annual reporting to the EPA regarding progress toward milestones and as appropriate, reductions in loadings and improvements in water quality

(1) Texas Integrated Report
(2) Texas NPS Management Program
(3) Programs may include: nonregulatory or regulatory programs for enforcement, technical assistance, financial assistance, education, training, technology transfer, and demonstration projects.

Texas NPS Assessment Report

The Texas NPS Assessment Report is provided as the state's integrated report (IR). The TCEQ's Surface Water Quality Monitoring Program produces the state's §305(b) assessment and §303(d) list of impaired waters every two years in accordance with the requirements of the CWA. The IR identifies water bodies where observed water quality conditions do not support their designated uses and makes a preliminary determination as to whether or not NPS pollution contributes to the impairment. The state's water quality assessment programs are described more fully in Chapter 4 of the Management Program. The list of impaired water bodies which have a NPS contribution forms the basis for the state to initiate the WAP process to target and schedule program activities.

Texas NPS Management Program

The Management Program is the state's official plan for addressing NPS pollution. The program publication is updated periodically. The last revision was submitted to the EPA by the Governor in December 2005. The TCEQ and the TSSWCB jointly administer the Management Program.

The TCEQ is charged with managing the quality of the state's water resources. Accordingly, the TCEQ has general jurisdiction and primary responsibility over the state's water quality program, including water quality planning, issuance of permits for point source discharges, abatement of NPS pollution from sources other than agriculture and silviculture, and enforcement of water quality rules, standards, orders, and permits.

The TSSWCB is the lead state agency responsible for planning, implementing, and managing programs and practices for preventing and abating agricultural and silvicultural NPS water pollution (Texas Agriculture Code §201.026).

The TCEQ and the TSSWCB have a Memorandum of Understanding (MOU), which sets forth the coordination of jurisdictional authority, program responsibility, and procedural mechanisms for point and nonpoint source pollution control programs (30 TAC , Chapter 7, §7.102). Additionally, the TCEQ and the TSSWCB have a Memorandum of Agreement (MOA), which describes the programmatic mechanisms employed to develop and implement water quality protection and restoration programs (*http://www.tsswcb.texas.gov/tmdl#moa*).

The Management Program utilizes water quality management programs and regulatory, voluntary, financial, and technical assistance approaches to achieve a balanced program. NPS pollution is managed through assessment, planning, implementation, and education. The state has established long- and short-term goals and objectives for guiding and tracking the progress of NPS management in Texas. Success in achieving the goals and objectives is reported annually in the

Annual Report on Managing NPS Water Pollution in Texas, which is submitted to EPA in accordance with the CWA.

In accordance with CWA §§ 205(j), 208, and 303 and 40 Code of Federal Regulations (CFR) §130.2(k), the *Texas Water Quality Management Plan* (WQMP) is required to address matters related to designated management agencies, effluent limitations for wastewater facilities, TMDLs, NPS management, dredge and fill programs, and groundwater programs. The WQMP is used to direct planning for implementation measures that control and/or prevent water quality problems. This *Texas NPS Management Program* is a required element of the state's WQMP.

Implementation of the Management Program involves partnerships among many organizations. With the extent and variety of NPS issues across Texas, cooperation across political boundaries is essential. Many local, regional, state, and federal agencies play an integral part in managing NPS pollution, especially at the watershed level. They provide information about local concerns and infrastructure and build support for the kind of pollution controls that are necessary to prevent and reduce NPS pollution. SWCDs are vital partners in working with landowners to implement BMPs that prevent and abate agricultural and silvicultural NPS water pollution. By establishing coordinated frameworks to share information and resources, the state can more effectively focus its water quality protection efforts.

Texas CWA §319(h) Grant Program

Congress enacted CWA §319(h) in 1987, establishing a national program to control NPS water pollution. Through §319(h), federal funds are provided annually through the EPA to states for the implementation of each state's NPS Management Program. Based on Congressional appropriations, EPA allocates 319(h) funds by formula to the states. The most recent six years of formula allocations to Texas are shown in Table 2.2. The §319(h) funding in Texas is divided equally between the TCEQ and the TSSWCB. Each agency independently administers its portion of the grant. Each agency annually solicits projects from collaborating entities across the state. Each agency identifies priority areas and activities and ranking criteria for each funding cycle based on this Management Program, the most recent IR, and the WAP process.

Table 2.2 CWA §319(h) NPS Grant Allocations to Texas

Federal FY	Texas Allocation
2007	$ 9,370,100
2008	$ 9,157,400
2009	$ 9,157,400
2010	$ 9,157,400
2011	$ 7,954,000

State Priorities for CWA §319(h) Funding

Texas establishes priorities for its CWA §319(h) grant program, with highest priority given to funding those projects or activities which address water bodies not meeting water quality standards due to NPS pollution, as identified in the Texas §303(d) List. The TCEQ and TSSWCB use the IR and the WAP process to establish priorities for §319(h) grant funding. This helps to ensure fiscal responsibility by providing focus for the use of limited financial resources.

Generally, priorities for §319(h) funding are as follows:

- Texas will develop WPPs or TMDLs in impaired water bodies identified as impacted by NPS pollution in the IR;
- the state will develop I-Plans for TMDLs adopted to eliminate water quality impairments to the extent practicable under state and federal statutes, programs, and resources;
- Texas will implement WPPs and TMDL I-Plans to address NPS water quality issues to the extent practicable under state statutes, programs, and resources;
- the state will continue to conduct activities to prevent the degradation of water quality; and
- the state will facilitate implementation of activities to restore and protect groundwater quality.

Resource Leveraging

The majority of the state of Texas' annual CWA §319(h) grant allocation is "passed through" to political subdivisions and non-governmental organizations (NGOs) by the TCEQ and TSSWCB through the execution of interagency or inter-local contracts. CWA §319(h) contractors are considered sub-recipients and, as such, are subject to all applicable federal regulations and statutes.

For the Management Program to be effective on both a statewide and watershed level, the TCEQ and TSSWCB must work closely with other state, regional, and local organizations to implement management measures and optimize the use of all available resources. The extent of monetary resources needed to effectively address NPS pollution and restore beneficial uses is greater than the amount of funding available from the CWA §319(h) grant program alone. Consequently, the Management Program encourages the use of leveraged resources when feasible. For example, the state has worked closely with United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) to leverage federal Farm Bill monies (i.e., the Environmental Quality Incentives Program) with CWA §319(h) grants to abate agricultural NPS pollution and address water quality impairments on the §303(d) List. Also, the state has worked with GLO to leverage Coastal Impact Assistance Program (CIAP) funding for projects that both reduce NPS pollutant loadings to impaired water bodies and which meet the requirements of the *Texas Coastal NPS Pollution Control Program*. CIAP is a federally funded program with royalties from offshore oil and gas leases. CIAP

assists states that have either supported or been impacted from oil and gas exploration and development along the Outer Continental Shelf. CIAP is providing funding to produce a guidance document for managing municipal storm water and non-regulated urban NPS discharges to impaired waters.

Federal Match Requirement

The CWA §319(h) grant program requires federal funds to be matched with 40% non-federal funds. "Match" refers to funds or services used to conduct a project that are not sustained by federal funds. All project match must: (1) relate directly to the project for which the match is being applied; (2) be reasonably valued; and (3) be supported by documentation. The match does not have to originate with the grant recipient but can come from individuals, outside organizations, other local governments, or state agencies as long as the source of the matching funds is non-federal and is not being used to match another federal grant program. Eligibility requirements under §319 apply equally to federal and matching funds.

Matching can be financed in several ways:

Cash
These are costs that relate directly to the project for which the match is being applied and which are paid by the grant recipient.

In-Kind Services
In-kind services are typically defined as a contribution which has a cash value associated with it but may not require a cash outlay during the grant period. In-kind contributions may consist of the donation of real property, space, and equipment. It could also refer to a donation of time or services directly benefiting the grant project and specifically identifiable with it. The use of "in-kind" donations to meet grant matching requirements is regulated in 40 CFR §30.307 and §31.24 (6) and (7), and is also covered in the Office of Management and Budget (OMB) Circular A.

Federal Consistency Review of Other Assistance Programs

CWA §319(b)(2)(F) requires the Management Program to contain an identification of federal financial assistance programs and federal development projects for which the state will review individual assistance applications or development projects for their effect on water quality, to determine whether such activities would be consistent with the Management Program. The Texas Review and Comment System, coordinated through the Office of the Governor, had been utilized to fulfill this requirement in the past. This system was eliminated by the Office of the Governor in March 2011. As a result, grant applicants follow procedures outlined by the OMB at *http://www.whitehouse.gov/omb/grants_spoc*. Consistency review of urban,

non-agricultural, and non-silvicultural programs is the responsibility of the TCEQ. Consistency of agricultural and silvicultural programs is reviewed by the TSSWCB. Record keeping and public review of these documents is in accordance with the requirements of the individual agency or program area responsible for the review.

Appropriate programs and projects from the Catalog of Federal Domestic Assistance will be reviewed by the state for consistency with the Management Program. The state is committed to reviewing and identifying federal land management programs and projects, development projects and financial assistance programs that are or may be inconsistent with the Management Program. Potential inconsistencies are often resolved by the federal agency preparing a National Environmental Policy Act document, or by the U.S. Army Corps of Engineers in their decisions regarding the applicability of CWA §404 permitting requirements. When significant inconsistencies are not resolved, the state will seek EPA assistance to help resolve issues.

Texas Coastal NPS Pollution Control Program

The federal Coastal Zone Act Reauthorization Amendments (CZARA), of the Coastal Zone Management Act (CZMA), §6217 requires each state with an approved coastal zone management program to develop a federally approvable program to control coastal NPS pollution. The Texas Coastal Management Program (CMP) was created to improve the management of the state's coastal resources to ensure the long-term ecological and economic productivity of the coast. The CMP was administered by the Coastal Coordination Council until 2011 when the Texas Legislature transitioned administration of the program to the GLO. The GLO is advised in its administration of the CMP by the CCAC which consists of members of the former Coastal Coordination Council including the TCEQ, TPWD, TSSWCB, and the Texas Department of Transportation (TxDOT).

At the federal level, the National Oceanic and Atmospheric Administration (NOAA) and the EPA jointly administer §6217. In Texas, the TCEQ and the TSSWCB hold primary responsibility for the implementation of the *Texas Coastal NPS Pollution Control Program*. EPA's *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* under §6217(g) (published in January 1993) calls for Coastal NPS Pollution Control Programs to address five major categories of nonpoint sources that impair or threaten coastal waters nationally: (1) agricultural runoff; (2) urban runoff (including developing and developed areas); (3) silvicultural runoff; (4) marinas and recreational boating; and (5) hydromodification (channelization and channel modification, dams, and streambank and shoreline erosion). The guidance specifies management measures or strategies which reflect the greatest degree of pollutant reduction achievable through the application of pollution control practices, technologies, processes, siting criteria, and operating methods. A map of the Coastal Zone Management Area is illustrated in Figure 2.1.

Figure 2.1 Coastal Zone Boundary for the CMP and CZMA §6217

Texas submitted the *Texas Coastal NPS Pollution Control Program* to EPA and NOAA in December 1998. On July 2003, NOAA and EPA conditionally approved the *Texas Coastal NPS Pollution Control Program*. The document discusses the coastal NPS management area; an overview of program implementation and coordination; presentation of specific NPS categories, the §6217 management measures, and the state rules and programs which address pollution sources and meet the federal requirements; information on additional management measures, technical assistance, public participation; and program monitoring and evaluation. The *Texas Coastal NPS Pollution Control Program* is incorporated by reference as part of this *Texas NPS Management Program*.

Texas continues to seek full approval by addressing the remaining conditions identified by NOAA and EPA. In its approval of the state program in 2003, NOAA identified six areas the state must strengthen or correct including three urban

measures, onsite disposal systems, hydromodification, and non-TxDOT roadways. Texas had five years to meet the remaining conditions to gain full approval. In July 2008, the state responded to the remaining conditional approval findings of NOAA and EPA. It was anticipated that this response would address the remaining conditions resulting in a fully-approved program. However, in May 2009, GLO received comments from NOAA and EPA which concluded that enough progress had been made to lift only the condition related to hydromodification. The GLO, TCEQ, and TSSWCB continue to negotiate with EPA and NOAA for full approval.

Texas Groundwater Protection Strategy

The Texas Legislature has charged the TGPC with developing a comprehensive groundwater protection strategy for the state that provides guidelines for the prevention of contamination and for the conservation of groundwater and that provides for the coordination of the groundwater protection activities of the various agencies involved in groundwater issues (Texas Water Code (TWC), §26.405(2)).

The *Texas Groundwater Protection Strategy* describes the regulatory and nonregulatory programs used by the state to protect and remediate the quality of groundwater resources and to conserve the supply of groundwater. The *Strategy*, most recently revised in February 2003, includes components addressing NPS pollution prevention and abatement. The *Texas Groundwater Protection Strategy* is incorporated by reference as part of this *Texas NPS Management Program*. As of the printing of this document the *Texas Groundwater Protection Strategy* is under review.

Watershed Approach

The Watershed Approach provides the organizational framework for conducting scientific, engineering, and other technical work in the Management Program. Its goal is to focus efforts on the highest priority water quality issues of both surface and ground water. The Watershed Approach is a flexible framework for managing water quality and includes stakeholder involvement and management actions supported by sound science and appropriate technology. The approach also addresses water quality in a holistic manner (i.e., a manner that addresses all beneficial uses of the water body, the criteria needed to protect the use(s), and the strategies to restore water quality). The Watershed Approach is based on the following principles:

- geographic focus based on hydrology rather than political boundaries;
- water quality objectives based on scientific data;
- coordinated priorities and integrated solutions; and
- diverse, well-integrated partnerships.

For groundwater quality protection, the geographic focus is on aquifers rather than watersheds. Since aquifer boundaries do not follow watershed boundaries, a watershed may transect portions of several aquifers. Wherever interactions between surface and ground water are identified, management activities will support the quality of both resources. This approach is utilized with WPPs by integrating groundwater/surface water interactions into watershed characterization and selection of management measures, however, the management measures included in a WPP will generally not affect an entire aquifer.

The state applies the Watershed Approach to managing NPS pollution by channeling its efforts to restore and protect water quality through the development and implementation of WPPs and TMDLs in those watersheds where NPS pollution is contributing to a water quality impairment or concern.

The Watershed Approach recognizes that to achieve restoration of impaired water bodies, solutions to water quality issues must be socially accepted, economically bearable, and based on environmental goals (Figure 2.2).

Figure 2.2 Social, Economic, and Environmental Considerations to Achieve Water Quality Restoration

Clean Water State Revolving Fund

Another funding tool available in Texas to address NPS pollution is the Clean Water State Revolving Fund (CWSRF) which is administered by the TWDB. The CWSRF is a loan program authorized under the federal CWA and is capitalized by an annual grant from EPA. This program provides funding assistance in the form of 20 to 30 year loans at below market interest rates. The money from the loan payments is returned to the CWSRF to supplement the annual EPA capitalization grant for new loans. Although the majority of the loans are made to publically owned wastewater treatment and collection systems, the TWDB can also provide loans for NPS pollution abatement projects through the CWSRF. Loans can be made to towns, counties, GCDs, SWCDs, and other political subdivisions, as well as to private individuals and non-profit organizations. A water quality based priority system is used to rank potential applicants and fund projects with the greatest environmental benefits. Some of the activities that are eligible for funding include agricultural, rural, and urban runoff control; estuary

improvement; NPS education; and wet weather flow control including storm water and sewer overflows that are not associated with a Texas Pollutant Discharge Elimination System (TPDES) permit.

The TWDB has increased its efforts to identify potential applicants for loan projects that would address NPS-related water quality problems in the state. Staff from the TWDB, TCEQ, and TSSWCB, meet on a regular basis to coordinate efforts to identify water bodies which are impacted by NPS pollutants and identify potential applicants for CWSRF assistance. The TCEQ and TSSWCB provide input on funding needs from information gathered during the development of the IR, TMDLs, I-Plans, and WPPs. The TWDB uses this information during the development of its annual CWSRF Intended Use Plan and to focus its efforts to identify potential applicants for CWSRF funding assistance.

Partnerships for Conducting Work

The state uses the infrastructure of the CRP, SWCDs, river authorities, TGPC, CCAC, the universities, and other mechanisms to coordinate, develop, and implement the Management Program. These entities are each charged with certain water quality stewardship responsibilities and bring a great deal of experience related to research, assessment, laboratory analysis, and implementation and education activities. In addition, these entities conduct meetings and coordinate activities with a variety of local, regional, and state level stakeholders to pursue effective solutions to reduce or prevent NPS pollution.

Goals for NPS Management

The TCEQ and TSSWCB have established long- and short-term goals and objectives for guiding and tracking the progress of NPS management in Texas. The goals describe high-level guiding principles for all activities under the Management Program. The objectives specify the key methods that will be used to accomplish the goals. Success in achieving the goals and objectives will be tracked by a comprehensive suite of program performance measures, incorporated into the program to enhance accountability (Appendix E). Progress in meeting program performance measures are reported annually in the *Annual Report on Managing NPS Water Pollution in Texas*, which is submitted to EPA in accordance with CWA §319(h)(11).

The long-term goal will remain as long as NPS water pollution is an issue. Short-term goals will be reported annually. The TCEQ and the TSSWCB will evaluate the Management Program, on a biennial basis, to determine a need for revision and update the document every five years.

The programs discussed throughout this document implement the Management Program and achieve its goals and objectives. To facilitate coordination among essential programs, the goals are over-arching for all NPS programs implemented

by federal, state, regional, and local governmental entities and NGOs and citizens in Texas.

Long-Term Goal

Protect and restore water quality affected by NPS pollution through assessment, implementation, and education.

Objectives

1. Focus NPS abatement efforts, implementation strategies, and available resources in watersheds and aquifers identified as impacted by NPS pollution.
2. Support the implementation of state, regional, and local programs to prevent NPS pollution through assessment, implementation, and education.
3. Support the implementation of state, regional, and local programs to reduce NPS pollution, such as the implementation of strategies defined in TMDL I-Plans, WPPs, and other water planning efforts in the state.
4. Support the implementation of state, regional, and local programs to reduce NPS pollution to groundwater through the *Texas Groundwater Protection Strategy*, based on the potential for degradation with respect to use.
5. Support the implementation of state, regional, and local programs to reduce NPS pollution in the coastal management zone through the *Texas Coastal NPS Pollution Control Program*.
6. Develop partnerships, relationships, memoranda of agreement, and other instruments to facilitate collective, cooperative approaches to manage NPS pollution.
7. Increase overall public awareness of NPS issues and prevention activities.
8. Enhance public participation and outreach by providing forums for citizens and industry to contribute their ideas and concerns about the water quality management process.

Short-Term Goals

Goal One – Data Collection and Assessment

Coordinate with appropriate federal, state, regional, and local entities, and stakeholder groups to target water quality assessment activities in high priority, NPS-impacted watersheds, vulnerable and impacted aquifers, or areas where additional information is needed.

Objectives

Evaluate the condition of the state's waters, on a biennial basis, and prepare a report containing this evaluation, as required by CWA §305(b)

to determine: a) waters not meeting water quality standards due, at least in part, to NPS pollution, and b) the cause of the impairment or degradation.

A. Identify surface water bodies and aquifers from the IR and *Joint Groundwater Monitoring and Contamination Report* that need additional information to characterize non-attainment of designated uses and water quality standards.
B. Ensure that monitoring procedures meet quality assurance requirements and are in compliance with EPA-approved TCEQ or TSSWCB Quality Management Plans.
C. Conduct special studies to determine sources of NPS pollution and gain information to target water quality planning and BMP implementation.
D. Develop TMDLs, I-Plans, and WPPs to maintain and restore water quality in water bodies identified as impacted by NPS pollution.
E. Conduct monitoring to determine effectiveness of TMDL I-Plans, WPPs, and BMP implementation.

Goal Two – Implementation

Implement TMDL I-Plans and/or WPPs and other state, regional, and local plans/programs to reduce NPS pollution by targeting implementation activities to the areas identified as impacted or potentially degraded with respect to use criteria by NPS pollution.

Objectives

Prevent and reduce NPS pollutant loadings in surface water bodies, groundwater aquifers, wetlands, and coastal areas, through the execution of TMDL I-Plans, WPPs, the *Texas Groundwater Protection Strategy*, the *Texas Coastal NPS Pollution Control Program*, and other state, regional, and local plans.

A. Work with regional and local entities to determine priority areas and develop and implement strategies to address NPS pollution in those areas.
B. Develop and implement BMPs to address constituents of concern or water bodies not meeting water quality standards in watersheds identified as impacted by NPS pollution.
C. Develop and implement BMPs to address NPS constituents of concern in aquifers identified as impacted by or vulnerable to NPS pollution.
D. Implement TMDL I-Plans, WPPs, and other state, regional, and local plans developed to restore and maintain water quality in water bodies identified as impacted by NPS pollution.

Goal Three – Education
Conduct education and technology transfer activities to increase awareness of NPS pollution and activities which contribute to the degradation of water bodies, including aquifers, by NPS pollution.

Objectives
Through pollution prevention activities and education, reduce the amount of NPS pollutant loading entering the water bodies of Texas.

A. Enhance existing outreach programs at the state, regional, and local levels to maximize the effectiveness of NPS education.
B. Administer programs to educate citizens about water quality and their potential role in causing NPS pollution.
C. Expedite development of technology transfer activities to be conducted to increase BMP implementation.
D. Conduct outreach through the CRP, AgriLife Extension, SWCDs, and others to enable stakeholders and the public to participate in decision-making and provide a more complete understanding of water quality issues and how they relate to each citizen.
E. Implement outreach and education activities identified in the *Texas Groundwater Protection Strategy* to prevent NPS impacts to groundwater.
F. Implement outreach and education activities identified in the *Texas Coastal NPS Pollution Control Program* to prevent and abate NPS impacts to coastal resources.
G. Implement public outreach and education to maintain and restore water quality in water bodies impacted by NPS pollution.

Milestones

The Management Program identifies milestones at three levels to help track and report on success in achieving the goals and objectives described above. These three planning levels include: the statewide program, priority watersheds, and the project level. At the state level, milestones have been developed for program administration, the WAP process, and statewide education programs. In priority watersheds, program initiatives may include stakeholder participation, monitoring, modeling, and the development and implementation of TMDLs or WPPs. At the project level, schedules of deliverables are specified for individual project tasks in each approved scope-of-work. Milestones for the statewide program and priority watersheds are further defined below.

Statewide Program Milestones

Federal CWA §319(b)(2)(C) requires state management programs to include a schedule of annual milestones for the implementation of programs and practices to control NPS pollution. EPA's §319 guidelines require that EPA annually issue a

written determination that the state has made satisfactory progress during the previous fiscal year in implementing the NPS program. EPA requires schedules and milestones for determination of satisfactory progress and continued funding of the program, however, other documents and factors are typically utilized to assist with a determination of satisfactory progress. In addition to the state's Management Program and Annual Report, described in Chapter 1, EPA may consider other factors such as overall financial and grant progress, national program measures, mid-year and end-of-year reports, as well as interim meetings to discuss program issues across water programs, including CWA §319, in its determination of satisfactory progress of the Management Program.

Milestones have been defined for the *Texas NPS Management Program* and are presented in Table E.1 in Appendix E of the Management Program. These milestones represent progress in implementing the NPS program in Texas. Implementing the program and achieving the milestones support the achievement of the program goals and objectives. The milestones document program events, accomplishments, and project deliverables. Milestones provide a quantitative means to track progress in the program and to communicate this progress to stakeholders. An annual milestone schedule is also presented in Table E.1 in Appendix E of the Management Program. The schedule facilitates tracking the progress of the program over time. The NPS program will report on the progress in meeting milestones annually in the NPS Program Annual Report. Milestones identified in Table E.1 were estimated based on existing grant commitments.

EPA recognizes that achievement of goals and milestones are subject to potential changes in national funding levels, in addition to environmental and weather related factors, the national economic climate, and other variables beyond the control of the state. EPA and the state also recognize that changes to the goals and milestones can be influenced by revisions to national EPA guidance. Subsequently, the State may choose to re-evaluate and update applicable goals and milestones to adjust for such changing factors. This adaptive management approach will enable the state to make appropriate modifications to the Management Program to continue to attain satisfactory progress.

Nonpoint Source Program Administration - Milestones associated with the administration of the Management Program include the Grant Reporting and Tracking System (GRTS), the preparation of the Annual Report, filing financial reports required by federal grants, conducting an end-of-year meeting with EPA, and filing annual grant applications. These milestones are specified in individual grant conditions from EPA to TCEQ and TSSWCB and are reported according to appropriate grant procedures.

Watershed Action Planning Process - Milestones associated with the WAP process include watershed assessments, watershed and interagency planning meetings, and updates to the Priority Watersheds Report (discussed in Chapter 3). In general, this process occurs on an annual basis. Progress on the WAP will

be reported in the NPS Annual Report.

Education Program - Milestones for the statewide educational program relate to the activities of the Texas Watershed Steward Program, Texas Watershed Coordinator Roundtables, the Texas Watershed Planning Short Course, Texas Stream Team, and the Urban BMP Initiative. Activities are scheduled for these programs in consultation with collaborating entities.

Priority Watershed Milestones

Watershed programs are ongoing projects funded with §319(h) grants. These projects have activities scheduled in accordance with approved grant work plans. Specific program commitments are specified in these work plans and are reported according to appropriate grant procedures. Milestones for watershed programs are specified for the major project activities which are further described below.

Stakeholder Participation - Employ or develop a local watershed steering committee to encourage the participation of affected stakeholders in the decision-making process.

Water Quality Monitoring - Complete the assessment of pollutant problems by reviewing existing water quality data, conducting an inventory of point and nonpoint sources, land use data, and all known stressors influencing water quality. Complete water quality monitoring. Analyze data, assess loadings, and determine the origin and distribution of pollutants.

Modeling - Develop and apply models to determine numerical load allocations. Recommend control strategies for implementation.

Plan Development - Develop a detailed action plan (TMDL and I-Plan, or WPP) which establishes overall goals and objectives, load allocation, strategy for load allocation, timetable for implementation, and a list of expected results.

Implementation - Implement voluntary and regulatory action described in watershed plans and utilize adaptive management to adjust implementation based on follow-up verification monitoring of effectiveness.

Project Level Milestones

Projects funded with 319(h) grants have activities scheduled in accordance with approved grant work plans. Specific project commitments are specified in these work plans and are reported according to appropriate grant procedures.

Chapter 3 Watershed Action Planning

Texas is fortunate to have an abundance of natural resources, a large and growing population, and a robust economy. Water quality planning programs in Texas recognize the need for keeping the state's water resources safe for drinking, swimming, fishing, aquatic life, and other beneficial uses. It is a complex effort that requires collaboration among numerous parties. The large geographic expanse of the state, increasing demands on the state's water resources, changing federal policies, new technical issues, and the high expectations of Texans require that state water quality planning programs evolve to meet new challenges.

Water quality planning programs in Texas are responding to these challenges by developing new approaches to addressing water quality issues in the state. Watershed Action Planning is an approach that emphasizes the role of partners and stakeholders, relies on sound technical information, and makes available multiple options to provide the flexibility needed to address varied conditions.

WAP supports the integration of state water quality planning programs by providing a framework and a mechanism for an enhanced level of coordination. Participants in the WAP process consider water quality standards, monitoring data, remedial programs, and other water quality planning programs and how they relate to one another when developing an approach to addressing impaired waters. For example, it is essential to develop meaningful, yet attainable water quality standards. Remedial programs such as TMDLs cannot be successful if the water quality standards on which they are designed are not attainable. Similarly, water quality monitoring plays a critical role in establishing a link between management measures on the landscape and resulting water quality in-stream. This is an important means by which progress toward meeting the state's water quality goals is demonstrated. The goal of WAP is to implement an effective water quality planning program that optimizes resources, has the support of stakeholders, and is accountable and transparent to the citizens of Texas.

The Watershed Approach is a coordinated framework for environmental management that focuses public and private sector efforts to address the highest priority issues within hydrologically-defined geographic areas. Local stakeholders are encouraged to coordinate to develop and implement solutions that make good sense for the particular conditions found in their community.

The ultimate goal of the WAP process is to achieve restoration of designated uses in impaired water bodies. This can be accomplished by attaining socially accepted and economically bearable solutions based on environmental goals that are grounded in defensible water quality standards and supported by credible water quality data (Figure 2.2).

The WAP Process

WAP is a process designed to coordinate and track the state's water quality programs addressing water quality issues. The process emphasizes coordination by partners and stakeholders at both the watershed and state levels. An output of the WAP process is a list of impaired and special interest water bodies identifying a recommended approach to addressing the water quality issues. The WAP process involves three levels of coordination which are generally described below:

Local Watershed Prioritization - Meetings held in each river basin will be used to discuss issues associated with the impairments, concerns, and special interest waters in the basin. Water bodies on the IR in Categories 4 and 5, and special interest areas will be evaluated from the local perspective to document circumstances in the watershed and suggest WAP strategies. Watershed discussions may include the review of watershed maps, land uses, and known point and nonpoint sources of pollution. The categorization of water bodies in Texas is discussed later in Chapter 4 of this Management Program.

Program Integration - A workgroup of surface water quality program partners meet to discuss the water bodies identified on the IR as Categories 4 and 5, and special interest areas. This workgroup recommends updates to the WAP database based upon consideration of input received from the Local Watershed Prioritization meetings.

Statewide Interagency Coordination - At the statewide level, input will be sought from state and federal agencies and state level special interest NGOs that have an interest in the watershed strategies stated in the WAP database. Entities with available funds seeking projects that satisfy their funding criteria would also be invited to participate and leverage resources. Entities will discuss projects needed to implement the strategies identified in the WAP database. The strategies identified in the WAP database will be the basis that each partner agency and stakeholder will use for planning, budgeting, and implementing program activities as they relate to addressing impaired waters and other waters of interest in Texas. Those water bodies impacted by NPS pollution will be extracted from the WAP database and addressed by this Management Program.

The Role of Stakeholders

Stakeholder participation is an essential part of programs designed to address water quality issues. Stakeholder participation has become integrated into many state and local government programs. This section provides information to help define and identify stakeholders. It explains the importance of involving stakeholders early and sustaining their effort through the process. It also touches briefly on the need to provide suitable forums for stakeholder involvement. The stakeholder participation process used in the Texas water quality planning programs and the WAP process are described.

Who is a Stakeholder?

Stakeholders are those individuals who have an interest in a particular water quality issue, or may be affected by a related decision. Specifically, stakeholders can include all individuals or organizations with an interest in a watershed and have one or more of the following attributes:

- they live in the watershed or use the water resource;
- they are affected by water quality problems;
- they impact water quality;
- they have statutory or regulatory responsibilities closely linked to water quality;
- they may be required to undertake water quality control measures;
- they can help develop or implement actions to remedy water quality problems;
- they are affected by project outcomes or decisions;
- they have a financial interest in how the resource is managed; and
- they have an interest in the decision-making process.

Simply knowing the types of stakeholder does not always help to identify specific stakeholders. For example, stakeholders might include water skiers at an area lake, workers at a port in the lower reaches of a watershed, or the millions of people who eat fish and seafood every day. Landowners, in particular, often have multiple interests in water quality issues because the water body may be on or near their property. The following list and Table 3.1 provide examples of groups or categories of stakeholders:

- wastewater dischargers: municipal and industrial;
- the public: individuals; civic and other groups representing environmental, consumer, recreational, and community interests; schools and universities; and private landowners;
- agriculture, silviculture, and aquaculture: corporate and individual farmers, ranchers, and producers; commercial harvesters of fish and shellfish; agricultural groups and organizations; wildlife management associations;
- business: commercial and industrial firms, utilities, business groups, and trade associations; and
- government: people who represent citizens or are legally responsible for public resources, including federal, state, and local levels.

Table 3.1 Categories of Stakeholders

Stakeholder Category	Description	Examples
People who live, work, or play at or near a resource.	Those whose everyday lives and well-being are directly connected to a resource or issue. This group is essentially made up of the "neighbors" of the issue, and they should be invited to participate because their everyday lives may be impacted.	Residents, resource users, businesses, community/civic organizations, interest groups and NGOs, government, Native American tribes, and the media.
People interested in the resource, its users, its use, or its non-use.	Those who assign values to a resource and are concerned about the way the resources are used. This group includes those who extract value from resources, as well as those more interested in conserving or protecting resources. This group should be invited to participate because of the sheer interest in the resource or issue.	Businesses, resource users, interest groups and NGOs, community/civic organizations, government, and Native American tribes.
People interested in the processes used to make decisions.	Those deeply interested in the legal and procedural aspects of an issue. This group includes those who want to ensure that all relevant policies and procedures are observed in reaching a decision. They should be involved because of their attention to procedural detail and their ability to derail a process or litigate final decisions.	Interest groups and NGOs, government, the media, residents, and Native American tribes.
People who pay the bills.	Those whose money is directly or indirectly used to fund resource management through taxes, fees, and other means. This group wants to ensure that money is spent wisely and should be invited to participate because the government is accountable for how it spends public dollars.	Residents, resource users, businesses, and government.
People who represent citizens or are legally responsible for public resources.	Those who have the legal authority and obligation to manage natural resources. Members of this group want to ensure the best final decision is reached and should be invited to participate because it is their duty.	Government.

Adapted from Source: Meffe, Gary K., Larry A. Nielsen, Richard L. Knight, and Dennis A. Schenborn. 2002. *Ecosystem Management: Adaptive, Community-Based Conservation*. Island Press. Washington, D.C.

Stakeholder Participation in the Texas Water Quality Planning Programs

The water quality planning programs in Texas recognize the importance of stakeholder participation in the program and are committed to working with stakeholders to devise mutually acceptable strategies for achieving the state's water quality goals. There are a number of opportunities for stakeholder participation in the state water quality planning programs. Some examples are

listed below in Table 3.2.

Table 3.2 Stakeholder Participation in the Texas Water Quality Planning Programs

Water Quality Planning Program	Stakeholder Participation
Clean Rivers Program	Basin Steering Committees
Water Quality Standards	Surface Water Quality Standards Advisory Work Group and public comment on water quality standards revisions
Surface Water Quality Monitoring Program	Advisory Work Group for Surface Water Quality Assessment Guidance and public comment on the IR
NPS Management Program	Public comment on Management Program revisions; Management Program implementation at statewide and watershed levels
Total Maximum Daily Load Program	Project-specific stakeholder committees
Estuary Programs	Bay Councils

WAP and Stakeholder Participation

There is significant stakeholder participation in the individual state water quality planning programs (Table 3.2). The WAP process provides a framework to bring these individual initiatives together. Stakeholder participation in the WAP process will provide opportunities to contribute to the coordination of the individual program resources with the objective of achieving state program goals more effectively and efficiently. Figure 1.2 illustrates the WAP process. Questions and comments related to the WAP process can be raised at any of these forums.

Watershed Action Planning Strategies

The federal CWA requires that a TMDL be developed for all water bodies on the state's 303(d) list. The state established the TMDL program in 1998 at the TCEQ (formerly Texas Natural Resource Conservation Commission) and at partner agencies to facilitate the fulfillment of the state's obligations under the CWA. TMDL development activity was initiated in watersheds across the state as the primary strategy for addressing water quality impairments. Experience with the TMDL program since that time has shown that TMDLs may not always be the best choice to address water bodies on the state's §303(d) list. This has prompted the state to develop a new approach to addressing surface water quality impairments and other water quality issues.

The strategies identified for addressing surface water quality issues in the WAP process are listed below in Table 3.3. These strategies are implemented at a watershed scale utilizing the aforementioned Watershed Approach. The Watershed Approach provides a coordinating framework that focuses on the highest priority issues within a hydrologically defined geographic area.

Table 3.3 Watershed Action Planning Strategies

Strategy	Strategy Description
Monitoring	More data is needed in order to determine the severity and/or area of the impairment before determining the most appropriate restoration activity.
Evaluation	A more comprehensive, site-specific analysis than the one conducted for the IR is required.
WQS Review	Evaluate the appropriateness of the designated use or criterion.
TMDL/I-Plan	A TMDL and I-Plan determine the assimilative capacity, allocate loads, and identify the actions necessary to achieve water quality standards.
WPP	A WPP coordinates water quality protection programs and projects designed to meet water quality standards.
Other	The impairment cannot be addressed by one or more of the other identified strategies.

The WAP process includes a stakeholder-led evaluation of watershed-specific circumstances and a deliberative and collective decision as to how to address the water quality issues. The WAP process will also be used to evaluate the effectiveness of strategies. Progress in implementing strategies will be reviewed through the WAP process and appropriate actions will be recommended. The goal of this increased flexibility and stakeholder participation in the planning process is more effective and efficient water quality planning programs.

The WAP Database

The WAP process will utilize relevant information from existing planning tools within the state water quality planning programs to develop a database that will document and track management strategies for impaired and special interest waters in the state. Currently the database is in the form of a spreadsheet. The WAP database will be maintained by TCEQ. The following information will be included in the database:

- the segment;
- the impairment or priority interest;
- the date the water body was first listed on the §303(d) List;
- what will be done to address the water quality issue (i.e., which strategy will be applied);
- responsible agency/program area;
- the timeline for completion of the strategy; and
- progress reports from lead entities.

WAP increases the transparency of the state's water quality planning programs by presenting the list of priority waters in such a manner as to communicate activities and intentions collectively to affected stakeholders and the public at large.

NPS Priority Watersheds Report

Priority surface waters for the Management Program are identified in the NPS Priority Watersheds Report included as Appendix C of the Management Program. Appendix C is an outcome of the WAP process. It identifies water quality issues in the state which are caused by NPS pollution. Appendix C also provides the strategies that are proposed or being undertaken to address nonpoint sources of pollution, and the lead agency. The NPS Priority Watersheds Report is critical to the CWA §319(h) grant program. It provides the necessary foundation for project planning and development prior to annual requests for proposals or applications. As illustrated in Figure 3.1, the NPS Priority Watersheds Report offers §319 grant applicants the basis to plan, scope, and coordinate the development of projects that execute respective watershed strategies. TSSWCB follows a similar grant development process on a different timeline. In short, the WAP process and respective NPS Priority Watersheds Report improves the coordination and resource leveraging necessary to achieve the long- and short-term goals of the Management Program.

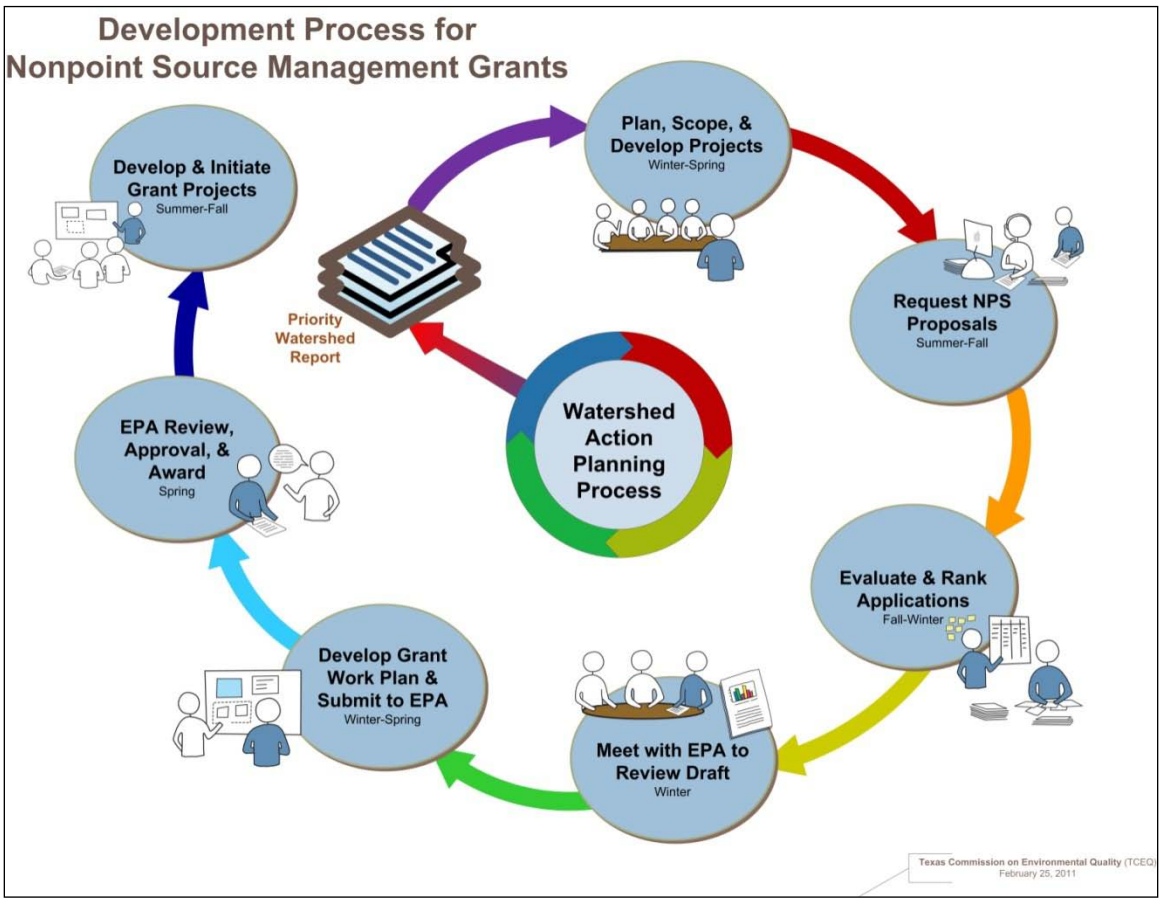

Figure 3.1 TCEQ NPS Grant Development Process
*TSSWCB follows a similar grant development process on a different timeline

In addition to the WAP process, watersheds and water bodies that will be targeted/prioritized for funding under the Management Program for the

upcoming planning period will include current projects and those which meet prioritization criteria set in annual grant solicitations.

Milestones associated with implementing the WAP process and generating the Priority Watersheds Report include watershed assessments, watershed and interagency planning meetings, and updates to the Priority Watersheds Report. In general, the assessments and planning meetings occur on an annual basis and the update to the Priority Watersheds Report will occur at least on a biennial basis.

WAP is a dynamic priority-setting process culminating in decisions on specific strategies for water bodies. As this Management Program is an element of the state's WQMP, the state will use the mechanisms employed by TCEQ to update the WQMP in order to publish revisions to Appendix C of this Management Program (i.e., the NPS Priority Watersheds Report).

Groundwater Constituents of Concern Report

The Management Program utilizes multiple methods for identifying and addressing NPS groundwater issues. The methods utilized in Texas include:

- Texas IR;
- aquifer vulnerability ranking;
- TGPC recommendations and reports, including:
    - *Joint Groundwater Monitoring and Contamination Report*
    - *Texas Groundwater Protection Strategy*
    - *State Management Plan for the Prevention of Pesticide Contamination in Groundwater*
    - subcommittee recommendations; and
- special programs and priorities identified by Texas GCDs.

The list of groundwater constituents of concern presented in Appendix D (Table D.1) is based on the 2010 Texas Water Quality Inventory groundwater monitoring data in which constituents exceed the MCL for drinking water requirements for one or more wells. Additionally, the vulnerability ranking for major and minor aquifers in Texas, as determined through the DRASTIC methodology, is provided in Appendix D, (Table D.2). Aquifer vulnerability rating is a mechanism used to identify aquifers that may be susceptible to impacts from surface activities. Texas has used the DRASTIC methodology for many years. DRASTIC values have been incorporated into many of the rules of TCEQ's regulatory programs for establishing the relative vulnerability of aquifers to contamination. The Appendix D tables provide general water quality concern information for aquifers in the state.

Funds are limited for addressing NPS groundwater issues in Texas. Additionally, it is recognized that the Appendix D lists do not identify localized issues. Therefore, §319(h) grant funds often are targeted to address localized NPS

pollution issues and prevention. These areas are identified through the TGPC and other stakeholders, in addition to statewide and regional efforts.

A particular focus for targeting efforts is water quality protection practices in outcrop portions of aquifers where NPS pollution is a greater risk due to recharge, or surface water infiltration of the aquifers. The focus of groundwater/surface water interactions may also be addressed in other activities as stakeholders and project leaders identify these hydrology features and areas as significant concerns. Since groundwater contamination can remain latent for a lengthy period of time, and since groundwater is difficult to remediate once it has become impacted, the majority of Texas groundwater programs focus on prevention of contamination, rather than remediation. This is true of point source regulatory and permitting programs, as well as NPS-related programs like the Pesticides in Groundwater Program conducted under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) by TCEQ. Therefore, the Management Program emphasizes the prevention of NPS pollution in groundwater.

Chapter 4 Water Quality Management Cycle

In order to protect water quality, the state must define and measure it, identify the types and sources of pollution, and implement plans to protect, maintain, and restore it. The state of Texas uses a dynamic, flexible cycle of activities to manage water quality. Implementing this cycle of activities involves coordination between many different entities and programs around the state of Texas. As illustrated in Figure 4.1, steps in the cycle are identified and discussed in this chapter. The steps in the cycle include:

- **Planning**: setting standards for surface water quality and revising or formulating monitoring plans;
- **Monitoring**: collecting data to monitor the condition of surface and ground waters;
- **Assessment**: assessing data to determine water quality status and to identify impairments and utilizing the WAP process to target resources;
- **Strategy Development**: utilizing the Watershed Approach for protecting, improving, or restoring water quality with pollutant source controls and practices; and
- **Implementation**: employing pollution controls for both point and nonpoint sources and outreach/education programs, and evaluating progress. Evaluations may lead back to revising those plans or formulating new ones.

Figure 4.1 The Water Quality Management Cycle

Planning

Water quality standards are the foundation for managing surface water quality under the CWA. Standards define the water quality-related goals for a water body.

A water quality standard is the combination of:

> Uses - A use that can be reasonably achieved by a water body in accordance with its physical, biological, and chemical characteristics whether it is currently meeting that use or not. Typical uses that may be designated for specific water bodies include domestic water supply, categories of aquatic life use, recreational categories, and aquifer protection. Uses may be existing, designated, presumed and/or attainable.
>
> Water Quality Criteria - Water quality conditions that are to be met in order to support and protect uses. The Texas Surface Water Quality Standards (TSWQS) contain both numeric and narrative criteria for a variety of parameters. Specific parameters and criteria are associated with certain uses.

The federal CWA and associated EPA rules require states to review, and, if appropriate, revise surface water quality standards at least every three years. The rulemaking process to revise the TSWQS includes public participation. State water quality standards must be approved by EPA in order for them to be used for federal permitting programs and other CWA purposes. The TSWQS are set forth in 30 TAC Chapter 30, §307. They define desired uses for surface waters in the state, and appropriate in-stream numeric and narrative criteria to protect those uses. Standards define the goals for water quality and provide the basis for permitting, assessment, and restoration targets for managing point and nonpoint source loadings in Texas surface waters. The TSWQS recognize the regional and geologic diversity of the state. The standards also define an antidegradation policy that protects existing uses and the state's highest quality waters.

The TCEQ is the lead agency in the state responsible for establishing and revising standards to protect surface water quality in accordance with CWA §303(c). TWC, §26.023 provides that the TCEQ is the sole and exclusive authority to make rules setting water quality standards for all waters in the state. The TWC stipulates that the state may amend the standards from time to time. The TCEQ Water Quality Standards Group is responsible for establishing and revising standards to protect surface water quality.

Water Quality Uses

Some standards are applied generally to many different water bodies, while some

are site-specific. Typical uses that may be designated for specific water bodies include domestic water supply, categories of aquatic life use, and recreational categories. Any one water body will usually have multiple uses designated. For example, a lake or stream may be designated for use as a source of drinking water, for recreation, and as a healthy environment for fish and other aquatic organisms.

The standards assign site-specific uses for most medium to large water bodies, and general uses for all water bodies. Each use defined in the standards has associated criteria that are used to evaluate whether water quality is sufficient to maintain those uses.

Aquatic Life Use

This use is designed to protect aquatic or aquatic-dependent animal species that live in and around the water. This use establishes optimal conditions for the support of aquatic life and defines indicators used to measure whether these conditions are met. This use has several tiers: exceptional, high, intermediate, limited, and minimal. Some pollutants or conditions that may jeopardize this use include low levels of dissolved oxygen, toxic substances such as metals or pesticides, or excess turbidity.

Recreation

These standards are designed to ensure that water is safe for swimming and other water recreation activities that involve significant risk of ingestion of water. Recreational use consists of four categories - primary contact recreation, secondary contact recreation 1, secondary contact recreation 2, and noncontact recreation. Classified segments are designated for primary contact recreation unless sufficient site-specific information demonstrates that elevated concentrations of indicator bacteria frequently occur due to sources of pollution that cannot be reasonably controlled by existing regulations, wildlife sources of bacteria are unavoidably high and there is limited aquatic recreational potential, or primary or secondary contact recreation is considered unsafe for other reasons such as ship or barge traffic.

Domestic Water Supply

Domestic water supply consists of three subcategories: Public Water Supply, Sole-Source Surface Drinking Water Supply, and Aquifer Protection.

Public Water Supply

This use is intended to protect water from a lake or river that is suitable for use as a source for a public water supply system. Source water is treated before it is delivered to the tap and must meet a separate set of standards established for treated drinking water through the federal Safe Drinking Water Act. Indicators

used to measure the safety or usability of surface water bodies as a source for drinking water include the presence or absence of substances such as metals or pesticides. Concentrations of salts, such as sulfate or chloride, are also measured, since treatment to remove high levels of salts from drinking water is expensive.

Sole-Source Surface Drinking Water Supply

Water bodies that are sole-source surface drinking water supplies are listed in Appendix B of the TSWQS. Sole-source surface drinking water supplies and their protection zones are addressed in 30 TAC Chapter 321,Subchapter B: Concentrated Animal Feeding Operations.

Aquifer Protection

The designation for aquifer protection applies only to those designated portions of the segments that are on the recharge zone, transition zone, or contributing zone of the Edwards Aquifer. This use is discussed in 30 TAC Chapter 213. Segments designated for aquifer protection are capable of recharging the Edwards Aquifer. The principal purpose of this use designation is to protect the quality of water infiltrating and recharging the aquifer.

Oyster Waters

This use assures that oysters or other shellfish in marine waters that may accumulate bacteria from the water are safe for commercial harvest, sale, and consumption by the public.

Water Quality Indicators

Specific indicators of water quality such as bacteria, dissolved solids, and organics are also described in the standards. Specific numeric and narrative criteria are assigned to these indicators, or parameters, for the various uses. Several different parameters may be measured to determine whether a water body meets its designated uses. Some of the most common are listed here, with an explanation of why they are important to the health of a water body.

Escherichia coli (E. coli), and Enterococci Bacteria

These indicators measure the level of certain indicator bacteria in water. Indicator bacteria, although not generally pathogenic, are indicative of potential contamination by feces of warm-blooded animals. Criteria associated with these indicators are used to assess the relative risk of swimming or other water recreational activities. These bacteria are found in the waste of warm-blooded animals. Their presence may indicate that pathogens also in these wastes may be reaching a water body from sources, such as, inadequately treated sewage, improperly managed animal waste from livestock, pets in urban areas, wildlife, or failing septic systems.

Dissolved Oxygen and Nutrients

The concentration of dissolved oxygen is a single, easy-to-measure characteristic of water that positively correlates with the abundance and diversity of aquatic life in a water body. A water body that can support diverse, abundant aquatic life is a good indication of high water quality. However, highly variable dissolved oxygen concentrations may indicate a related problem associated with an excess of nutrients (nitrogen and phosphorus) in water. High concentrations of nutrients in water may stimulate excessive growth of vegetation which may result in very high dissolved oxygen concentrations during the day and very low dissolved oxygen concentrations at night. These conditions may have a negative impact on aquatic life use.

Dissolved Solids

High levels of dissolved solids, such as chloride and sulfate, can cause water to be unusable, or simply too costly to treat for drinking water use. Changes in dissolved solids concentrations also adversely affect the water quality for aquatic life use.

Metals

Concentrations of metals can pose a threat to aquatic life, drinking water supplies, and human health. Eating fish contaminated with toxic metals can result in these substances accumulating in tissue, posing a risk to human health. Potentially dangerous levels of metals are identified through chemical analysis of water, sediment, and fish tissue.

Organics

Toxic substances from pesticides and industrial chemicals, called organics, pose the same concerns as toxic metals. Polychlorinated biphenyls (PCBs), for example, are industrial chemicals that are toxic and suspected carcinogenic. Although banned in the United States in 1977, PCBs, like other organics, remain in the environment, and they accumulate in fish and human tissues when consumed. Potentially dangerous levels of toxic substances are identified through chemical analysis of water, sediment, and fish tissue.

Fish Consumption Advisories and Closures

The Texas Department of State Health Services (DSHS) conducts chemical testing of fish tissue to determine whether there is a risk to human health from consuming fish or shellfish caught in Texas streams, lakes, and bays. Fish seldom contain levels of contaminants high enough to cause an imminent threat to human health, even to someone who eats fish regularly. Risk increases for those persons who regularly consume larger fish and predatory fish from the same area of contaminated water over a long period of time. When a fish consumption advisory is issued, a person may legally take fish or shellfish from the water body under the advisory, but should limit how much fish he or she eats, and how often. When a fish consumption closure is issued, it is illegal to take fish from the water body.

Classified Waters

Classified waters are designated in Appendix A of the TSWQS. Classified segments have designated uses (such as recreation, aquatic life, and water supply) and criteria associated with those uses (such as dissolved minerals, dissolved oxygen, pH, bacteria, and temperature). The designated uses and associated criteria for classified segments are also listed in Appendix A. The segment descriptions that define the geographic extent of the classified segments are listed in Appendix C of the TSWQS. A map of classified stream segments is illustrated below in Figure 4.2.

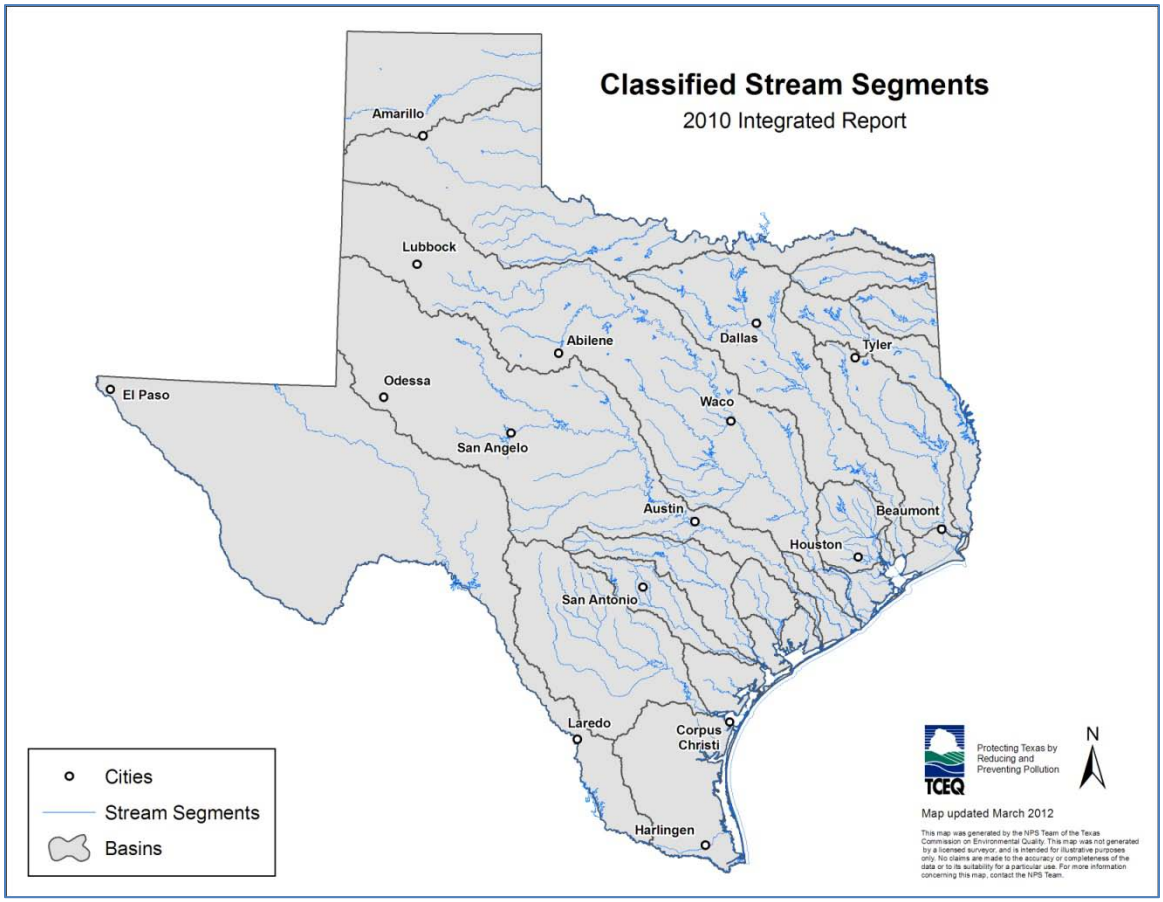

Figure 4.2 Classified Stream Segments

The major surface waters of Texas have been divided into classified water segments. Most of the larger perennial (always flowing) rivers in the state, major reservoirs, and estuaries with large areas, are classified. A single river may consist of several classified segments. The term segment refers to a defined, basic unit for assigning site-specific standards, and is intended to have relatively common biological, chemical, hydrological, and physical characteristics. Segments will also normally exhibit common reactions to external stresses such as discharges or pollutants. The establishment of segments facilitates planning activities, issuance of permits, and allocation of grant funds necessary to implement various sections of the federal CWA.

Unclassified Waters

Unclassified waters are those smaller water bodies that are not designated as segments in Appendix A of the TSWQS. Certain unclassified water bodies are listed in Appendix D of the TSWQS. These are water bodies where sufficient information has been gathered to assign an aquatic life use and associated dissolved oxygen criterion. Water bodies listed in Appendix D are not designated as classified segments. Unclassified water bodies not included in Appendix D are typically assigned presumed uses, such as a presumed aquatic life use.

Water Quality Standards Review

The CWA provides a process for evaluating the water quality standards if there is reason to believe that one or more of the uses and/or criteria may be inappropriate because of local conditions that are not due to human impacts. Waters in this category (5b) are slated for a review of their standards, called a use attainability analysis (UAA). As described in Chapter 3, the WAP process seeks stakeholder input on strategies such as water quality standards reviews.

Use Attainability Analyses

TCEQ uses the Watershed Approach to address water quality. As part of this approach, it is essential to develop appropriate water quality standards that reflect a water body's ability to attain criteria due to natural water quality conditions. UAAs are one of the tools TCEQ uses to identify and assign appropriate standards. TCEQ has developed procedures for aquatic life UAAs and recreational UAAs.

An aquatic life UAA is conducted to establish or change an assigned aquatic life use or dissolved oxygen criteria by studying the physical, chemical, and biological characteristics of the water body. Aquatic life UAAs are often initiated on individual water bodies (classified or unclassified) when the existing standards appear to be inappropriate for water bodies that are identified on the §303(d) List as impaired, or that are potentially affected by permitted wastewater discharges or other permitting actions. These studies often rely on the expertise of local water quality professionals from river authorities, TCEQ regions, and Texas Parks and Wildlife Department (TPWD) staff to collect the information necessary to assign appropriate aquatic life uses and dissolved oxygen criteria.

Recreational use attainability analyses (RUAAs) are conducted to collect information needed by TCEQ to assign the most appropriate contact recreation use and indicator bacteria criterion. Such information includes the presence or absence of water recreation activities, stream flow type and stream depth. This information is used by TCEQ to verify a presumed use or provide detailed information to establish a site specific recreational criterion. Input from local

stakeholders, including citizens who live near or adjacent to the water body, is considered heavily by TCEQ. Water quality professionals from river authorities, TCEQ regions, TPWD, and the TSSWCB are solicited for feedback prior to the initiation of a study, to determine if an RUAA is an appropriate water quality management strategy to address a water quality problem. Once an RUAA is initiated, local meetings are held in the watershed to notify stakeholders and incorporate their feedback to further develop the study design. Interviews from local citizens familiar with the water body are used by TCEQ to document past and present recreational activities occurring on the water body. Stakeholders also play an important role in providing comments on draft study reports.

An aquatic life or recreational UAA can result in the addition, removal, modification, or retainment of a use. Uses may be modified when it can be demonstrated, through a UAA, that attainment of the current uses and/or criteria is not possible due to local water quality conditions. Conversely, a UAA might demonstrate that the current uses and criteria are appropriate, or even that they should be more stringent. UAAs and use designations are part of the surface water quality standards and are available for public comment after they are proposed by TCEQ. Once formally adopted, they are reviewed by EPA and must be approved prior to use in TCEQ water quality management activities.

Monitoring

Water quality data are gathered regularly to monitor the condition of the state's surface waters. Chemical, physical, biological, hydrologic, and hydraulic data are collected by the TCEQ, the regional agencies of the CRP, and other organizations, such as state and federal agencies, municipalities, educational institutions, volunteer monitoring groups, and private organizations under contract by the state. Monitoring plans are guided by quality assurance project plans (QAPPs) that ensure that data are collected according to generally accepted practices and are of sufficient quality to be used in making defensible scientific assessments and management decisions.

The TCEQ's Surface Water Quality Monitoring (SWQM) Program is coordinated by the SWQM Team and by staff in the TCEQ's 16 regional offices. Routine monitoring and special studies are conducted by SWQM personnel. This program is also responsible for the maintenance of the statewide continuous water quality monitoring network (CWQMN) which is used to evaluate water quality real-time at specific locations.

Texas conducts five main types of data collection to monitor the status of water bodies:

- routine monitoring;
- systematic monitoring;
- targeted monitoring;
- permit support monitoring; and

- effectiveness monitoring.

Routine monitoring is designed to assess the status and trends of overall water quality throughout the state, and for each river basin. Data are collected on a regular basis using a monitoring network of key sites on the major water bodies in each basin. Monitoring sites may also include smaller water bodies to support characterization of ecoregions and/or basin-specific conditions.

Systematic monitoring focuses on evaluating subwatersheds and unclassified water bodies. The purpose of this monitoring is to investigate and detect areas of concern, and isolate issues that require further study. It also includes monitoring at sites to check the status of water bodies (identify improvements or concerns). This monitoring strategy distributes resources throughout the river basin to gather information on water bodies that would not normally be included in the routine monitoring program.

Targeted monitoring is conducted on water bodies where there is reason to believe there is a threat or a concern for water quality, to establish the extent and degree of an impairment, or to determine the best strategy for restoring water quality. Sometimes called special studies, targeted monitoring activities usually involve intensive periods of data collection at sites where routine or systematic monitoring identified impacts, concerns, or impaired uses.

Permit support monitoring is used to address specific areas where additional information is needed to support the development of permits that allow wastewater discharges. This may include studies to gather site specific information used in drafting permits.

Effectiveness monitoring is conducted to evaluate whether management practices, regulatory measures, and watershed improvement and restoration plans are producing the desired results. The data from these studies are evaluated for trends that represent improving water quality due to implementation practices.

Coordination

The Texas CRP and SWQM Program play key roles in the TCEQ's yearly integration of these various monitoring needs into a coordinated monitoring schedule for the entire state. The schedule shows all surface water monitoring being conducted by the TCEQ or under its contracts or cooperative agreements for each planning year.

Planning and development of the coordinated monitoring schedule takes place from January through May preceding the state fiscal year for which the plan is developed. To support coordinated monitoring, the TCEQ has developed guidance for selecting sites and for sampling methods for routine, systematic, and targeted monitoring. The coordinated monitoring schedule is hosted by the Lower Colorado River Authority (LCRA), a CRP Partner Agency, on its Web site

at *http://cms.lcra.org/*.

Clean Rivers Program

The CRP is a collaboration between regional water agencies in the state and the TCEQ. The CRP works to provide data so that watershed management decisions are based on scientifically valid and complete assessments of water quality conditions, and the contributing causes of impact. Water bodies are selected for priority monitoring considering the importance of the resource, risk from pollution, and input from the stakeholders. Monitoring activities include routine monitoring, systematic monitoring, permit support monitoring, and special studies.

The TCEQ works in partnership with the CRP to set regional priorities for protecting and improving the state's surface waters. The CRP brings together state, regional, and federal agencies to:

- eliminate duplication in monitoring surface water quality and thereby leverage resources;
- support data sharing and quality assurance by creating uniformity in methods;
- establish regional stakeholder forums to involve the public in identifying, prioritizing, and managing local water quality issues;
- set priorities and schedules for monitoring; and
- identify problems and preventive or remedial measures.

To support those goals and the TCEQ's overall water quality management program, the CRP's long-term action includes nine key methods:

- ensure efficient use of public funds;
- enhance public participation and outreach;
- encourage comprehensive and cooperative watershed planning;
- maintain basin-wide water quality monitoring programs;
- develop and maintain a river basin water quality database clearinghouse;
- provide quality-assured data to the TCEQ for use in water quality decision-making;
- focus on priority issues and address local initiatives;
- identify, analyze, and report on water quality issues and potential causes of pollution; and
- identify and evaluate alternatives for preventing and reducing pollution.

Monitoring

The development of the annual coordinated monitoring schedule is an exceptional example of stakeholder involvement. Monitoring priorities and issues are discussed among state, federal, regional, and local governmental entities as well as other interested parties and the public. The implementation of coordinated statewide monitoring is a priority of the TCEQ and the CRP to

minimize duplication of effort, improve spatial coverage of monitoring sites, and improve consistency of parametric coverages (parametric coverages typically include field measurements, flow measurements, routine water chemistry, and indicator bacteria analysis).

At least one meeting is held in each major river basin, hosted by the CRP Partner Agency, during the spring of each year. The purpose of the meeting is to develop a basin-wide coordinated monitoring schedule. All water quality monitoring groups that collect SWQM data and commit to comply with TCEQ requirements for collecting quality-assured data are invited to participate. New sites are added, existing sites may be relocated, and parametric coverages may be changed based on the discussions at the meetings.

The preliminary basin-wide monitoring schedules developed at the coordinated monitoring meetings are reviewed by the CRP Partner Agencies, CRP stakeholders, and TCEQ staff to ensure that proposed revisions to monitoring locations and parametric coverages are appropriate. After review, a statewide coordinated monitoring schedule is posted on the internet developed and maintained under contract by the Lower Colorado River Authority (LCRA) at: *http://cms.lcra.org/*.

Basin Highlights and Summary Reports

A Basin Highlights Report, is produced by each regional water quality authority, and provides an overview of water quality issues and the status of ongoing projects/tasks. A detailed and in-depth data analysis is provided for each basin in the Basin Summary Report once every five years. This report provides trend analysis, spatial analysis (correlating environmental factors to water quality), an explanation for why certain water quality issues exist, and recommendations for addressing persistent water quality problems. The CRP strives to report water quality data in a user-friendly format to inform the public. The information contained in these reports is utilized by the TCEQ in the development of the IR, subsequent statewide rankings, and prioritization of management strategies.

Basin Steering Committees

Basin steering committees of the CRP provide the primary forum for coordinating stakeholder involvement at the regional level. These committees carry out educational activities within the basin, such as workshops and volunteer programs. They also produce public information products and conduct promotional campaigns through various media.

CRP Basin Steering Committees generally meet at least annually in each of Texas' major river basins. The purpose of these meetings is for the CRP Partner Agency to present water quality issues for the basin and request input from the local citizens and stakeholders in identifying potential sources of pollution and setting local priorities. In addition, the meeting provides a way for state agency representatives to communicate statewide NPS goals to stakeholders at the local level. The CRP Partner Agency responsible for monitoring and assessing water

quality for each basin plans and conducts the meeting. Basin status reports prepared by the CRP Partner Agencies outline recommended actions for NPS pollution management and other water quality issues in each river basin.

Clean Rivers Program Stakeholders Work Group

Comprised of staff from the regional planning agencies of the CRP, the work group represents stakeholder interests at the state level. The CRP Stakeholders Work Group coordinates with the TCEQ and other state agencies at annual meetings. The Stakeholder Workgroup meets annually to ensure the CRP is functioning in a manner that considers the needs of all stakeholders. Representatives from government, industry, business, agriculture, and environmental interest groups participate in the Work Group. Surface water quality issues are discussed, and decisions are made through a consensus-based approach.

The Stakeholder Work Group was originally formed solely as an advisory group for the CRP. However, in recent years the Work Group's scope and membership has been expanded to include input on the focus, goals, and functionality of the Management Program, the TMDL Program, and the SWQM Program. The group also works with the TCEQ on setting priorities for addressing water quality problems related to both point and nonpoint sources.

United States Geological Survey

The United States Geological Survey (USGS) also conducts a large amount of monitoring statewide and much of the data are utilized by the TCEQ. The USGS surface water collection network in Texas is primarily established to monitor stream flow continuously at many permanent sites. Field measurements, routine water chemistry, and metals in water are also collected at many of the fixed sites. Sites are chosen to represent a mix of natural and human factors that influence water quality. Chemical variables are then related by the USGS to hydrologic conditions to interpret water resource conditions and meet water quality management needs. Estimation of point and nonpoint source loadings, storm water management, and chemical-contaminant controls are some of those needs.

Groundwater Quality Monitoring

The TWDB has the responsibility for collecting and maintaining an inventory of ambient groundwater conditions throughout the state. The TGPC relies upon ambient monitoring data from the TWDB for state groundwater quality information. The TWDB performs ambient groundwater monitoring on water wells in a particular number of Texas aquifers each year, so that all major and minor aquifers of the state are monitored approximately every five years. The TWDB maintains a database of ambient groundwater monitoring data for the state from over 51,000 water wells and is supplemented by data from the USGS, the Bureau of Economic Geology (BEG), and the TCEQ. In addition, many GCDs

throughout the state have well-developed monitoring programs. These programs are primarily intended to monitor the volume of water in an aquifer, but may also collect groundwater quality information in some cases. Data are maintained by the GCD, and generally reported to the TWDB for inclusion in their ambient groundwater database.

Major aquifers, as illustrated in Figure 4.3, are defined as producing large quantities of water in a comparatively large area of the state, whereas minor aquifers produce significant quantities of water within smaller geographic areas or small quantities in large geographic areas.

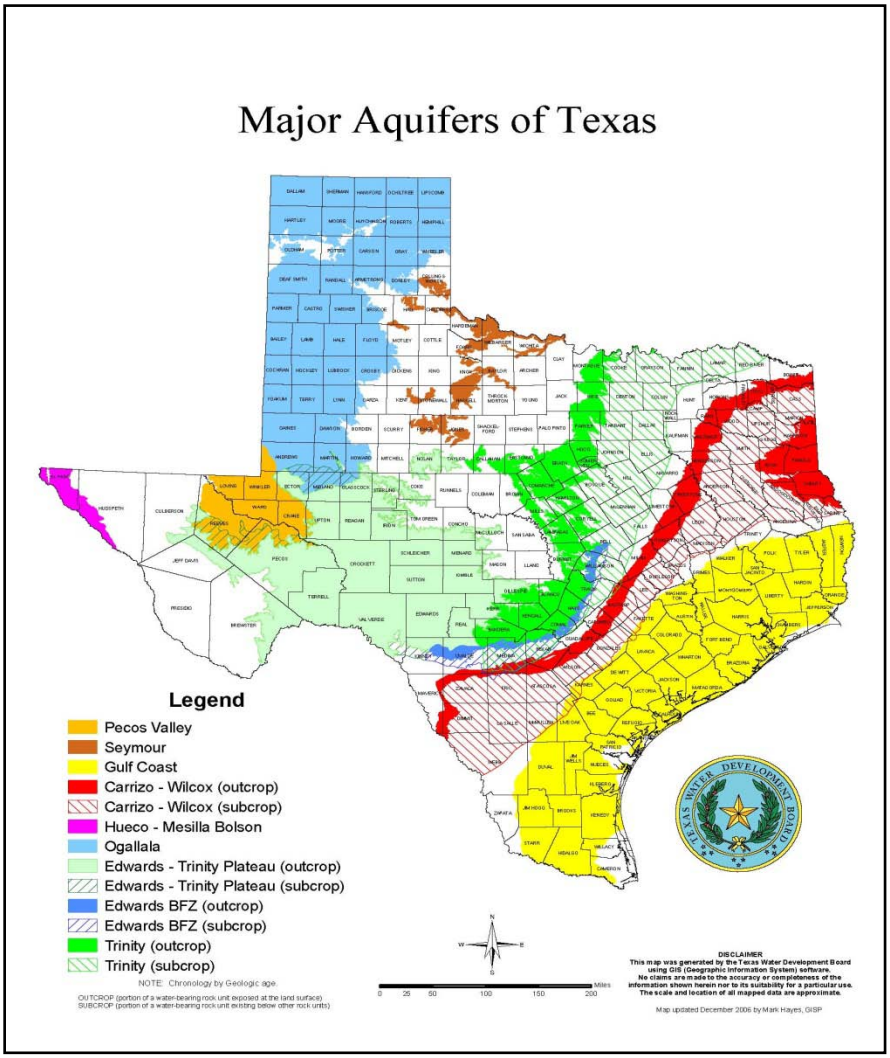

Figure 4.3 Major Aquifers of Texas

Groundwater supplies about 59% of all water used by Texans for domestic, municipal, industrial, and agricultural purposes. Approximately 36% of the water used for municipal supplies, and 79% of the water used for agricultural purposes is obtained from groundwater sources. In addition, more than 99% of all rural drinking water in Texas is supplied by groundwater. This groundwater is

produced from aquifers, which are underground layers of rock with water stored in pore spaces, cracks, or voids.

Minor aquifers, as illustrated in Figure 4.4, are very important as they may constitute the only significant source of water supply in some regions of the state. Nine major aquifers and 21 minor aquifers have been delineated within the state. These major and minor aquifers underlie approximately 76% of the state's surface area. Other undifferentiated, local aquifers may represent the only source of groundwater where major or minor aquifers are absent. These local aquifers, which provide groundwater that is used for all purposes, vary in extent from very small to several hundred square miles.

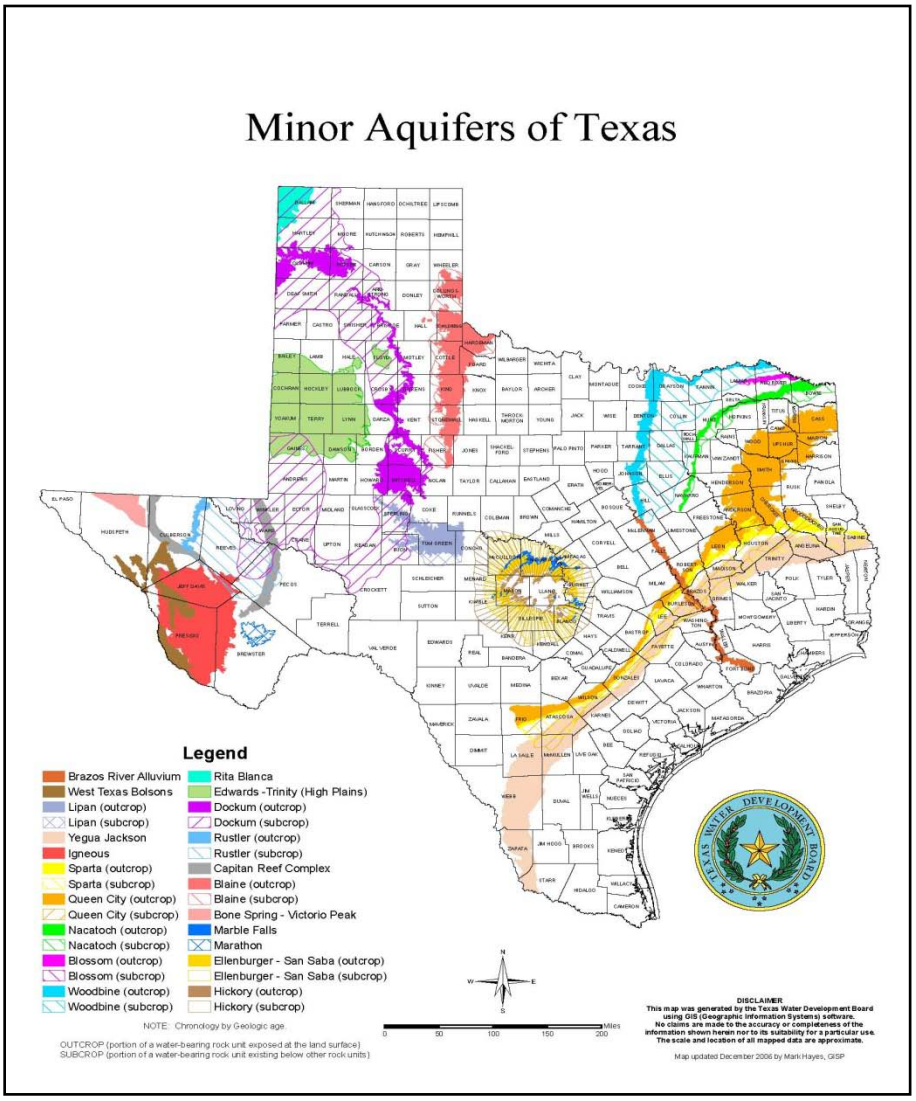

Figure 4.4 Minor Aquifers of Texas

Measuring Groundwater Quality

The TWDB is authorized by the TWC to conduct studies and map the state's water resources. The TWDB has identified the state's aquifers, and delineated the

boundaries of major and minor aquifers based on yields and significance of aquifer production. These maps (Figures 4.3 and 4.4) depict the extent of each aquifer, including where it is exposed at the surface, which is commonly where recharge occurs, as well as, the portion of the aquifer underground. For most aquifers, a Total Dissolved Solids (TDS) concentration of 3,000 milligrams per liter (mg/L) is used to mark the boundary of usable quality water when mapping aquifers. The boundary of the Edwards Aquifer, for mapping purposes, is defined by a TDS concentration of 1,000 mg/L.

TDS are constituents in groundwater dissolved from the surrounding rock and are the basis for the TGPC groundwater classification system (Table 4.1). Under this groundwater classification system, four classes are defined based on quality as determined by TDS concentration. Through classification, groundwater can be categorized, and protection or restoration decisions can be made according to the water quality present or potential use of the groundwater.

Table 4.1 TGPC Groundwater Classification System

CLASS	QUALITY*	EXAMPLES OF USE
Fresh	Zero to 1,000	Drinking and all other uses
Slightly Saline	More than 1,000 to 3,000	Drinking (if freshwater is unavailable), livestock watering, irrigation, industrial, mineral extraction, oil and gas production
Moderately Saline	More than 3,000 to 10,000	Potential/future drinking and limited livestock watering and irrigation (if fresh or slightly saline water is unavailable); industrial, mineral extraction, oil and gas production
Very Saline to Brine	More than 10,000	Mineral extraction, oil and gas production

* Concentration range of TDS in mg/L

Other Sources of Data

Additional data from other state and federal agencies, cities, and other monitoring groups can be assessed in the evaluation of water quality if the data meet clearly defined acceptance and time line criteria established by the TCEQ. Previous contributors of data of this type include the DSHS, TPWD, TSSWCB, and Texas Stream Team.

Assessment

Texas Integrated Report for CWA § 305(b) and §303(d)

The TCEQ evaluates the condition of the state's water bodies every two years as required by CWA §305(b). The results of this evaluation are contained within the

state's IR which is prepared by the TCEQ's SWQM team and submitted to the EPA for approval. The *Guidance for Assessing and Reporting Surface Water Quality in Texas* is based on a set of methods that apply the surface water quality standards and criteria. These methods are developed by the TCEQ with the advice of a diverse group of stakeholders, and are made available to partner organizations and stakeholders every two years, prior to the biennial assessment in which they will be used.

The IR describes the status of all surface water bodies of the state that were evaluated for the defined assessment period. The TCEQ uses data collected during the most recent five to ten year period in making its assessment. The data are gathered by many different organizations that operate according to approved quality control guidelines and sample collection procedures. The quality of waters described in the IR represents a snapshot of conditions during the defined time period.

One of five categories is assigned to each parameter and area of a water body, known as an assessment unit, to provide more information to the public, EPA, and agency staff about water quality status, management plans, and management activities. The categories indicate the status of the water body, and measures the state will employ to address identified water quality problems. Higher category numbers correspond to higher levels of effort required to manage water quality. For example, water bodies in Category 5 constitute the §303(d) List, and require remedial action by the state to restore water quality. For water bodies in Category 5a, the state must develop a scientific model called a TMDL and a plan to implement it. Water bodies in Category 1 are meeting all their uses, and require routine monitoring and preventive action.

When an assessment unit has multiple parameters identified in different categories, the highest category is assigned to the assessment unit. When a water body has multiple assessment units, an overall category is assigned to the entire water body. Further, these categories must be applied to each combination of designated use and the parameter (pollutant or condition of concern) that determines support of beneficial uses. The combination of the use with the parameter in a specific assessment unit is called an impairment. The concentration of dissolved oxygen is one of the criteria used to determine the support of the aquatic life use within each assessment unit and is one way water quality impairments are identified.

Table 4.2 summarizes the categorization of water bodies in Texas. Categories 4 and 5 represent the list of impaired water bodies as required by CWA §303(d). Since a water body has multiple uses, it may fall into different categories for different uses. In that case, the overall category for the water body is the one with the highest category number.

Table 4.2 Categories on the Texas IR

Category 1	Attaining the water quality standard and no use is threatened.
Category 2	Attaining some of the designated uses; no use is threatened; and insufficient or no data and information are available to determine if the remaining uses are attained or threatened.
Category 3	Insufficient or no data and information to determine if any designated use is attained.
Category 4	Standard is not supported or is threatened for one or more designated uses but does not require the development of a TMDL.
Category 4a	TMDL has been completed and approved by EPA.
Category 4b	Other pollution control requirements are reasonably expected to result in the attainment of the water quality standard in the near future.
Category 4c	Nonsupport of the water quality standard is not caused by a pollutant.
Category 5	Category 5 is the §303(d) list. The water body does not meet applicable water quality standards or is threatened for one or more designated uses by one or more pollutants.
Category 5a	A TMDL is underway, scheduled, or will be scheduled.
Category 5b	A review of the water quality standards will be conducted before a TMDL is scheduled.
Category 5c	Additional data and information will be collected before a TMDL or review of the water quality standard is scheduled.

For example, a hypothetical water body does not support the contact recreation use (Category 5c) or the aquatic life use (Category 5b). It supports the public water supply and general uses (Category 1), and the fish consumption use has not been assessed (Category 3). The designation for the entire water body is Category 5, since that is the highest category associated with any one of its uses.

§303(d) List

The §303(d) List (Category 5) is an important management tool produced as part of the assessment. It identifies waters which do not meet uses defined in the water quality standards. The §303(d) List is subject to review and approval by the EPA. A map of impaired stream segments based on the 2010 IR is illustrated in Figure 4.5.

When a water body is identified on the §303(d) list, certain new requirements may apply for facilities that discharge wastewater into the listed water body. Importantly, the TCEQ may not allow any new or expanded discharges of a listed pollutant into a Category 5 water body if it contributes to the impairment. Other possible effects on permits that may result from a restoration plan (e.g., TMDL) for the water body include:

- TCEQ may initiate amendments to impose new limits, or may impose them with routine renewals or amendments;
- permitted loading from existing facilities may be substantially reduced;
- new facilities may be required to meet more stringent effluent limits than expected;
- in some cases or areas, storm water permits may receive new or more

stringent limits;

- dischargers may no longer be eligible for general permits; and additional monitoring and reporting requirements may be added.

The §303(d) list also helps to determine how technical and financial assistance programs are implemented to address NPS pollution. These resources are used to help implement additional NPS management practices such as:

- management of runoff by such means as detention basins, filter strips, infiltration basins, porous pavement, retention ponds, and swales; and
- management of operations to decrease or eliminate pollutants in runoff, such as spill prevention and control, source controls, and education.

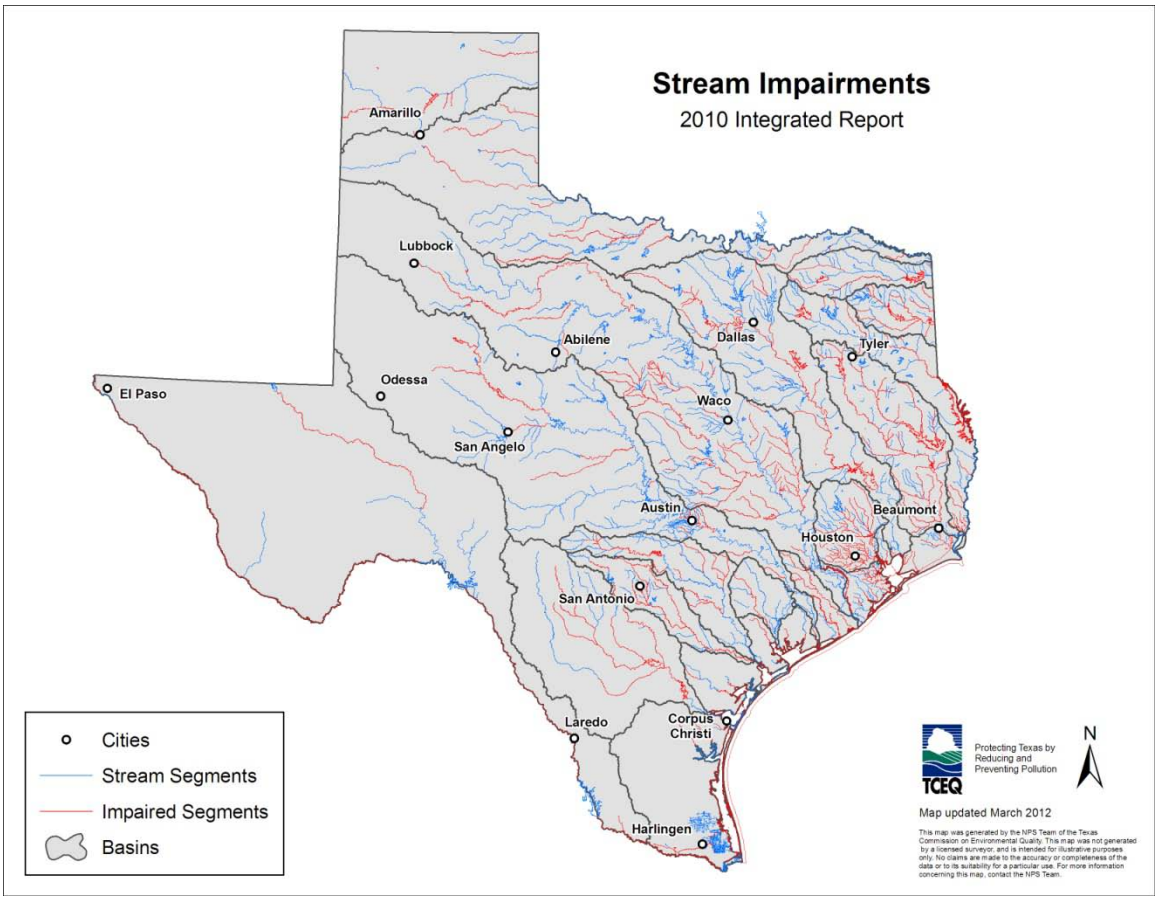

Figure 4.5 Impaired Stream Segments

Nonpoint Source Assessment

The CWA §319(a) assessment focuses only on those waters which have been identified as being degraded, at least in part, by NPS pollution. Texas' CWA §319(a) assessment of impaired waters is based on the Texas IR. In order to address the most current priorities for Texas and have a Management Program based on the most current information, the latest state approved Texas IR will

serve as the state's §319(a) assessment. NPS-degraded surface waters appearing in the report will be targeted by the state for additional NPS monitoring and restoration activities.

With regards to CWA §319(h) grant funding, priority for assessment dollars are given to those water bodies that fall within categories 5a, 5b, and 5c of the Texas IR. Assessment dollars may also be used to fund development of TMDLs, I-Plans and WPPs.

Groundwater Assessment

In 1996, the TGPC began the groundwater quality assessment process, through a partnership of the TCEQ and the TWDB, two of its member agencies. Assessment of all thirty aquifers is conducted as a part of the IR. Tables are included that show the parameters assessed against EPA drinking water standards, developed under the Safe Drinking Water Act, as well as, summaries of the sources and types of groundwater contamination at regulated facilities. Groundwater contamination case information in the IR is compiled from data contained in the *Joint Groundwater Monitoring and Contamination Report*.

For the state's IR, ambient groundwater quality data are drawn from the TWDB database. The number of wells reporting values for constituents of concern above the maximum contaminant level (MCL), or between the minimum detection level (MDL) and the MCL are determined, and these values are posted in a table for each aquifer, along with the total number of wells sampled in that aquifer.

The data are augmented by the data taken from the annual *Joint Groundwater Monitoring and Contamination Report* that lists groundwater contamination cases of the regulatory programs of the TCEQ, Railroad Commission of Texas (RRC) and GCDs. TCEQ reports data for groundwater contamination related to industrial and hazardous waste sites, municipal solid waste sites, leaking underground and above ground storage tanks, public drinking water supplies, wastewater disposal facilities, and other occurrences of contamination that may not be directly linked to a specific source or program. The RRC collects and reports data regarding groundwater contamination that may be related to oil and gas well drilling and production activities, transmission (pipeline) spills, and surface mining operations. GCDs typically monitor only those groundwater contamination cases that are of specific interest to the individual district, or those that do not fall under the regulatory umbrella of other agencies.

No water quality standards have been developed for groundwater under the federal CWA; however, the state's goal of non-degradation with respect to use is an acceptable definition as an assessment standard. For the purposes of the NPS assessment, any measurements of groundwater quality taken from the aquifers listed in the IR that exceed the MCLs for drinking water, are considered to be impaired with respect to existing or potential use. Constituents of concern that are above the MDL, but below the MCL, should be watched carefully over several

report cycles. An increase in the number of detections of a constituent can signal a growing problem, even though the MCL has not been exceeded. Groundwater that indicates degradation with respect to existing or potential use may be targeted by the state for additional NPS monitoring and restoration activities.

Nitrate is readily soluble and mobile in water, and is considered one of the major human health concerns in drinking water. Coincidentally, nitrate concentration may be an indicator of NPS pollution in groundwater because it can move readily through the soil, entering aquifers by means of percolation. Nitrate in surface water indicates the potential for groundwater contamination. Other groundwater quality constituents of concern may be naturally occurring, and not necessarily good indicators of NPS influence on the aquifers.

The rankings for priority aquifers that appear in Appendix D are averaged and do not reflect the intrinsic vulnerability of outcrop areas and/or known areas where recharge is occurring. For this reason, spatial examination of contaminant distribution is vital to any true assessment of aquifer quality or vulnerability prediction.

Upon further examination of the data from IR, it becomes readily apparent that constituent values exceeding the MCL occur predominantly in the "outcrop" portions of any aquifer with "outcrop" (unconfined) and "downdip" (confined) areas, or in completely unconfined aquifers like the Ogallala, Seymour, and Pecos Valley Alluvium. These "outcrop" areas of aquifers are more vulnerable to NPS impacts.

Analysis undertaken in a spatial context reveals that a disproportionate number of high nitrate values occur in the Rio Grande Valley area of the Gulf Coast aquifer. Therefore, this portion of the Gulf Coast aquifer must be labeled as impacted by NPS pollution. Sampling sites exceeding an MCL for a given constituent have also been targeted for more intensive study. These include the Lipan, Seymour, Marathon, Bone Spring-Victorio Peak, Edwards-Trinity (High Plains), Blaine, Ogallala, and Pecos Valley Alluvium aquifers.

Table D-2 in Appendix D ranks the vulnerability of major and minor aquifers. Highlights of this table are as follows.

- the Seymour and Edwards - Balcones Fault Zone in the San Antonio area, and the Edwards - Balcones Fault Zone in the Austin area, are major aquifers that have "high" vulnerability rankings;
- the northern extent of the Ogallala and the Pecos Valley Alluvium major aquifers received "low" or "medium" rankings, and the Hueco-Mesilla Bolson major aquifer ranked "low";
- the Brazos River Alluvium, Ellenburger-San Saba, and Marble Falls minor aquifers are listed as having a "high" vulnerability ranking; and
- the *Joint Groundwater Monitoring and Contamination Report* documents a number of significant impacts to the usable groundwater zone of the Hueco-Mesilla Bolson major aquifer, and related investigations

indicate a high potential for NPS impacts.

Strategy Development

The WAP process is used to develop strategies to address water quality issues. The strategies identified for addressing surface water quality issues in the WAP process are: monitoring, evaluation, WQS Review, TMDL/I-Plan, WPP, and other. A range of circumstances influence the decision regarding the strategy selected to address impaired water bodies on the §303(d) List. Strategies such as water quality standards review and watershed evaluation studies may result in delisting due to the increased understanding of water quality and circumstances in the watershed. WPPs are primarily developed to address issues caused by nonpoint sources. Federal regulations cite TMDLs as the basis for permitting decisions and may thus be more appropriate for issues caused by point sources.

Implementation

The implementation of pollution control measures for point and/or nonpoint sources of pollution may be required to address water quality impairments. These pollution control measures may employ both regulatory and non-regulatory mechanisms to limit pollution as needed to meet water quality standards. Regulatory mechanisms (such as wastewater and storm water discharge permits) establish legally enforceable pollution control requirements and consist of permitting, inspection, and compliance programs. Non-regulatory mechanisms are applicable to NPS. These measures encourage pollution control practices through educational, technical, and financial assistance provided by state and federal programs. Pollution control measures needed to achieve and maintain water quality standards are identified in plans developed by the WPP and TMDL processes. The development of these measures and some of the programs and strategies involved in their development are further described below.

Statewide Educational Program

The state's overall outreach and education programming is fundamental to the Management Program and the development of WPPs and TMDLs. The following are some examples of education outreach and training that help ensure watershed planning and implementation is a success.

Texas Watershed Planning Short Course

The Texas Watershed Planning Short Course provides the needed training and promotes sustainable proactive approaches to managing water quality throughout the state. This weeklong course provides participants with guidance on stakeholder coordination, education, and outreach; meeting the EPA's nine elements of a WPP; data collection and analysis; and the tools available for plan development. This information is presented through lectures and case studies. Proper training of watershed coordinators and water professionals is needed to

ensure that watershed protection efforts are adequately planned, coordinated, and implemented. To provide this training, the Texas Watershed Planning Short Course was developed through a coordinated effort led by the Texas Water Resources Institute (TWRI) and funded by the EPA through the TCEQ.

The TWRI partners with the Texas AgriLife Extension Service, Texas AgriLife Research, TSSWCB, TCEQ, EPA, Texas State University-River Systems Institute (RSI) and the Texas Institute for Applied Environmental Research (TIAER) to develop and conduct this short course. The Texas Watershed Planning Short Course has evolved into a fundamental tool used by the TCEQ and TSSWCB to achieve the goals and objectives of this Management Program.

Texas Watershed Steward Program

To support the need for stakeholder involvement, the Texas Watershed Steward Program (TWS) was initiated to provide science-based, watershed education to help citizens identify and take action to address local water quality impairments. Texas Watershed Stewards learn about the nature and function of watersheds, potential impairments, and strategies for watershed protection.

TWS is a one-day training program designed to increase citizen understanding of watershed processes and foster increased local participation in watershed management and WPP activities across the state. The program is tailored to and delivered in target watersheds undergoing TMDL or WPP development or implementation.

The program curriculum is comprised of five units including a program introduction, an overview of watershed systems, identification of watershed impairments, watershed management and regulation, and community-driven watershed protection strategies. The curriculum is compiled into a full-color handbook that also includes a comprehensive glossary of terms, and three appendices providing detailed information on federal, state, and local water quality agencies and organizations, important Web sites pertaining to water quality projects, management, and regulation, and a list of important activities for communities to engage in to help protect their local water resources. The program is delivered through interactive training events conducted by a team of professionals using high quality visual aids and hands-on teaching stations.

Online TWS training course materials are available on the program Web site (*http://tws.tamu.edu/*) and enable more flexible and widespread access to the training program.

Texas Watershed Coordinator Roundtable

The Texas Watershed Coordinator Roundtable is held bi-annually, to provide a forum for establishing and maintaining dialogue between watershed

coordinators, facilitate interactive solutions to common watershed issues faced throughout the state, and add to the fundamental knowledge conveyed at the Watershed Planning Short Course. The program has developed a listserv for watershed coordinators to receive information about the roundtables, training events and other useful information. Interested coordinators may contact TWRI at *twri@tamu.edu* for more information on how to subscribe to the listserv.

Texas Stream Team

Texas Stream Team is a statewide organization committed to improving water quality through citizen water quality data collection, stakeholder engagement, and watershed education. It is a network of trained volunteers and supportive partners working together to gather information about the natural resources of Texas and to ensure the information is available to all Texans.

Texas Stream Team was established in 1991. It is administered through a cooperative partnership between Texas State University, the TCEQ, and the EPA. Currently, over 250 Texas Stream Team volunteers collect water quality data on lakes, rivers, streams, wetlands, bays, bayous, and estuaries in Texas.

The Texas Stream Team citizen monitors sample streams, reservoirs, and tidal areas for *E. coli*, dissolved oxygen, specific conductivity, pH, Secchi depth, temperature, and various field observations including flow severity. Data are collected utilizing a QAPP and a four-phase training certification process. Intended data uses include problem identification, understanding background conditions, education, research, local decisions, and other uses deemed appropriate by the end user. Data summary reports and a data forum are available for viewing and download at the program Web site. There are over 43 data summary reports available for water resource managers, stakeholders, and others. The new data forum provides water quality data from the last ten years from every major river basin.

The watershed outreach program focuses on teaching participants about watershed functions and how NPS pollution impacts water quality. Watershed outreach services are delivered in myriad ways including curriculum distribution, NPS watershed model demonstrations, hands-on student scenario investigations, creek-side lessons, bacteria snapshots, water quality monitoring trainings, and hosting booths at special events. Texas Stream Team continues to provide outreach to hundreds of teachers and thousands of students each year. By providing customized watershed information and new ways to engage teachers and students, participants learn about local issues, factors influencing water quality, and ways to improve watershed health. Teacher workshops take place at universities, community education centers, partner offices, and at local creeks and reservoirs.

In addition to statewide programmatic activities, the Texas Stream Team also focuses efforts in targeted watersheds. A suite of watershed services such as NPS

pollution outreach, monitor trainings, outreach internships, community clean-up coordination assistance, data summary reports, and other initiatives are provided to assist in the development and implementation of watershed plans.

Urban BMP Initiative

The Urban BMP Initiative is an effort by the TCEQ NPS program to provide financial, technical, and educational assistance to municipalities in the state to support the implementation of urban BMPs including Low Impact Development (LID) storm water management practices. It is anticipated that this process of documenting the benefits of urban BMPs and communicating these benefits to municipal governments will lead to broader implementation of the urban BMPs.

Certain urban storm water management practices are required under Municipal Separate Storm Sewer System (MS4) permits and are therefore considered to be point source controls. These types of practices are not eligible for financial assistance from the TCEQ NPS program. However, those practices that are not required by permits, practices that have been determined to go "above and beyond" permit requirements may be eligible for assistance under the TCEQ NPS program. More information about the eligibility of TCEQ NPS program projects within MS4 jurisdictions is available at *http://www.tceq.texas.gov/waterquality/nonpoint-source/grants/grant-pgm.html#what-activities-are-eligible*. These determinations are made on a case-by-case basis with consultation with EPA.

New developments in urban BMPs include a rapid expansion in the development and use of LID storm water management practices and the integration of these practices into an overall green infrastructure strategy in municipal areas. EPA reports that municipalities around the country are going green as they strive to achieve healthier and more sustainable communities. EPA has signed a Letter of Intent to promote the use of green infrastructure in reducing storm water pollution and to encourage the use of green infrastructure by cities in municipal storm water programs. EPA literature cites the benefits of green infrastructure and LID practices to include reducing the volume of storm water runoff, reducing pollutant loadings, preserving areas that provide important water quality benefits, and reducing the costs of urban development. EPA states that LID practices can be used in both new development and re-development projects

The TCEQ NPS program is taking advantage of the interest and benefits of LID practices to help meet Management Program goals and objectives at the state level, in specific priority watersheds, and in the coastal zone. The TCEQ NPS program is implementing outreach efforts to priority municipalities (including coastal communities) to inform them of the technical and financial assistance resources available from the TCEQ to support the implementation of LID management practices. The goal of this initiative is to leverage limited state and federal resources to achieve broader and sustainable environmental benefits by helping communities incorporate LID practices into their local programs. The

initiative is based on the EPA publication *Incorporating Low Impact Development into Municipal Stormwater Programs* (EPA 901-F-09-005). This publication identifies several steps municipalities can take to institutionalize the use of LID practices in their community. TCEQ NPS seeks to assist these municipalities by providing financial assistance, supporting the implementation of demonstration projects, the development of technical guidance, educating developers and designers, and quantifying the costs and benefits of LID practices.

TCEQ NPS program provides financial assistance through the administration of the §319 and §604(b) federal grant programs. The TCEQ NPS program will continue to solicit and provide financial assistance for LID implementation projects in future years depending upon the quality of the projects and the availability of funding. Among other criteria, LID implementation projects will be evaluated based on the degree to which they: (1) reduce pollutant loads contributing to a water quality impairment, and (2) serve to institutionalize LID practices at the state, regional or community level.

Watershed Protection Plans

WPPs are locally-driven mechanisms for voluntarily addressing complex water quality problems that cross multiple jurisdictions. WPPs are coordinated frameworks for implementing prioritized and integrated water quality protection and restoration strategies driven by environmental objectives. Through the WPP process, TCEQ and TSSWCB encourage stakeholders to holistically address all of the sources and causes of impairments and threats to both surface and ground water resources within a watershed.

The TSSWCB and TCEQ apply the Watershed Approach to managing NPS pollution by supporting the development and implementation of WPPs. CWA §319(h) funds are utilized to develop and implement WPPs. In some cases third-party WPPs are funded and sponsored by entities and agencies other than the TCEQ or TSSWCB. WPPs are developed at the local level to address water quality issues and attainment of water quality standards. They are often based on special studies conducted to gather more data in certain areas where problems are known to exist but more intense monitoring is necessary to determine the source of the problem. WPPs across the state are illustrated in Figure 4.6.

WPPs are developed by river authorities, cities, or other local government entities to determine how to best solve the water quality problems of that area and to define the implementation activities needed to attain or maintain water quality standards. Priority for CWA §319(h) funding is provided to develop and implement these plans.

The Management Program encourages the use of available guidance in the development of WPPs. WPP development projects funded by CWA §319(h) federal grant funds in Texas are required to develop these plans in accordance with the *Nonpoint Source Program and Grants Guidelines for States and*

Territories promulgated by EPA (October 2003). EPA has also published the *Handbook for Developing Watershed Plans to Restore and Protect Our Waters* (March 2008) which provides in-depth guidance and technical tools for use in developing WPPs along with examples to illustrate how to apply these concepts to a specific watershed. EPA Region 6 has released a *Review Guide for Watershed-Based Plans* (January 2010) which helps the State and local watershed stakeholders better understand EPA expectations for satisfying the nine essential elements fundamental to a potentially successful WPP.

WPPs must be reviewed by the State (either TCEQ or TSSWCB) and then EPA to assess a plan's consistency with the nine essential elements and ensure a plan is eligible for CWA §319(h) implementation funding. The State and EPA utilize the EPA Region 6 *Review Guide* to conduct this consistency review. For WPPs developed utilizing CWA §319(h) grants from either TCEQ or TSSWCB, the funding agency will review the WPP and then seek EPA acceptance of the plan. Third-party WPPs must be submitted to the TCEQ or TSSWCB for nine element consistency review to ensure that the plan is integrated into the State's water quality management programs. Entities interested in developing third-party WPPs should consult with both agencies to determine how best to proceed.

The State of Texas believes that in some watersheds the development and implementation of a WPP may be a more viable approach to restoring water quality than through the establishment of a TMDL. Essentially, this perspective recognizes that certain alternative pollution control measures, such as a WPP, may obviate the need for a TMDL and that the most effective method for achieving water quality standards for some water bodies may be through management measures developed and implemented without TMDLs. EPA Region 6 has outlined a process by which the State may submit a WPP in lieu of a TMDL. The *EPA Region 6 Process for Review of Watershed-Based Plans in lieu of TMDLs* (May 2007) discusses the national guidance and regulatory mechanisms governing the process of utilizing WPPs in lieu of TMDLs, as well as, provides detail on how Integrated Report Category 4b relates to the nine essential elements of WPPs. As stated in Table 4.2, Category 4b is for impairments where "other pollution control requirements" will result in attainment of water quality standards. The significance and complexity of whether a WPP may serve in lieu of a TMDL necessitates close coordination between watershed stakeholders, the State and EPA. Entities interested in utilizing a WPP in lieu of a TMDL should consult with both TCEQ and TSSWCB to determine how best to proceed.

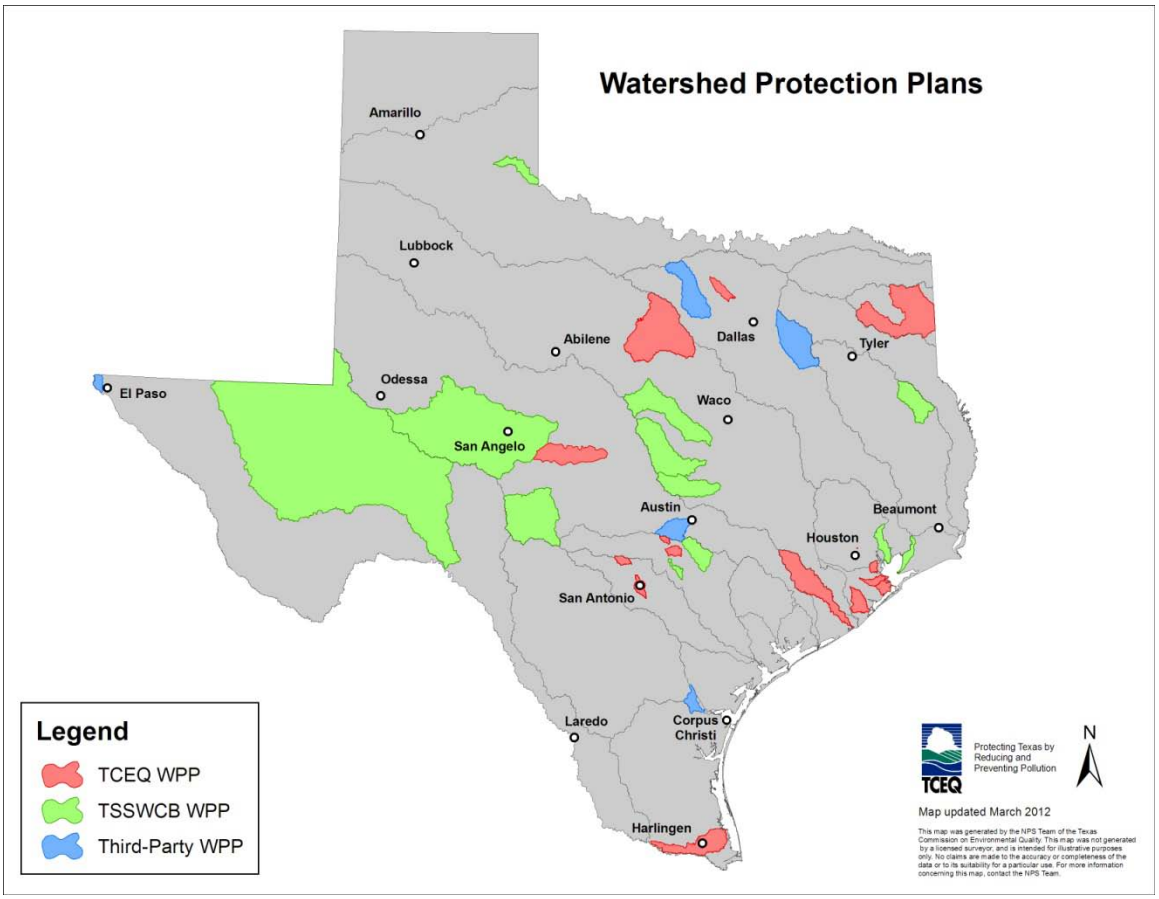

Figure 4.6 Texas Watershed Protection Plans

EPA's nine essential elements, listed below, will be addressed in plans developed and implemented through the CWA §319(h) Grant Program as required by EPA *Guidelines*.

a. An identification of the causes and sources or groups of similar sources that will need to be controlled to achieve the load reductions estimated.
b. An estimate of the load reductions expected for the management measures described in the plan.
c. A description of the management measures that will need to be implemented to achieve the load reductions estimated in the plan, and an identification of the critical areas in which those measures will be needed to implement the plan.
d. An estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon, to implement the plan.
e. An information/education component that will be used to enhance public understanding of the plan and encourage early and continued participation in selecting, designing, and implementing the management measures that will be implemented.
f. A schedule for implementing the management measures identified in the plan.

g. A description of interim, measurable milestones for determining whether management measures or other control actions are being implemented.
h. A set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made towards attaining water quality goals and, if not, the criteria for determining whether the plan needs to be revised.
i. A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria established in the plan.

The development of WPPs is supported by §319(h) funding to varying extents; however, a WPP that meets EPA's criteria is required to be completed in order to utilize §319(h) funding to implement portions of WPPs. The state's efforts to restore water quality are channeled through WPP development and implementation.

The state has identified five general areas of activity associated with WPPs which are implemented to meet the specific watershed-based goals of the program. These areas of activity are identified and generally described below.

Outreach and Partnership Development

The Watershed Approach is a coordinating framework that focuses public and private efforts to address water quality problems within a watershed. The diverse nature of NPS requires a varied response, including the establishment of a diverse partnership of stakeholders to plan, guide, and implement WPPs that are created for the particular conditions found within their watershed. Effective partnerships strengthen support for watershed-based environmental protection by increasing the quantity and improving the quality of available information. These partnerships foster local ownership of water quality, helping local stakeholders gain insight into the nature of water quality problems, which leads to voluntary actions toward the reduction of pollution.

To support this need for stakeholder involvement, the Management Program provides science-based, watershed education to help citizens identify and take action to address local water quality impairments. Citizens learn about the nature and function of watersheds, potential impairments, and strategies for watershed protection. Active public participation in local watershed management efforts is critical in addressing local water quality problems and concerns. The educational program is provided to all watershed residents including homeowners, business owners, agricultural producers, decision-makers, community leaders, and other citizens.

The Management Program coordinates the development and implementation of watershed management strategies with federal, state, and local stakeholders. Information derived from the state's water quality inventory identifies priority water quality issues in the state. These issues are discussed and evaluated annually with stakeholders at the watershed and state levels to identify

appropriate watershed management strategies and track their implementation. The outcomes of these discussions and evaluations are incorporated into the WAP process and serves as the basis for planning, budgeting, and implementing program activities.

Watershed Assessment

The Management Program supports watershed assessments needed to support watershed planning and implementation. Watershed assessments provide a basic understanding of the impairments of concern, the degree of difference between current and desired water quality and the likely sources contributing to the impairment. Characterizing the watershed and the water body segments for their associated impairments and causal sources provides necessary background information to support decisions regarding the approach used in managing water quality within the watershed. Source assessment results in an understanding of what major sources are contributing to impairment. The methods for completing a source assessment may vary but typically rely on information from state and national databases, literature reviews, and local knowledge from state, regional or local contacts.

An effective knowledge of the cause-and-effect relationship between pollutant sources and the water body response is necessary in order to guide the management of NPS pollution sources. Selecting the most appropriate approach to use for the analysis of cause-and-effect relationships requires a number of technical and practical factors. This analysis may be determined through either complex or simplified approaches using modeling and non-modeling methods.

Determining a pollutant load reduction that will allow a water body to support its designated uses involves applying anticipated load reductions from BMPs that will identify preferred strategies in meeting water quality standards. Factors affecting the selection of load reduction strategies include: the location and relative magnitude of sources, the pollutants of concern, the feasibility of load reduction strategies, the equitability among sources, ongoing control practices, and stakeholder priorities.

Watershed Planning

The primary mechanism for addressing NPS pollutant load reductions in Texas is through watershed planning. A WPP is a strategy and a work plan for achieving water quality goals. WPPs include information related to the watershed, watershed problems, water quality goals, solutions, partnerships, and measuring progress. The WPP is developed through a series of cooperative, iterative steps to characterize existing conditions, identify and prioritize problems, define management objectives, and develop and implement protection or remediation strategies as necessary. Effective watershed management processes require active participation from stakeholders as well as the analysis and quantification of the specific causes and sources of water quality problems. This, in turn, facilitates the identification of measurable water quality goals, and implementation of specific actions needed to solve those problems.

Reasonable efforts to obtain and analyze relevant data may result in only limited information at the planning stage. Preliminary information and estimates may need to be modified over time, accompanied by mid-course corrections in the watershed plan; and it often will require a number of years of effective implementation for a project to achieve its goals. The watershed planning process is dynamic and iterative.

Implementation

The Management Program supports the implementation of management measures needed to protect and restore water quality conditions. Financial assistance is provided through the CWA §319(h) grant program and other funding sources. Section 319(h) grants are made available on an annual basis to projects and programs set forth in the Management Program. Priorities for funding under the §319 grant program are given to projects which produce measurable reductions in pollutant loadings from NPS in accordance with goals established in accepted WPPs and for projects which leverage other funding sources. The TSSWCB provides financial incentives to agricultural producers through state and other federal financial assistance programs. Technical assistance is provided through the TSSWCB to assist agricultural producers in developing plans to limit water quality impacts from farming and ranching operations. Municipal planners in Texas receive technical assistance on urban runoff management measures through a series of technical workshops provided by the TCEQ. Educational opportunities for public officials, business owners, and the public are provided through the TCEQ.

Tracking, Evaluation, and Reporting

The state reports annually on its progress in meeting the schedule of milestones contained in the Management Program. Information on reductions in NPS pollutant loadings and improvements in water quality resulting from program implementation is also reported. The Annual Report provides a summary of progress in meeting approved milestones and the short- and long-term goals and objectives identified in the Management Program. The Annual Report includes information on program milestones associated with the applicable project or program, the scheduled project completion date, and the percent completed. The Annual Report summarizes available information on the extent of reductions in NPS loadings achieved, in addition to a summary of improvements in water quality as a result of Management Program implementation. Surrogate measures of environmental progress are used where appropriate.

Post-implementation monitoring is critical to determining the success of watershed implementation efforts. Pre- and post-implementation monitoring needs are included as a regular part of the state's monitoring strategy. By comparing monitoring results at key locations against specific metrics obtained with model results, stakeholders have a real measuring stick to guide them in assessing the success of their reduction efforts.

Total Maximum Daily Loads

CWA §303(d) and its implementing regulations (40 CFR §130.7) require states to identify waters that do not or will not meet applicable water quality standards after the application of technology-based or other required controls, and to establish TMDLs for pollutants that are causing non-attainment of water quality standards. For listed waters, States must develop TMDLs allowing for seasonal variations and an appropriate margin of safety. A TMDL is a quantitative assessment of water quality problems, contributing sources, and load reductions or control actions needed to restore and protect individual water bodies. Priority for CWA §319(h) funding is provided to develop and implement TMDLs. TMDL and I-Plan watersheds in Texas are illustrated in Figure 4.7.

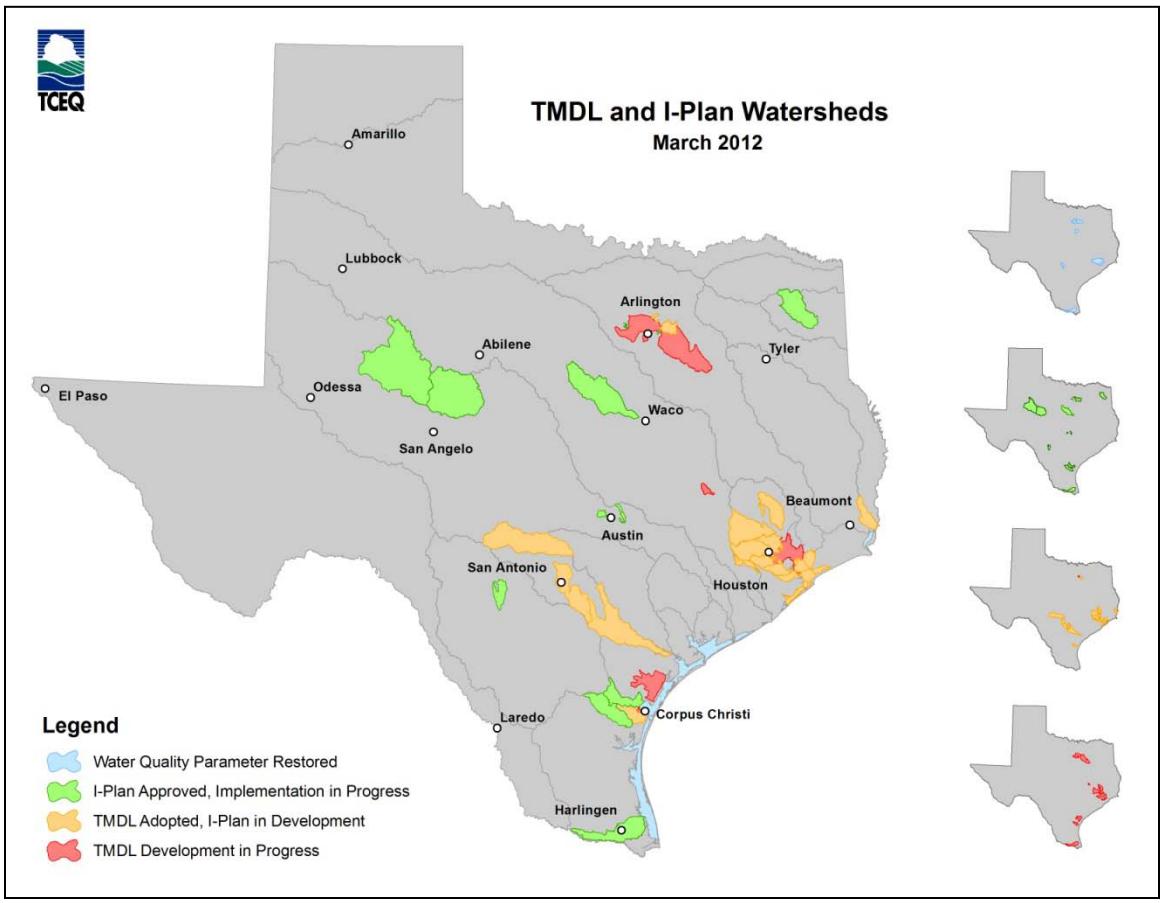

Figure 4.7 Texas TMDL and I-Plan Watersheds

A TMDL is a tool for achieving water quality standards that is based on the relationship between pollution sources and in-stream water quality conditions. TMDLs are developed to provide a basis for planning and implementing pollution controls, land management practices, and restoration projects needed to improve and protect water quality.

TMDLs address all significant stressors that cause use impairment, including: point sources such as sewage treatment plant discharges; nonpoint sources such

as runoff from fields, streets, construction sites, or forest land; and naturally occurring sources such as runoff from undisturbed lands. TMDLs may address individual pollutants or groups of pollutants, as long as they clearly identify the links between the use impairment, the causes of the impairment, and the load reductions needed to remedy the impairment.

At the most basic level, a TMDL is the sum of the individual wasteload allocations for point sources, load allocations for nonpoint and natural background sources, and an appropriate margin of safety. This equation expresses 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.

Public Participation

Public participation is an integral part of the TMDL process, and provides many opportunities for the public to participate. A few of the ways the public can participate in the TMDL process include:

- watershed committees established to provide local input on TMDL projects. The public is encouraged to work on these committees or attend their meetings;
- all meetings about TMDLs are open to the public, whether or not formal committees are established. Notices are provided for these meetings in local media outlets, through e-mail, and on the TCEQ's Web site. These meetings provide an opportunity for residents to make comments and get answers to their questions;
- the public is given the opportunity to review and provide comments on the development of the current CWA §303(d) list for the state; and,
- before the state adopts a TMDL, the TCEQ publishes the document publically and has a formal comment period. In addition, the TCEQ conducts a public comment hearing to listen to stakeholder concerns. Responses to all comments are published.

The TCEQ's TMDL Program uses four primary avenues for informing the public of its activities:

- its Web site, which includes program descriptions and the status of individual projects
- the pamphlet *Preserving and Improving Water Quality*
- an e-mail news list; and
- coordination with existing statewide and regional forums.

Statewide, the TMDL program coordinates with forums like the stakeholder work groups of the CRP and the NPS Management Program. Regionally, the program coordinates its projects with the CRP Basin Steering Committees, and SWCDs if agricultural or silvicultural operations may be affected by the TMDL. For some TMDL projects, the existing CRP forum serves as the advisory group for the project; for other projects, a separate advisory group may be formed.

Alternatively, the state may conduct public meetings within the watershed at key points in the project development.

The amount of time it takes to address a listed segment varies greatly. In some cases, a segment may be addressed within one to three years of its listing; in other cases, several years may be needed. Several factors influence the scheduling of management activities for all three categories (5a, 5b, and 5c) of the list, such as the number of successive years a segment has been on the list, scheduled permit renewals, or administrative demands. Available funding ultimately determines how many new restoration or management projects will be initiated annually.

The TCEQ is committed to beginning development of TMDLs for all segments in Category 5a within 13 years of their initial listing in accordance with EPA guidance. In compliance with the federal regulations, the TCEQ prepares a schedule after each IR is completed that identifies the TMDLs that will be initiated within the next two years. Numerous factors are considered in determining the schedule including: whether the impairment affects human health, local and regional support for TMDL development, data availability for immediate TMDL development, proximity of one impaired segment to others that have similar or related pollutants, similarity of the strategies and actions needed to address impairments, and the availability of funding. The TMDL schedule is submitted to the EPA in April of even-numbered years along with the §303(d) List. A list of current, completed, and pending TMDL projects can be found at *http://www.tceq.texas.gov/waterquality/tmdl/nav/allprojects*.

Key Components of a TMDL

The development of TMDLs begins with the review of existing data and/or the collection of additional data related to water quality, point source discharge, precipitation, stream flow, soils, geology, topography, and land use (construction, agriculture, mining, etc.). Next, analytical methods are used to calculate pollutant loads and the response of the receiving water. The appropriate method is selected based on the pollutants of concern, the amount of data available, the type of water body, and watershed conditions. If a computer model is selected, data from the watershed may be used to calibrate the model and verify that the computed values match known conditions. The model can then be used to develop alternate scenarios, by first determining the amount of specific pollutants each source contributes, then calculating the amount each pollutant needs to be reduced, and finally specifying how the reduced pollutant load would be allocated among the different sources. In some cases, TMDLs can be based on readily available information and studies using simple analytical efforts. In other cases, more complex, data intensive computer simulations are required.

Upon completion of data collection and analyses, a TMDL report is developed, and adopted by the state after a thorough public review and comment period. The state-adopted TMDL is submitted to EPA for review and approval. The TMDL report consists of nine component parts:

- Problem Statement;
- Endpoint Identification;
- Source Analysis;
- Linkage Between Pollutant Sources and Water Quality in the Receiving Water;
- Margin of Safety;
- Load Allocations;
- Account for Seasonal Variation;
- Ensure Public Participation; and
- Provide Reasonable Assurances of Implementation.

TMDL I-Plan

The TMDL I-Plan document provides an overview of the programs and strategies that will be used to implement the TMDL. It is used as a basis for the implementation planning process. Management activities may be non-regulatory, regulatory, or incentive-based. The plan should demonstrate that implementation of the required pollution reduction measures is both likely and within the legal authority of the implementing organizations (reasonably assured).

For example, the plan may show that point source dischargers will be required to reduce discharges of the pollutant of concern through enhanced treatment technology, and that such enhancements are reasonable and achievable. If new or amended rules are necessary to implement the TMDL, the plan may cite the laws and regulations that give it the authority to enact such rules. The plan may also identify funding sources available for implementing the TMDL, and indicate that the selected implementation activities are eligible for funding under the identified state, federal, or private grants or incentives.

Compliance with load allocations may also be assured by setting numeric targets for pollutant concentrations at individual sampling sites and regularly monitoring conditions at those sites. A commitment to periodic and repeated evaluations of the effectiveness of the chosen implementation methods is another way of providing reasonable assurance. Continuing evaluation allows for the adaptation of implementation activities based on the environmental progress observed, giving further assurance that compliance with water quality standards is attained.

Monitoring for Results

In addition to WPPs and TMDLs, there are many other programs in place throughout the state that are responsible for conducting implementation activities. Upon implementing a BMP or other implementation activity it is necessary to determine the effectiveness of the activity. Data collected after implementation must be compared to data collected prior to implementation to determine effectiveness. These data may be historical, like that collected for a

special study, or collected as part of the project tasks prior to implementation. In some cases, routine monitoring can be used to evaluate effectiveness. In other cases, it will be necessary to collect data in a specific project area to evaluate the effectiveness of the implementation activities. Certain types of BMPs or implementation activities will not show immediate results. Effectiveness and water quality improvements will be determined over time, and not immediately upon implementation.

Groundwater Strategy

The TGPC serves as the main mechanism for coordinating the protection of groundwater quality in the state. The TGPC strives to improve or identify areas where new or existing programs could be enhanced to provide additional protection for groundwater resources. The committee actively seeks to improve existing groundwater programs and promotes coordination among agencies and GCDs.

Though the membership of the TGPC is limited by statute, the primary work of the TGPC is carried out through subcommittees and task forces, which are comprised of staff from member agencies, as well as any interested party. The subcommittees include the Agricultural Chemicals Subcommittee, the Data Management Subcommittee, the Public Outreach and Education Subcommittee, the Groundwater Research Subcommittee, and the NPS Task Force.

While all of the subcommittees are involved to a greater or lesser extent with NPS issues, the NPS Task Force is specifically tasked to address groundwater NPS issues. The Task Force is co-chaired by the TSSWCB and the TCEQ.

Groundwater Protection Strategy

There are no programs that focus solely on examining the quality of water in privately owned wells used for domestic drinking purposes, the segment of Texas' population most likely to be impacted by NPS pollution of groundwater; however, there are programs that include testing of domestic well water. Up to 20% of the wells from which the TWDB has collected groundwater samples are domestic. The TWDB analyzes samples for naturally occurring inorganic constituents, nutrients, trace metals, and radionuclides; however, TWDB does not test for organics that might be present due to NPS pollution.

Studies conducted by various agencies have indicated that both man-made and naturally occurring contaminants (e.g., fecal coliform, nitrate, radionuclides, pesticides and pesticide degradation byproducts, arsenic, and other heavy metals) have been found in some domestic wells at levels that exceed health-based MCLs (based upon a lifetime exposure to the constituent).

The TGPC is responsible for developing and updating the *Texas Groundwater Protection Strategy* that details actions to be taken to remedy impacts to sources

of drinking water (for both private and public wells) and address other aspects of NPS pollution.

The state's groundwater protection efforts are implemented through three types of groundwater program activities: groundwater protection, groundwater remediation, and groundwater conservation.

Additional strategies for addressing NPS pollution in groundwater are provided in Chapter 3 in the Groundwater Constituents of Concern Report section and Appendix D.

Joint Groundwater Monitoring and Contamination Report

The *Joint Groundwater Monitoring and Contamination Report* is a compilation of all known groundwater contamination cases in the state that are under the jurisdiction of state regulatory agencies and GCDs, and the enforcement status of those cases. In general, once groundwater contamination has been confirmed through regulatory compliance monitoring or investigation, the case will follow a generic sequence of actions until the regulatory authority concludes no further action is necessary. The sequence of actions to verify pollutant sources and develop plans based on this report generally consists of confirmation of the contamination; an investigation to study the extent, composition, and circumstances of the contamination; and the planning of corrective action measures based on the investigation. This report focuses on contamination from point sources; however, information from the report is used in NPS assessments to ascertain the potential of contaminants from nonpoint sources to impact an aquifer.

Chapter 5 Agency Program Descriptions Supporting NPS Management

The Management Program utilizes a partnership among many organizations, to protect and restore water quality. With the extent and variety of water quality issues across Texas, the need for cooperation at all levels is essential. Surface water bodies and aquifers are not limited by political boundaries and therefore environmental solutions often cross federal, state, and local levels of responsibility. By establishing a coordinated framework to share information and resources, while minimizing unnecessary duplication, the state can more effectively focus its water quality protection efforts. This chapter provides a description of the agencies and their respective programs that are used to address NPS in Texas.

Interagency Agreements

Maximizing the utilization of local, state, and federal resources is essential if limited resources are to be effective. Texas has implemented a variety of mechanisms to ensure and improve coordination among and between federal, state, and local officials for addressing water quality. A list of some of the agreements and strategic partnerships is provided below in Table 5.1.

Table 5.1 Federal, State, and Local Agreements

Cooperative Entities	Type of Agreement	Purpose of Agreement
TCEQ and TSSWCB	MOU	Facilitate cooperation between the two primary Texas NPS control agencies in achieving program goals.
TCEQ and TSSWCB	MOA	Sets forth the cooperating responsibility and authority regarding development of TMDLs and WPPs.
TSSWCB and The Texas A&M University System	MOU	Establishes commitments to work together to accomplish statewide NPS pollution reduction goals with the state's agricultural and silvicultural producers. AgriLife Extension will conduct soil and water conservation and NPS management demonstrations and related educational activities, and AgriLife Extension will cooperate with TSSWCB and SWCDs to identify research needs relative to soil and water conservation and NPS management.

Cooperative Entities	Type of Agreement	Purpose of Agreement
TCEQ and RRC	MOU	Clarifies the division of jurisdiction between TCEQ and RRC with regards to wastes generated in connection with oil and gas exploration, development, and production activities.
USDA-NRCS with local SWCDs	MOA	Sets forth the cooperation for SWCDs to furnish technical assistance to farmers and ranchers in the preparation of soil and water conservation plans.
TCEQ and TWDB	MOA	Sets forth the cooperation, responsibility and authority regarding the development of TMDLs.
TCEQ and TDA	MOA	Sets forth the cooperation, responsibility and authority regarding the development of TMDLs.
TCEQ and Texas Agricultural Experiment Station, Texas Cooperative Extension and TFS	MOA	Sets forth the cooperation, responsibility and authority regarding the development of TMDLs.
TSSWCB and USDA-Forest Service	MOU	Sets forth the responsibilities and activities to be performed by each agency in carrying out the Management Program as related to activities on National Forest System Lands.
TPWD and TxDOT	MOU	Provides a formal mechanism by which the TPWD may review TxDOT transportation projects, including those that have the potential to affect natural resources and to promote the mutually beneficial sharing of information which will assist TxDOT in making environmentally sound decisions.
TCEQ and U.S. Coast Guard	MOA	Outlines the responsibilities for the recovery of abandoned sealed containers on Texas beaches for pollution prevention and response.
GLO and U.S. Coast Guard	MOA	Provides for agreement to cooperate and to coordinate efforts in implementing and exercising their respective statutory and regulatory duties related to pollution prevention and response.

State Agencies

The following sections describe the various state agencies and the programs they administer which contribute to managing NPS pollution in Texas.

Texas State Soil and Water Conservation Board

The TSSWCB, established in 1939, works in partnership with the state's 216 local SWCDs to encourage the wise and productive use of the state's natural resources in a manner that promotes a clean, healthy environment and strong economic growth. The TSSWCB is the lead agency in Texas responsible for:

- coordinating the programs and activities of the state's 216 local SWCDs;
- planning, implementing and managing programs and practices for preventing and abating agricultural and silvicultural NPS water pollution;
- administering a Water Supply Enhancement Program to increase available surface and ground water through the targeted control of noxious brush species that are detrimental to water conservation; and
- facilitating the Texas Invasive Species Coordinating Committee,

The TSSWCB is governed by a seven-member State Board composed of two Governor-appointed Members and five Members elected from across Texas by the Directors of the state's 216 SWCDs. All Members of the State Board must be landowners actively engaged in farming or ranching. Specific agency programs, functions, and initiatives which are implemented to fulfill statutory responsibilities and that collectively represent the agency's efforts in supporting the goals and objectives of this Management Program are described below. More information about the TSSWCB is available at *http://www.tsswcb.texas.gov/*.

Water Quality Management Plan Program

With the passage of Senate Bill 503 in 1993, the 73rd Texas Legislature directed the TSSWCB to establish a WQMP Program to abate agricultural NPS water pollution. The WQMP Program is administered by the TSSWCB through local SWCDs and provides a voluntary, incentive-based, natural resource conservation planning mechanism to agricultural producers and other rural landowners who choose to implement BMPs that prevent and abate NPS pollution. The WQMP Program includes technical assistance to participants for the development of WQMPs, as well as financial incentives to participants to assist with the installation of specific BMPs prescribed in WQMPs. The WQMP Program is the state's primary BMP implementation program for agricultural and silvicultural lands as specified in this Management Program.

Through the WQMP Program, agricultural and silvicultural producers develop and implement site-specific WQMPs in cooperation with local SWCDs. WQMPs include appropriate and essential land treatment practices, production practices, management measures, or technologies applicable to each planned land use (e.g., cropland, rangeland, pastureland). Specific BMPs included in WQMPs are based on the best available management and technology as described in the USDA-NRCS Field Office Technical Guide. Local SWCDs provide technical assistance to program participants to develop WQMPs through agreements with USDA-NRCS and the TSSWCB. After being approved by the local SWCD, the developed WQMP requires TSSWCB certification. Certified WQMPs ensure farming or ranching operations are carried out in a manner consistent with state water quality standards. While participation in the WQMP Program by agricultural producers is generally voluntary, the 77th Texas Legislature, in 2001, amended the TWC to require all persons who own or operate a poultry facility to implement and maintain a WQMP certified by the TSSWCB.

The Texas Legislature provides funding (state general revenue) through the TSSWCB for the implementation of WQMPs. In accordance with statute, the TSSWCB identifies priority areas across the state where water quality is being impacted, or has the potential to be impacted, by agricultural and silvicultural NPS water pollution. The TSSWCB then allocates state funding to specific SWCDs in those priority areas to serve as financial incentives for implementing WQMPs. In establishing and periodically changing these priority areas, the TSSWCB considers water bodies identified as impaired on the *Texas §303(d) List*, threatened areas in which action is necessary to prevent NPS pollution and other concerns such as impacts to groundwater. In addition to state funds directed to these priority areas, the TSSWCB utilizes CWA §319(h) grant funds to assist landowners and SWCDs in developing and implementing WQMPs in watersheds with WPPs or TMDLs.

Nonpoint Source Grant Program

The NPS Grant Program is administered by the TSSWCB for the purpose of providing funding as grants to cooperating entities for activities that address the goals and objectives in this Management Program. The Texas Legislature and the U.S. Congress (through the EPA) provide funding to the TSSWCB to implement the agricultural and silvicultural components of this Management Program through the TSSWCB NPS Grant Program.

Agricultural and silvicultural NPS pollution prevention and abatement activities that can be funded through the NPS Grant Program include: implementation of WPPs and the NPS portion of TMDL I-Plans, SWQM, demonstration of innovative BMPs, technical assistance and financial incentives for the development and implementation of TSSWCB-certified WQMPs, public outreach and education, development of WPPs, and monitoring activities to determine the effectiveness of specific pollution prevention methods.

Since 1990, Congress has annually appropriated grant funds to states through the EPA under §319(h) for the implementation of each state's NPS Management Program. The §319(h) funding allocated to the State of Texas is split evenly between the TSSWCB and the TCEQ. TSSWCB directs its share of §319(h) funds through the agency's NPS Grant Program. Additional detail on §319(h) funding is provided in Chapter 2.

The 80th Texas Legislature appropriated state general revenue funds to the TSSWCB for the purpose of planning, implementing, and managing programs and practices for preventing and abating agricultural and silvicultural NPS water pollution in impaired watersheds; subsequent Legislatures have continued this appropriation. On September 17, 2009, the TSSWCB approved a revised *TSSWCB Policy on TMDLs and Watershed Planning, Assessment, and Implementation Activities* which provides guidance on directing these state appropriations through the agency's NPS Grant Program. This *Policy* is available

at *http://www.tsswcb.texas.gov/managementprogram#StateGR*. The *Policy* directs the use of these state funds to activities consistent with the goals and objectives of this Management Program, including, but not limited to, watershed planning and assessment, BMP implementation, and research on the efficacy of BMPs.

Flood Control Program

Nearly 2,000 floodwater retarding structures, or dams, have been built over the last 60 years within Texas. The primary purpose of the structures is to protect lives and property by reducing the velocity of floodwaters, and thereby releasing flows at a safer rate. These are earthen dams that exist on private property, were designed and constructed by USDA-NRCS, and have local governmental sponsors responsible for their operation and maintenance. SWCDs are one of the local governmental sponsors on all of the flood control dams across the state; other local sponsors include counties, cities, and water control and improvement districts. In order for these aging dams to continue to serve as critical protection for lives, private property, and the state's infrastructure, the Texas Legislature has appropriated state funds to the TSSWCB for grants to SWCDs and other local sponsors for operation and maintenance and structural repair and rehabilitation of these dams.

A secondary benefit of properly maintained and functioning flood control dams is the reduction of NPS pollutants (e.g., sediment) in floodwater downstream, helping to accomplish the state's CWA goals. By trapping sediment and other pollutants, these dams contribute to the protection of water quality in downstream water bodies, such as major water supply reservoirs. Studies have examined the rate at which sediment is trapped by these dams and the various pollutants (e.g., nutrients, heavy metals, pesticides) buried in sediment cores from the impoundments behind these dams (Dunbar 2009). While TSSWCB flood control grant funds are targeted to dams based on priorities associated with protecting lives and property, this agency program supports the state's water quality goals and contributes to achieving the goals and objectives of this Management Program.

Water Supply Enhancement Program

In 1985, the 69th Texas Legislature created the Texas Brush Control Program and designated the TSSWCB as the agency responsible for administering the Program. The 82nd Texas Legislature made major revisions to the Program including redefining the goals and purpose and changing the name to the Water Supply Enhancement Program. The goal of the Program is to increase the availability of surface and ground water supplies through the targeted control of water-depleting brush species (e.g., mesquite, juniper, saltcedar). The Texas Legislature appropriates state funds to the TSSWCB to implement this Program through financial incentives to landowners. These funds are directed to brush

control projects in selected, priority watersheds throughout the state.

The relationship between water quality and the hydrologic nature of flow is readily apparent in water bodies in the arid regions of Texas. The loss of discharge directly results in the concentration of pollutant loadings and the loss of critical aquatic habitat, affecting the state's ability to accomplish CWA goals. Historical hydrologic data has demonstrated a relationship between loss of perennial stream flows and the encroachment of woody brush. Studies have indicated that brush control can enhance surface water flows, recharge of groundwater in aquifers, especially alluvial aquifers, and spring discharge (Saleh et al. 2009). Brush control and other water supply enhancement projects can restore aquatic habitat, improve water quality, and help achieve other beneficial uses of water bodies and CWA goals. While TSSWCB Water Supply Enhancement Program funds are targeted to watersheds based on priorities associated with water conservation needs and projected water yields, this agency program supports the state's water quality goals and contributes to achieving the goals and objectives of this Management Program.

Outreach and Education

The TSSWCB implements a robust outreach and education program targeted to the general public, youth, and agricultural producers. The TSSWCB prepares and disseminates public information relative to the agency and SWCD functions, programs, events, and accomplishments. TSSWCB staff annually participates in a variety of seminars, conferences, workshops, and agricultural trade shows. TSSWCB staff provides guidance to SWCDs on their individual education programs. The TSSWCB conducts training for newly elected SWCD directors on SWCD operations and programs to help them better serve landowners and agricultural producers. TSSWCB collaborates with the Texas Future Farmers of America organization and others to sponsor the Wildlife Alliance for Youth which affords youth the opportunity to experience soil, water, and related resource conservation management techniques in the outdoors. In collaboration with the Association of Texas SWCDs, TSSWCB has a Conservation Video Library giving teachers access to over 200 conservation-related videos with no rental fees. TSSWCB staff utilizes physical watershed models in classrooms to help students understand how water supplies can be impacted by NPS pollution. In partnership with SWCDs, TSSWCB carries out an annual Texas Conservation Awards Program which includes a soil and water stewardship public speaking contest and a poster and essay contest for students. TSSWCB regularly disseminates Conservation News, a compilation of readily available current news and information regarding natural resource issues, and agency press releases to an email subscriber list. As required by statute, the TSSWCB hosts the Annual Meeting of Texas SWCD Directors, bringing SWCDs from across the state together to discuss common challenges and solutions to natural resource conservation issues. The TSSWCB's comprehensive outreach and education program supports the state's water quality goals and contributes to achieving the goals and objectives of this Management Program.

Texas Commission on Environmental Quality

The TCEQ strives to protect the state's human and natural resources consistent with sustainable economic development. The TCEQ implements many sections of the TWC, federal CWA, and Safe Drinking Water Act. The TCEQ develops water quality requirements designed to protect attainable uses and to maintain the quality of waters in the state. The TCEQ has a number of programs that address various aspects of NPS pollution management through planning, the setting of standards, data collection, assessment, targeting and prioritization, and implementation.

TCEQ Nonpoint Source Program

The goal of the NPS program is to protect and restore water quality from NPS pollution. This goal is achieved through assessment, implementation, and educational activities. The strategy utilized by the NPS program is to work with stakeholders to develop and implement programs and practices which minimize NPS pollution at the source, manage unavoidable NPS pollution, and which complement other state water resource goals. The objectives of the NPS program are to establish public/private partnerships, develop watershed plans, assess water quality and watershed conditions, implement cost effective management measures, and evaluate and report progress. Success of the NPS program is measured through water quality improvements, NPS pollutant load reductions, and the implementation of NPS controls and educational programs. Agency activities for addressing NPS pollution are described below.

NPS Assessment Report

The NPS Program coordinates with state water quality monitoring and assessment programs to produce the NPS Assessment Report as required by federal CWA §319(a). The report identifies the waters within the state that are impaired by NPS pollution.

NPS Management Program

The NPS program coordinates with partners in the state to produce the NPS Management Program as required under federal CWA §319(b). The Program outlines the comprehensive and integrated strategy used in Texas to restore waters impacted by NPS pollution. The Program indentifies the practices and programs that will be undertaken to reduce loadings of NPS pollution and contains a schedule of annual milestones for the use of these programs and practices.

CWA §319 Grant

The NPS Program administers the provisions of federal CWA, §319 to control urban and non-agricultural NPS pollution. Section 319 authorizes grant funding for states to develop projects and implement NPS management strategies. The

TCEQ NPS staff manages the NPS categorical grants to implement the goals identified in the Texas NPS Management Program. The program annually applies for funding from the EPA. Annual federal funding is about 6.5 million dollars. The §319 grant provides 60% federal funds and requires a 40% non-federal match. TCEQ solicits applications through a Request for Grant Applications (RFGA) to develop projects that make up a Work Plan (20-25 applications are received annually). After applications are received, projects are reviewed, and ranked. The number of projects funded depends on the amount of each contract. Therefore this number fluctuates from year to year. Over 50% of the money awarded from the federal government must be used to fund WPPs and TMDL I-Plans.

NPS Annual Report

The program prepares the NPS Annual Report which identifies the progress in meeting the schedule of milestones contained in the NPS Management Program.

Watershed Protection Plans

CWA §319 funds are utilized to develop and implement watershed-based plans. WPPs are developed at the local level to address water quality issues. WPPs are often based on special studies conducted to gather more data in certain areas where problems are known to exist but more intense monitoring is necessary to determine the source of the problem.

CWA §604(b) Grants

The NPS Program also administers the provisions of federal CWA §604(b). These funds are derived from state revolving fund appropriations under Title VI of the CWA, using a legislatively mandated formula. Money is passed through to Council of Governments for "planning" purposes.

TCEQ Water Quality Standards Program

The TCEQ is the lead agency in the state responsible for establishing and revising standards to protect surface water quality in accordance with the federal CWA, §303(c). TWC, §26.023 provides that the commission is the sole and exclusive authority to make rules setting water quality standards for all waters in the state. The TWC stipulates that the state may amend the standards from time to time.

The TCEQ Water Quality Standards Group is responsible for establishing and revising standards to protect surface water quality. The TSWQS recognize the regional and geologic diversity of the state. Appropriate uses are established in the TSWQS for surface waters in the state and the associated numerical and narrative criteria provide a basis for permitting, assessing water quality, and restoration targets for managing point and nonpoint source loadings in Texas surface waters.

TCEQ Surface Water Quality Monitoring Program

The TCEQ's SWQM Program is coordinated by the SWQM staff in the TCEQ's central office and 16 regional offices. Routine monitoring and special studies are conducted by SWQM personnel.

Texas routinely monitors and assesses water quality under programs administered by the TCEQ. These data are collected by federal, state, regional, and local agencies and are compiled into the Texas IR for CWA § §305(b) and §303(d). The IR categorizes water bodies impaired by NPS pollution and provides information on the nature and extent of the water quality problem. CWA §303(d)-listed water bodies are further categorized to determine the priorities for conducting water quality assessments or implementing restoration activities.

TCEQ Clean Rivers Program

The TCEQ administers the Texas CRP. The CRP is a collaboration of 15 regional water agencies with the TCEQ. It is a unique, water quality monitoring, assessment, and public outreach program that is funded by state fees assessed on the number and size of wastewater treatment plants and surface water right permittees that reside within each river basin. The CRP provides the opportunity to approach water quality issues at the local level through coordinated efforts among diverse agencies, various programs, and the public.

TCEQ Data Management & Analysis Program

Water quality assessments, including assessments for NPS pollution, depend upon having accurate and available water quality data. The TCEQ Monitoring and Assessment Section Data Management and Analysis Team (DM&A) provides assurances of the quality and availability of water quality data in the state. It is responsible for management of surface water quality data and metadata in cooperation with other TCEQ water programs and the Information Resources Division (IRD). This responsibility includes documentation and maintenance of records relating to the processes described in Data Management Reference Guide. Relationships between DM&A and other water program areas are documented in project-specific QAPPs. Data not meeting quality requirements set forth in these QAPPs may be stored in the Surface Water Quality Monitoring Information System (SWQMIS) with appropriate qualifiers.

The purpose of the Data Management Reference Guide is to assist TCEQ CRP Partner Agencies, TMDL Program contractors, SWQM Program staff, Standards Group staff and contractors, NPS Program contractors, and any other TCEQ programs or external entities submitting data to the TCEQ SWQMIS database. The guide outlines the processes for requesting parameter codes, station ID numbers, submitting and collecting entity codes, tag prefixes, corrections to data in SWQMIS, and data reports. It also explains data review and data reporting (including data reporting formats) and contains reference maps, tables, and

descriptions for use when submitting data to the TCEQ. Guidance is also provided for using SWQMIS tools to extract and interact with data in the database. Links are provided to internet resources that are dynamic in nature and change too frequently for TCEQ to publish in this document.

The original SWQM Program was established in 1967 with the purpose of collecting and analyzing the data necessary to describe the water quality of Texas streams, reservoirs, and estuaries. Today, SWQMIS contains more than 42 years of physicochemical and biological data from up to 8,500 monitoring stations throughout Texas. This data is collected by the TCEQ, contributing river authorities, cities, and other local, state, and federal agencies.

The SWQMIS is maintained by the TCEQ. This database serves as a repository for TCEQ surface water quality data. SWQMIS also provides validation and reporting tools, a mapping interface, and modules for tracking information about analytical laboratories, quality assurance documents, and monitoring equipment.

The statewide water quality database has received data since 1967, allowing for the assessment of short and long-term trends. This data may be used by TCEQ to characterize existing conditions, evaluate spatial and temporal trends, develop water quality standards, determine water quality standards compliance, identify emerging problems, and evaluate the effectiveness of water quality control programs.

TCEQ Total Maximum Daily Load Program

The TCEQ TMDL program is responsible for developing TMDLs in accordance with CWA §303(d) and its implementing regulations (40 CFR §130.7). These regulations require states to identify waters that do not or will not meet applicable water quality standards after the application of technology-based or other required controls, and to establish TMDLs for pollutants that are causing non-attainment of water quality standards. For listed waters, states must develop TMDLs allowing for seasonal variations and an appropriate margin of safety. A TMDL is a quantitative assessment of water quality problems and contributing sources that need to be addressed to restore and protect individual water bodies.

TCEQ Estuary Programs

The National Estuary Program (NEP) was established under CWA §320 to "identify nationally significant estuaries which are threatened by pollution, development, or overuse; promote comprehensive planning for, and conservation and management plans for estuaries of national significance; and enhance the coordination of estuarine research." There are two active estuary programs in Texas. The first was established for the Galveston Bay system and the second was established for the bays and estuaries along the Coastal Bend of South Texas. The Galveston Bay Estuary Program (GBEP) is a program of the TCEQ and the

Coastal Bend Bays and Estuaries Program (CBBEP) is a non-profit organization. Each of these estuary programs developed a Comprehensive Conservation and Management Plan (CCMP) which recommends priority actions and implementation schedules to address impacts observed in the estuary. The CCMP development is a consensus-based process involving a partnership across federal, state, and local levels. With the completion of the CCMPs, each NEP formed a nonprofit, nonregulatory management structure to implement its plan.

Galveston Bay Estuary Program

GBEP is a continuation of the NEP established for Galveston Bay in 1989. The GBEP is a partnership of bay stakeholders currently working to implement the Galveston Bay Plan. The plan contains action plans addressing habitat and species protection, freshwater inflows, spills and dumping, exotic species, point sources of pollution, and nonpoint sources of pollution to protect and restore the health of the estuary, while supporting economic and recreational activities. Eighty-two initiatives are outlined under these nine action plans. The GBEP takes a leading role in facilitating and coordinating the implementation of these initiatives.

NPS pollution is the number one identified water quality problem in Galveston Bay. Implementation of the Galveston Bay Plan includes the following actions to address this problem: developing and implementing a Galveston Bay public education program with the goal of reducing pollution from residential areas; compiling a Galveston Bay BMP Performance Document to inventory NPS control techniques which have been evaluated; identifying and correcting priority watershed pollutant problems by maintaining and publishing an inventory of NPS concerns in the bay watershed; adopting regional construction standards for NPS reduction and implementing toxics and nutrient control practices; encouraging sewage pump-out, storage, and provisions for treatment; and implementing storm water programs for local municipalities.

To date, the GBEP has addressed NPS pollution by convening a forum for information sharing among Galveston Bay stakeholders involved in NPS pollution prevention/control activities, providing technical assistance to local and county governments, and educating and reaching out to children and adults. The GBEP partners with the Houston-Galveston Area Council, the Galveston County Health District, the Galveston Bay Foundation, and the Texas A&M Sea Grant Program to provide technical assistance on storm water management to local governments; provide technical assistance to small businesses on implementation of waste minimization strategies and general BMPs; develop, maintain, and publish an inventory of NPS concerns in the bay watershed; implement a bay wide public education program aimed at reduction of pollution from residential areas through illustration, presentations, and workshops; and to conduct voluntary inspections and provide information assistance to reduce bacterial pollution caused by malfunctioning septic systems.

Coastal Bend Bays and Estuaries Program

The TCEQ and EPA helped establish the CBBEP to develop and implement a plan to protect and restore the bays and estuaries of the Texas Coastal Bend. The CBBEP has developed a CCMP to deal with a wide array of problems ranging from public health and education, freshwater flow, and loss of natural habitats. Through implementation of the plan, the CBBEP has completed the following actions that serve to protect bays and estuaries from NPS pollution:

- created a handbook of urban NPS pollution BMPs for voluntary use by local communities and provided assistance training of appropriate BMP use to the community leadership;
- provided compliance assistance to small business and industries in the region which are subject to storm water National Pollutant Discharge Elimination System (NPDES) permit program or have NPS controls needs;
- provided assistance to local governments to implement OSSF programs;
- provided upgrades and/or replacement of failing OSSFs in targeted colonias; and
- coordinated and facilitated the development of agricultural water quality management programs necessary to meet water quality standards.

TCEQ Wastewater Permitting Program

A fundamental consideration for achieving CWA goals is the ability to control sources of pollutants that may be impairing or threatening the quality of navigable waters. In many jurisdictions, the discharge of pollutants from point sources is a significant factor to address when managing the condition of water bodies. Point source permitting programs are integral to the state's NPS program because in many cases the goals of the NPS program cannot be fully realized without consideration of impacts from permitted sources.

Pollutant discharges from point sources are controlled through the TPDES permit program administered by the TCEQ. Through the TPDES program, Texas prohibits the discharge of pollutants from a point source into a "water of the state" unless the operation has been granted authorization through a permit by rule or a TPDES individual or general permit that explicitly allows discharges by establishing:

- what and how much of a pollutant can be discharged into a receiving water;
- what monitoring and reporting on discharges are required; and
- other conditions necessary to carry out the intent of the CWA.

The state of Texas assumed the authority to administer the NPDES program in Texas on September 14, 1998. NPDES is a federal regulatory program to control discharges of pollutants to surface waters of the United States. The TCEQ's TPDES program has federal regulatory authority over discharges of pollutants to Texas surface water, with the exception of discharges associated with oil, gas, and

geothermal exploration and development activities, which are regulated by the RRC.

A TPDES permit may be written to address discharges either from an individual point source or from a number of similar dischargers.

TPDES Individual Permit

The TCEQ may issue an individual permit to a point source that includes site-specific conditions such as effluent limitations, management practices, and monitoring and reporting requirements. The more complex the point source discharge, the more likely an individual permit is required.

TPDES General Permit

The TCEQ may issue a general permit to authorize the discharge of waste into or adjacent to water in the state by category if the permitting authority finds the discharges in the category are storm water or the dischargers in the category:

- engage in the same or substantially similar types of operations;
- discharge the same types of waste;
- are subject to the same requirements regarding effluent limitations or operating conditions;
- are subject to the same or similar monitoring requirements; and
- are more appropriately regulated under a general permit than under individual permits.

The TCEQ may also issue a general permit to authorize the discharge of waste by categories of dischargers within the entire state or within a discrete geographical area identified by an appropriate division or combination of geographic or political boundaries. A facility that does not or cannot meet the requirements of the general permit must obtain authorization under an individual permit. The general permit also includes limitations for coverage for certain facilities. After a general permit is issued, dischargers that meet the eligibility criteria in the permit can request coverage under the permit by submitting a Notice of Intent (if required by the permit) to the permitting authority.

Classification of Wastewater Permits

TPDES permits are grouped into two categories based broadly on the type of wastewater they treat. They are further classified based on ownership and the volume of flow permitted.

Wastewater that results from daily living activities is called domestic wastewater. Facilities that treat wastewater that has the characteristics of domestic wastewater are classified as municipal wastewater treatment facilities. Domestic sewage may contain wastewater from industrial processes but does not lose its classification as domestic sewage unless the characteristics of the sewage changes.

Facilities that treat wastewater from primarily industrial sources are classified as

industrial wastewater treatment facilities. Industrial wastewater sources include manufacturing, food processing, chemical production, oil refining, CAFOs, and many varied commercial and industrial processes. Industrial wastewater may also contain some domestic wastewater.

Wastewater treatment facilities that are owned by a state, tribe, or municipality are classified as publically-owned treatment works (POTWs). All privately owned wastewater treatment facilities are non-POTWs. Both POTWs and non-POTWs may treat municipal wastewater, industrial wastewater, or a combination of the two.

TCEQ divides these categories further between major and minor facilities. A major discharger is one with a permitted flow equal to or greater than one million gallons per day (gpd) or one that has been determined to be a major facility by the EPA based on certain high priority discharges. A minor discharge is all other facilities.

TCEQ establishes the "effluent limits" of a TPDES permit based on two separate and unique approaches established in the CWA. The limits based on these approaches are described in the next section.

Technology-based effluent limits

Technology-based effluent limits are required as the "minimum level of control that must be imposed" in an NPDES permit. EPA establishes national technology-based standards for municipal dischargers and for various categories of industrial facilities. The standards and guidelines are based on the performance of actual treatment systems or other pollutant control technologies, such as process controls and material substitution. By not being site specific, the standards and guidance put all facilities within an identified category on an equal footing.

Water quality-based effluent limit

Further limits on discharges of pollutants may be necessary if the limits achievable using the available technology are not sufficient to prevent impacts from discharges into the receiving waters in regard to compliance with the state's water quality standards. EPA has identified the following steps to assess the need for water quality-based effluent limits (WQBELs). TCEQ must then establish the limits as necessary based on the assessment.

Step 1. Identify applicable water quality standards.
Step 2. Characterize the effluent and receiving water.
Step 3. Determine the need for parameter-specific WQBELs.
Step 4. Calculate parameter-specific WQBELs.

Following these steps enable TCEQ to implement water quality standards in TPDES permits based on:

- knowing the current water quality standards, including any changes;
- being familiar with water quality standards implementation policies; and

- using procedures adopted by the commission to establish limits that are as stringent as necessary to attain the state's water quality standards.

No-Discharge Permits

Texas Land Application Permits (TLAPs) are no discharge permits that authorize individual facilities to dispose of wastewater without discharging into or adjacent to water in the state. TLAPs may authorize septic systems over 5,000 gpd or may authorize the storage of wastewater in ponds, which is then evaporated or land applied via a surface or a subsurface irrigation system. Discharges from the storage ponds are prohibited except under certain conditions, such as catastrophic rainfall conditions that exceed the design criteria of the ponds. Land application rates are limited to the agronomic needs of the cover crop and the soil infiltration rates. The permittee must monitor soils in the land application areas for nutrients, metals, and salts to determine and monitor the appropriate application rates. The permittee is prohibited from land applying effluent in sensitive areas that may result in contamination of surface or groundwater.

Storm Water Management

TPDES permits regulate storm water discharges from industrial activities, construction activities, and MS4s to Texas surface waters. The TCEQ issues and manages TPDES permits for storm water discharges from these activities and systems.

The urban storm water program administered through the TPDES program addresses medium and large municipalities under the federal Phase I storm water rule, and addresses small municipalities under the Phase II rules. Growing urban fringe areas and other urban development are regulated under the Phase II rules if they are located within an Urbanized Area or if they are designated by TCEQ as needing coverage. If an urban area falls within the scope of the storm water program, a TPDES permit is required in which a management plan for the reduction of the runoff impacts must be implemented locally, permit compliance must be evaluated, and maintenance or improvement of surface water quality must occur, consistent with the water quality standards. Factors that EPA require states to consider in designating MS4s for permit coverage that are outside of Census-defined urbanized areas include discharges to sensitive waters, high growth areas or growth potential, contiguity to an existing regulated MS4, significant contribution of pollutants to surface water, and ineffective protection of water quality by other state programs.

The Beneficial Use Sludge Permitting Program

Sewage sludge, also known as biosolids, must be properly processed, transported, and used or disposed of in order to prevent adverse environmental and public health impacts. Sewage sludge is a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage, scum, or solids removed in primary, secondary, or advanced wastewater treatment processes; and material derived from sewage sludge.

Sewage sludge can also be combined with water treatment sludge, which is the material generated during the treatment of either surface water or groundwater for potable use. Water treatment sludge is not considered an industrial waste.

Because of the nutrient and soil-conditioning characteristics of most biosolids, local governments are encouraged to consider beneficial land application or composting of sludge. Land application of certain biosolids for a beneficial use must be authorized by the TCEQ. Land application of compost for beneficial use does not require authorization by TCEQ. However, the TCEQ does require authorization to process and to market and distribute compost. Beneficial use is defined as the land application of treated municipal sludge at or below the agronomic needs of a cover crop or the use of water treatment sludge as a soil amendment.

Because some municipal wastewater treatment facilities also receive industrial wastewater, sewage sludge may contain pesticides and chemicals along with human waste. A permit is required for most activities that involve the processing, transportation, beneficial use, or disposal of sewage sludge. If sludge is not of domestic origin, it is regulated as either a municipal solid waste or an industrial solid waste.

Agricultural Permits

Animal Feeding Operations (AFOs), such as feedlots, dairies, and poultry operations, can be a source of pollutant discharges following rainfall events. An AFO is required to apply for a wastewater permit if it confines more than a given number of animals. These CAFOs are prohibited from directly discharging into surface water except under chronic or catastrophic rainfall events or catastrophic conditions.

AFOs that are not classified as CAFO's and dry litter poultry facilities do not require written authorization. These facilities are regulated by rule. AFOs and dry litter poultry CAFOs may choose to obtain a WQMP from the TSSWCB. The WQMP must meet the same technical requirements as the rule. All dry litter poultry operations must obtain a TSSWCB-certified WQMP. AFOs and CAFOs may receive technical assistance from the TSSWCB and the USDA-NRCS.

The TCEQ CAFO permitting program reviews technical designs of CAFOs for new facilities, facilities being modified or enlarged, and for facilities renewing their authorization. The designs are reviewed to ensure that the retention lagoons are appropriately sized and that sufficient land is available to apply wastewater at agronomic rates. Applications are also reviewed to ensure that BMPs will be implemented to control air emissions and odor in a manner to conform to industry standards. Waste and wastewater application rates are reviewed to ensure that land application does not exceed agronomic rates.

A Pollution Prevention Plan (PPP) must be prepared for every permitted CAFO

facility in the state. The PPP must be prepared in accordance with good engineering practices and include measures necessary to limit the discharge of pollutants to waters in the state. The PPP must include:

- practices to ensure compliance with the CAFO rules;
- a site plan indicating all animal confinement areas, waste treatment and retention facilities, and waste and wastewater application areas;
- application rate calculations;
- design calculations for retention facilities;
- identification of potential pollutant sources used, stored, or disposed of at the facility;
- BMPs used to control potential pollutant sources;
- identification of recharge features with BMPs used to protect them; and
- required monitoring and inspection records, including procedures for monitoring discharges and sampling of land application areas.

The Dairy Outreach Program

Some areas of the state have been identified as having a higher potential for water quality problems and concerns from AFOs. The areas involved in TCEQ's Dairy Outreach Program Area (DOPA) include Erath, Bosque, Hamilton, Comanche, Johnson, Hopkins, Wood, and Raines counties. The number of animals requiring written authorization is lower for AFOs located in the DOPA. For example, the threshold for dairies is reduced from 700 to 200 head.

Owners and operators of dairy CAFOs located in the DOPA must complete an initial eight-hour course of continuing education in animal waste management and a subsequent eight hours every two years. Similarly, owners and operators of a CAFO are required to train all employees responsible for work activities relating to compliance regarding the proper operation and maintenance of the facility. Employees at all levels of responsibility must be informed of the general components and goals of the PPP. Training topics include land application of waste, proper operation and maintenance, good housekeeping and material management practices, recordkeeping requirements, and spill response and cleanup.

Water Quality Assessment, Standards Implementation Team

The Standards Implementation Team of the Water Quality Division is responsible for the implementation of the Texas Surface Water Quality Standards, 30 TAC Chapter 307 through wastewater permits. Team functions include:

- evaluation of TPDES permit applications for determination of statewide and site-specific designated uses and criteria for the protection of human health and aquatic life in the receiving streams;
- conduct receiving water assessments;
- administer the whole effluent toxicity (WET) program to ensure protection of surface water from in-stream toxicity due to wastewater discharges;
- 401 State Water Quality Certifications of Federal 404 Dredge and Fill permits and other federally permitted or licensed projects; and

- perform site reviews and criteria development for the following agency programs: Leaking Petroleum Storage Tanks, Voluntary Cleanup Program, and Superfund.

Water Quality Assessment Team

The Water Quality Assessment Team addresses technical issues related to surface water discharges through the TPDES permitting process and is responsible for reviewing geology and soil issues relative to TLAP Permits.

This team also provides support for the development of scientifically-based wastewater discharge permit limits for dissolved oxygen demanding constituents in order to protect human health and aquatic life consistent with the 30 TAC Chapter 307. The group conducts analyses and provides specific technical information and recommendations to the wastewater permitting program to use in developing wastewater permits for facilities discharging into waters in the state. The team also coordinates quarterly updates to the state's WQMP, which contains updates of permitted effluent information for amended and new permits. The state's WQMP provides an avenue for updates of approved TMDLs. The group assists the wastewater permitting section by coordinating with the TMDL Team.

Groundwater Protection (Water Quality Division)

The primary function of the Water Quality Division's Water Quality Assessment Team (WQAT) is to conduct groundwater impact evaluations of TLAP individual and CAFO general permits to ensure that the permitted operations are protective of groundwater quality and comply with applicable rules. Groundwater protection staff provide technical support for all permit-related activities for soil science, soil chemistry, agronomy, groundwater quality, groundwater recharge potential, vadose zone geology, and groundwater migration to the wastewater permitting section for permit reviews, rule writing, bill analysis, and inquiries from the public, other government agencies, the regulated community, and internal customers. Additionally, the WQAT reviews permit-required data to assess effectiveness of site management. If groundwater problems are detected, staff may modify permits with corrective action measures and coordinate with the Enforcement or Remediation Division staff to mitigate the release. The WQAT also reviews nutrient management plans (NMPs) and nutrient utilization plans (NUPs) required by 30 TAC Chapter 321, Subchapter B and 30 TAC Chapter 312. The WQAT also assists the regulated CAFO community and the Field Operations Division in resolving issues related to misidentified, abandoned, or damaged wells in order to ensure an updated recharge feature certification and permit file. Additionally, the WQAT provides a public service by reporting groundwater contamination issues to the TGPC via the annual *Joint Groundwater Monitoring and Contamination Report* and the Impact Evaluation Team.

TCEQ Water Supply/Water Rights Permitting Program

Protecting Stream Flows

Water availability is an issue in Texas due to the increasing difficulty of meeting the needs of people, industry, and the environment. Across the state, naturally occurring periods of low rainfall are exacerbated by increases in human population and in activities that require water. According to the State Water Plan published by the TWDB, the total demand for water is expected to increase 27% from 2000 to 2060. The availability of water in rivers and streams is an issue of quality as well as quantity. Insufficient water flows in streams can affect the quality of the aquatic environment, rendering them more susceptible to temperature and dissolved oxygen fluctuations as well as inputs from point and nonpoint sources. It can also limit the flows of fresh water into downstream estuaries, which are dependent on fresh water for their ecological health and fisheries uses.

The TCEQ is involved on several fronts with the protection of state stream flows as authorized by TCEQ rules and the Texas Legislature. Under Senate Bill 2 (2001), the TCEQ cooperates with the TPWD and the TWDB in the Texas Instream Flow Program to conduct studies for determining flow conditions in the state's rivers and streams necessary to support a sound ecological environment. In a complementary fashion, Senate Bill 3 (2007) directs the TCEQ to facilitate a stakeholder driven process to derive environmental flow recommendations for major rivers and bays and estuaries for incorporation into TCEQ rules. By rule the TCEQ also conducts environmental reviews of water right applications to assess the possible impacts of granting of a water right on fish and wildlife habitat, water quality and the in-stream uses associated with the affected body of water. Possible impacts to bays and estuaries are also addressed for those permits within 200 miles of the Gulf of Mexico.

Water Rights Permit Review

Water flowing in Texas' creeks, rivers, and bays is public property; however, the state of Texas confers on individuals and organizations the right to pump water from a stream, creek, pond, or lake or to impound water in a lake or pond, under the authority of TWC, Chapter 11. With a few exceptions, surface waters may be used only with explicit permission of the state, granted in the form of water rights. Water rights projects have the potential to cause, amplify, or exacerbate NPS problems through flow modification, dam construction, sediment load alteration, loss of wetlands, and removal of riparian vegetation. Each application for a water right permit is reviewed for administrative and technical requirements by the TCEQ to evaluate its impact on other water rights, bays and estuaries, conservation, water availability, public welfare, etc. TCEQ assesses the effects that issuance of a water rights permit will have on existing in-stream uses including, water quality, fish and wildlife habitat, recreation, and freshwater inflows to bays and estuaries. Factors that the TCEQ evaluates when performing an assessment of a water right permit include the flow characteristics of the stream, aquatic life use, and biological integrity of the stream, water quality

issues, presence of species of concern, and recreational uses. In addition to setting streamflow restrictions, mitigation may be recommended for altered, inundated, or destroyed terrestrial or riparian wetland habitats. The results of these assessments are incorporated into limitations and/or special conditions attached to water right permits in order to protect the environmental integrity of the impacted water body.

Public Drinking Water

Many Texans get their drinking water from large scale municipal water systems that rely on surface water resources, such as rivers, lakes, and reservoirs. Others depend on private sources, such as wells and aquifers. Contamination can occur in surface or groundwater supplies from wastewater discharges, urban and agricultural runoff, leaking underground storage tanks, improperly maintained OSSFs, waste sites, abandoned wells, and deposition of airborne pollutants. The State of Texas pays special attention to protecting surface and ground water supplies that serve as a source of drinking water. Protecting drinking water at the source makes good public health, economic, and environmental sense. The aquifers, lakes, and rivers that are designated by law for use as sources of drinking water are called source waters. The TCEQ protects source waters by:

- assessing their susceptibility to pollution; and
- assisting local communities to develop source water protection programs.

The following is a discussion of the state programs that focus on the protection of drinking water sources.

The Source Water Assessment and Protection Program

The TCEQ Source Water Assessment and Protection (SWAP) program was created in 1996 by the Safe Drinking Water Act. SWAP combines source water assessment (SWA) and source water protection (SWP).

Source Water Assessments

The SWA assesses a Public Water Supply system's susceptibility to 227 potential drinking water contaminants. Specific elements scrutinized include location, intrinsic characteristics, contaminant occurrence, point and nonpoint source pollution, and construction. These elements are compared with several hundred thousand database records to produce a technically defensible assessment product. The goal of the SWA component leads to local Source Water Protection. A SWA report has been provided to each of 6,000 public water systems (PWS) and is intended to lead to the implementation of source water protection projects and BMP implementation. The SWA reports are used by the TCEQ SWAP program to drive the activities, and the recommended BMPs aimed at minimizing or eliminating the affects of NPS contaminants.

Under the SWAP program all surface and ground waters that contribute to public drinking water supplies are investigated for potential contamination. Investigations proceed in the following stages:

- identification of areas that supply public drinking water;

- delineation of the boundaries of the assessment areas needed to protect the water supplies;
- inventorying of potential sources of contamination within the assessment areas;
- informing the public of the results; and
- implementation of a source water protection program.

A report assessing the vulnerability of each source water is provided to the operators of systems that supply public drinking water. The assessments consider the location of pollutant sources, intrinsic characteristics, contaminant occurrence, well construction, geology, known point sources, and land uses that occur within the capture zone of groundwater wells and within the watersheds of surface water intakes.

The assessments provide the scientific basis for the implementation of source water protection projects. Water systems are encouraged to take an active role in verifying the completeness and accuracy of the data used in the assessment report. Source water protection is a program to prevent contamination of groundwater or surface water that is used as a source of public drinking water. Water suppliers implement source water protection programs by working cooperatively with community members and by educating people about issues that affect their drinking water. All public water supply systems may receive assistance through TCEQ technical assistance services in developing plans and implementation measures free of charge. Priorities for state assistance with plan development are set according to the results of the susceptibility assessments. The protection and assessment of source waters is required and authorized under the federal Safe Drinking Water Act, §1453.

Source Water Protection

Source Water Protection is a voluntary, pollution prevention program implemented at the local level. All public water supply systems are eligible to participate in the program. The TCEQ provides technical assistance and guidance to local Public Water Supply systems that implement recommended BMPs. The TCEQ coordinates BMP recommendations or implementation with other agencies/organizations with expertise and/or jurisdiction. These BMPs include signs to increase public awareness, educational programs, site-specific protection plans, and local ordinances. The TCEQ recommends communities participating in the program voluntarily implement BMPs based on results of potential contaminant source inventories. Most SWP participants have implemented programs by working cooperatively with community members and through public education programs. Costs associated with implementing a SWP program are much lower than cleaning up a contaminated water source. Implementation costs are eligible for funding through the TWDB's Drinking Water State Revolving Fund loan program.

For over fifteen years, TCEQ has used funds from the NPS Program to fund source water protection activities. Additionally, information developed for the

NPS Program serves as valuable information and data about land-based contamination sources which provide valuable input into the SWA process. For example, BMPs funded with §319 grants for the protection of water quality in the Edwards Aquifer may also have applicability in source water protection areas.

The hallmark of Source Water Protection is to identify a PWS's water source, sensitive contributing areas, possible sources of contamination (PSOCs), and recommend BMPs to eliminate or minimize the threat of contamination. These recommendations often advocate the involvement of other agencies/organizations having relevant expertise and/or jurisdiction to provide increased public awareness, educational programs, site-specific protection plans (i.e. TMDLs, I-Plans, WPPs), and local ordinances. Most SWP participants have implemented their programs by working cooperatively with community members and providing public education. The costs for implementing a SWP program are minimal and dramatically less than remediating contaminated drinking water.

Finished drinking water data is collected by the TCEQ's Drinking Water Quality Program. Additional supporting information is provided by the SWAP Program.

Groundwater Planning and Assessment

Groundwater Planning and Assessment is responsible for implementing the Texas Groundwater Protection Strategy, administering the interagency TGPC, and developing and implementing the state's Generic State Pesticide Management Plan and Pesticide-Specific Management Plans.

Activities of the TGPC that are supported include arrangement of meetings, compilation and maintenance of meeting records, leadership on subcommittees, compilation and preparation of data for the *Joint Groundwater Monitoring and Contamination Report* and the groundwater portion of the IR.

Groundwater Planning and Assessment administers the state's Priority Groundwater Management Area Program, provides limited oversight of groundwater conservation districts relating to the adoption and implementation of management plans, processes and reviews landowner petitions for groundwater conservation district creation and provides reports and legislative support for groundwater management and groundwater conservation district activities.

Groundwater Planning and Assessment also provides leadership and support to the TGPC's Agricultural Chemicals Subcommittee, a key player in pesticide management plan development. The program initially focused on NPS contamination of agricultural pesticides in groundwater, but has since branched out into all pesticides.

Additionally, Groundwater Planning and Assessment provides technical support for all TCEQ groundwater related programs, as well as oversight and technical support for a variety of special initiatives and studies, including investigations of

nitrate and arsenic occurrence in groundwater, and a recent study of the Carrizo-Wilcox Aquifer.

Groundwater Planning and Assessment compiles and maintains the Interagency Pesticide Database, which is part of an interagency effort of the TGPC to assess groundwater impacts from the label-specified use of agricultural chemicals. The database contains the results of groundwater monitoring for pesticides collected by various agencies and other entities that sample groundwater.

Pesticide Management

The TCEQ is the state lead regulatory agency for pesticide contaminated water regulations. The legislature and federal government have granted the TCEQ:

- the responsibility for the development of management plans for the prevention of water pollution by pesticides. TCEQ is to solicit advice from the TGPC in developing such plans;
- the authority to regulate chemical wastes discharged to the waters in the state (including groundwater) from tailwater or runoff from agricultural lands; and
- the authority to issue an NPDES permit.

Groundwater Planning and Assessment has been responsible for groundwater protection activities related to pesticides since 1989, including conducting the agricultural chemical monitoring programs as outlined in the *Texas State Management Plan for Prevention of Pesticide Contamination of Groundwater*. The monitoring represents ambient screening for atrazine and other constituents depending on location, funding, and specific immediate concerns.

Additional pesticide related activities include:

- delineating areas vulnerable to pesticide contamination;
- conducting cooperative ambient monitoring in vulnerable areas;
- investigating detects to determine source and extent;
- ongoing monitoring of known high detects for long-term trend analysis and BMP effectiveness; and
- assessing pesticides of interest or concern in the online Pesticides of Interest Tracking System (POINTS).

TCEQ Small Business and Environmental Assistance Program

Pollution Prevention

The key to controlling NPS pollution is often prevention. Preventing contaminants from reaching water in the first place mitigates environmental risks from pollution and eliminates the need for expensive clean-up programs. Community, business, and citizen involvement are integral to successful pollution prevention. There are simple day-to-day activities Texans can do to prevent

pollution. Educating individuals about those activities and implementing prevention programs can be accomplished on a larger scale by federal, state, or local government programs. The following sections describe several programs that work with citizens, businesses, and industries to encourage voluntary use of pollution prevention activities.

The Site Visit Program

The TCEQ offers free, confidential site visits to identify compliance issues to small businesses and local governments, which includes independently owned and operated businesses with 100 or fewer employees and independent school districts. After a site visit from the TCEQ's contractor, the facility receives a report detailing recommended actions the facility can take to resolve environmental compliance deficiencies. After making necessary corrections, the facility may be eligible for a Compliance Commitment (C2) certificate. Possessing a C2 certificate will exempt the facility from TCEQ-scheduled inspections and other participating partner inspections for one full year. Facilities may renew C2 certificates after following program guidelines. For information on eligibility requirements and participating partners, visit *www.tceq.texas.gov/assistance/c2/site.html* or call (800) 447-2827 to ask about participating in the program.

Household Hazardous Waste Program

The TCEQ's Household Hazardous Waste (HHW) Management program offers assistance to municipalities and individuals who are interested in the proper collection and disposal of HHW. Resources include educational and regulatory information; technical assistance in setting up a collection program; contact information for existing programs; and general information on relevant issues.

Take Care of Texas Program

Take Care of Texas is a statewide campaign designed to improve water quality and prevent NPS pollution. The Take Care of Texas campaign includes initiatives identified below.

> Resources for Students and Teachers - The Take Care of Texas Web site offers an expanded kids' page with educational information for students including six interactive games that teach environmental themes. The Web site also offers teaching resources to help educators promote awareness of environmental sciences.
>
> Publications - The TCEQ has many publications available to provide assistance and educational information. The Take Care of Texas program offers free materials to help citizens and communities learn how all Texans can improve the environment, including publications on how to practice environmentally responsible lawn care to improve water quality and reduce water use.

The TCEQ also offers subscribers a free, online newsletter called Take Care of

Texas News You Can Use. This monthly newsletter offers current information to educate customers, suppliers, employees, or students about why and how they can improve the environment. More information on the Take Care of Texas campaign can be found at *www.takecareoftexas.org*.

TCEQ On-Site Sewage Facilities Program

Texas Guidelines for Management of On-site Sewage Facilities
In Texas, an OSSF is defined as a wastewater system with a daily flow of less than 5,000 gallons where the wastewater is treated and disposed on the property where it is generated. In 1989, the Texas legislature passed legislation to regulate OSSF systems statewide. The law required the state to establish a minimum construction code for all newly installed OSSFs. The law also encouraged the state to delegate its regulatory power to local governments who may adopt more stringent regulations than the state minimum. Texas presently has 4-5 million residents relying upon OSSFs for wastewater disposal and with 35,000 permits issued on average per year. Approximately 98% of the permits issued in the state are issued by local governments.

In order to properly manage OSSFs to protect public health and the environment, Texas employs the following guidelines:

Permits required for lots less than 10 acres
In order to construct or operate a new OSSF, a property owner is required to obtain a permit. The permitting process encompasses site evaluation, approval of planning materials, and final inspection of OSSF construction.

Statewide Construction Code
The statewide construction code establishes a minimum standard for OSSF construction. The minimum code protects the public health and environment by matching the size and type of the OSSF to the soil and site characteristics.

Inspections/monitoring
All new construction is inspected and approved by a trained inspector. Additionally, the performance of more complex commercial OSSFs is periodically monitored by trained professionals and reported to the regulatory authority.

Training and licensing of OSSF Professionals
Texas has a formal licensing program for the OSSF professionals identified below.

> Designated Representative (DR) - Trained to review OSSFs, inspect construction, and initiate corrective action for failing systems;
>
> Site Evaluator - Trained to evaluate soils and site characteristics;

Installer I - Trained to install basic septic tank and drainfield systems;

Installer II - Trained to install complex OSSFs; and

Maintenance Provider - Trained to maintain individual wastewater treatment plants used in OSSFs.

All of the training of licensed individuals is conducted by third parties, with TCEQ review and approval of the trainers and course materials.

Enforcement

TCEQ and local governments primarily pursue enforcement for failing OSSF through local courts. Revocation and suspension of licensees is performed through the TCEQ.

TCEQ Edwards Aquifer Protection Program

The State of Texas contains only one designated sole-source aquifer, the Edwards Aquifer found in the central and south central portion of the state. The Edwards Aquifer is an arcuate band of limestone and associated formations that stretch from Bell County through Williamson, Travis, Hays, Comal, Bexar, Medina, and Uvalde counties, finally terminating in Kinney County. All of these counties, except Bell, are subject to TCEQ rules promulgated to protect the quality of groundwater within the aquifer.

The rules in 30 TAC Chapter 213 are the basis of the Edwards Aquifer Protection Program, administered by TCEQ's Border South Central Texas Area staff in the Austin and San Antonio Regional Offices. The program requires anyone who plans to improve land or build on the recharge, transition, or contributing zones of the Edwards Aquifer, to first have an application, including construction plans, approved by the TCEQ. After a plan is reviewed and approved by the regional office staff, the site is monitored for compliance.

The Edwards Aquifer rules are intended to mitigate NPS and point source impacts from regulated development over the recharge zone, transition zone and contributing zone of the aquifer, and, depending on location and type of development, may require any or all of the following:

- a water pollution abatement plan (WPAP) for any regulated activity proposed on the Edwards Aquifer recharge zone. This includes any construction-related activity on the recharge zone, such as, but not limited to, the construction of buildings, utility stations, roads, highways, railroads; clearing, excavation, or any other activities that alter or disturb the topographic, geologic, or existing recharge characteristics of a site; or any other activities which may pose a potential for contaminating the Edwards Aquifer and hydrologically connected surface streams;
- an organized sewage collection system (SCS) plan for any public or private sewerage system for the collection and conveyance of sewage to a

treatment and disposal system that is regulated pursuant to rules of the commission and provisions of TWC, Chapter 26. A system includes lift stations, force mains, gravity lines, and all appurtenances necessary for conveying wastewater from a generating facility to a treatment plant;

- an Underground Storage Tank (UST) facility plan for the installation or replacement of underground storage tanks or piping on either the recharge or transition zones of the Edwards Aquifer. In particular, storage tank (aboveground or underground) facilities that will store 500 gallons or more of static hydrocarbons or hazardous substances are regulated; and
- an aboveground storage tank facility plan for the installation of permanent aboveground storage tanks at a facility that will have a total capacity of 500 gallons or more on either the recharge or transition zones of the Edwards Aquifer. In particular, aboveground storage tanks that will store static hydrocarbons or hazardous substances are regulated.

TCEQ Border Affairs Program

Border Programs

Urban populations are growing rapidly in the border region, exceeding growth throughout the rest of the state and much of the nation. The McAllen-Edinburg-Mission area is the fourth-fastest growing metropolitan statistical area in the U.S. On the Mexican side of the border, population is rising even more quickly, expanding by almost 50% in the past ten years. With this boom have come both an increased demand for water supplies and a strain on communities' water, wastewater, and waste management infrastructure.

The region's economy depends on agriculture, ranching, oil and gas production, trade and commerce, industry, and tourism. Agriculture is particularly important in the Lower Rio Grande Valley of South Texas, where elevated levels of salinity in surface water are threatening the livelihood of farmers. Per capita income is lower in the border region than other parts of Texas as a whole. Lower income results in fewer tax dollars for local governments to meet existing needs, to keep up with rapid growth, or to plan for the future. Communities are challenged to do more with less. One of the greatest threats to water quality is the lack of sufficient water and wastewater infrastructure to keep pace with border growth. A lack of adequate service increases the likelihood that raw sewage or poorly treated water can enter the river, elevating bacteria levels and the risk of contracting water-borne diseases like hepatitis A. Raw sewage, wastewater, and agricultural activity can also increase levels of nutrients in the river. Elevated nutrient concentrations encourage algal growth and decrease dissolved oxygen. Low dissolved oxygen endangers aquatic plants and animals.

In addition to the need for adequate infrastructure, water quantity problems also affect water quality in the Rio Grande. The less water available, the more concentrated pollutants can become in the river, and the less suitable the water becomes for municipal and agricultural use. Groundwater throughout the border

region is threatened by increasingly high salt content. Overuse of a groundwater resource depletes water and increases movement of brackish water that requires more extensive treatment to meet drinking water standards. Other causes of high salinity include leaching of salts left in the soil by previous irrigation and seepage of oil-field brines into the ground. Pesticide residues can also travel into an aquifer with irrigation runoff or seepage into the soil.

Border growth also impedes communities' ability to manage the disposal of solid and hazardous wastes. Limited disposal options leads to an increase in illegal dumping. Improper disposal of used tires is a major concern in the region. Hazardous waste transportation is also a concern in border port-of entry cities, where chemical spills pose a potential threat to public health and water supplies. The following is a discussion of some of the programs in place to deal with the issue of water quality in the border region.

The TCEQ Border Initiative

In 2008 the TCEQ began a comprehensive border initiative, integrating all of the agency's border programs, including stand alone programs and those undertaken cooperatively with local, state, and federal partners. Under this effort, there are various water and wastewater programs. These include: a binational watershed protection pilot program, working with U.S. and Mexican stakeholders on the Rio Grande downstream of Falcon Dam; participating in a multi-state salinity management program in the Upper Rio Grande; and a study with other stakeholders to explore using flow-release schedules on the Rio Grande to maintain channel capacity, minimize flooding, and benefit aquatic habitat.

The Border Environment Cooperation Commission/North American Development Bank

The Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADB) were created through a U.S.-Mexico side agreement in 1993 to certify and finance water, wastewater, and solid waste projects along the entire U.S.-Mexico border. As of March 2010, the BECC had certified 47 projects in the 100 kilometer border zone in Texas, with a total value of $847 million. The vast majority are water and sewer projects.

Friends of the Rio Grande

One of the goals of the International Boundary and Water Commission U.S. Section (IBWC) CRP is to promote environmental awareness through public education and outreach. TCEQ and the USIBWC CRP have teamed together to form an initiative called Friends of the Rio Grande. The goals of this initiative are to increase public outreach programs throughout the border region, implement a volunteer monitoring program in cooperation with Texas Stream Team, promote environmental clean ups in the basin, and to provide recognition of outstanding efforts in environmental activities to encourage greater participation in environmental awareness.

TCEQ Boat Sanitation Program

The TCEQ implements the requirements of 30 TAC Chapter 321, Subchapter A relating to boat sewage disposal. These rules identify which boats must have Marine Sanitation Devices (MSDs) installed, specification and certification requirements (including fees and renewals) for MSDs and boat pump-out stations, and disposal methods for contents of MSDs and boat pump-out stations. The rules also designate which waterways in Texas are designated as no discharge zones, which are bodies of water into which the disposal of sewage (treated or untreated) is completely prohibited.

TCEQ 401Certification Program

CWA §401 ensures that federal discharge permits are consistent with the TSWQS. Under CWA §401, states are given the authority to review federally permitted or licensed activities that may result in a discharge of pollutants to waters of the U.S., such as the discharge of dredge or fill material.

Any federally authorized activity that may result in a discharge is subject to CWA §401 certification. The most common type of permit subject to CWA §401 certification is the U. S. Army Corps of Engineer's CWA §404 permit for discharges into jurisdictional waters of the U.S. Applicants for CWA §404 permits are asked to avoid impacts to waters of the U.S. where possible; to minimize impacts where avoidance is not possible; and compensatory mitigation is required for unavoidable impacts. Wetland and stream mitigation can take place at mitigation banks, through in-lieu fee programs, or through permittee-responsible mitigation. State and federal regulations have set a goal of *no net loss* of wetland functions and values.

Before issuing a federal permit in Texas, the permitting agency must receive from TCEQ or the RRC a certification, conditional certification, or waiver stating that the discharge will not violate the TSWQS. If the state denies certification, the federal permit is also denied. The TCEQ is responsible for certifying federal permits in Texas, except for those related to oil and gas exploration, development, and production, which are certified by the RRC. The RRC certified permit activities include dredging an access channel to conduct drilling or production operations in a critical area; construction of a drilling pad or installation of a production platform in a critical area; or construction, operation, or maintenance of a crude oil or natural gas pipeline facility in waters in the state. Examples of TCEQ 401 certification projects include roads, reservoirs, shoreline stabilization, and commercial and residential developments. Short-term and long-term BMPs for soil stabilization, erosion control, and sedimentation control are typically recommended for projects during the 401 review.

The CWA §401 certification program also plays a role in protecting coastal resources under the Texas CMP. The CMP is designed to accomplish the goals set by the state legislature for coastal resource protection and to meet specific

requirements for an approved plan under the federal CZMA. Certain activities, such as discharges authorized by CWA §404 permits, must be consistent with the state CMP when they occur within the coastal zone boundary and the CMP delegates some coastal consistency reviews to the two §401 agencies.

TCEQ Industrial and Hazardous Waste Permits Program

TCEQ permits for industrial and hazardous waste management units, and municipal solid waste disposal facilities contain provisions designed to protect groundwater and surface water from the effects of small levels of contaminants that may escape from a unit. These provisions include pond linings, numerous monitoring points, filter strip areas, leak detection systems for piping and other measures.

Remediation of Contaminated Sites

Environmental contamination can occur in many ways. Some examples include unreported spills of hazardous materials, undetected leaks from pipes or other malfunctioning industrial equipment, improper disposal of byproducts of industrial processes, abandoned municipal solid waste landfills, and abandoned, inactive industrial sites. If not remedied, ground and surface water contamination may occur, which can pose environmental and human health problems.

TCEQ Superfund Program

The state Superfund program remediates abandoned or inactive sites within the state that pose an unacceptable risk to public health and safety or the environment, but which do not qualify for action under the federal Superfund program. The state Superfund program is administered by the TCEQ.

The TCEQ manages or provides management assistance to the U.S. EPA with regard to the Superfund remediation process, after the site is identified as being eligible for listing on either the state Superfund registry or the federal National Priorities List. The TCEQ ensures that all Superfund activities are completed in a timely and efficient manner, and in accordance with all applicable state and federal laws and rules.

TCEQ Brownfields Program

In Texas, many former industrial properties lie dormant or underutilized due to liability associated with real or perceived contamination. These properties are broadly referred to as brownfields. The TCEQ, in close partnership with the EPA and other federal, state, and local agencies, facilitates cleanup, transferability, and revitalization of brownfields. This is accomplished through the development of regulatory, tax, and technical assistance tools. In addition, the TCEQ is available to provide local government's technical advice, education, and project

partnering for brownfields redevelopment projects free of charge.

Voluntary Cleanup Programs

The Texas Voluntary Cleanup Program (VCP) provides administrative, technical, and legal incentives to encourage the cleanup of contaminated sites in Texas. Non-responsible parties, including future lenders and landowners, receive protection from liability to the state of Texas for cleanup of sites under the VCP. Therefore, constraints for completing real estate transactions at those sites are eliminated. Also under the VCP, site cleanups follow a streamlined approach to reduce future human and environmental risk to safe levels. As a result, many unused or under used properties may be restored and become economically productive and beneficial to the community.

TCEQ Corrective Action Program

The mission of the industrial and hazardous waste corrective action program is to oversee the cleanup of sites with soil and groundwater contamination from industrial and municipal hazardous and industrial non-hazardous wastes. This program is administered by the TCEQ. The goal of this program is to assure that the public is not exposed to hazardous levels of chemicals by requiring mitigation, and the removal of contamination to levels protective of human health and the environment.

TCEQ Leaking Petroleum Storage Tank Program

The TCEQ is responsible for administering the leaking petroleum storage tank (PST) program. The program mission is to oversee the cleanup of spills from regulated storage tanks by recording and evaluating all reported incidents of releases of petroleum and other hazardous substances from underground and above-ground storage tanks. The program goal is to assure that the public is not exposed to hazardous levels of contamination by requiring the removal of contamination from PSTs to levels protective of human health and the environment.

TCEQ Underground Injection Control Program

Injection wells are facilities that dispose of waste by pumping the materials underground. All injection wells in Texas are regulated by either TCEQ or the RRC. Injection wells are classified into five different types:

- Class I wells, which are used for deep injection, are regulated by the TCEQ. (The RRC reviews and comments on these applications.);
- Class II wells, which are related to energy byproducts, are regulated by the RRC. (The TCEQ reviews and comments on these applications.);
- Class III wells, which are used to extract minerals other than oil and gas, are regulated by the TCEQ or the RRC, depending on the type of well;

- Class IV wells are generally banned, but may be authorized by the TCEQ or the EPA in certain environmental cleanup operations; and
- Class V wells, which are used for many different activities, are regulated by either the TCEQ or the RRC, depending on the type of well.

A few examples of injection wells regulated by the TCEQ are:

- wells that inject municipal, industrial, or hazardous wastes into a layer that is below the lowermost underground source of drinking water;
- wells that inject fluids to extract uranium or sulfur and to dispose of waste byproducts from the mining operation; and
- any well or similar apparatus that releases a liquid or liquids into or above an underground source of drinking water.

TCEQ Emergency Response Program

TCEQ provides monitoring, oversight, and technical and regulatory help through its emergency-response team. TCEQ personnel provide technical and regulatory assistance in the management of wastes and other residual materials that result from spills within the agency's jurisdiction, which also includes management of industrial and municipal solid wastes and hazardous wastes. Technical assistance is provided in other related areas such as spill notifications, contingency-plan issues, cleanup levels, and in-state funded cleanups. The TCEQ and the Texas GLO jointly serve as the state's primary members of the federal Regional Response Team for the U.S. EPA's Region VI, and the TCEQ represents the state in matters related to inland spills or releases of oil, and inland or coastal releases of hazardous substances or other pollutants. The agency also responds to pollution events and the needs of local government, the regulated community, and the public associated with natural disasters. Assistance in emergencies includes:

- assisting water-supply officials in supplying drinking water and the return of systems to operation; evaluating water quality, assisting individuals in maintaining private water or sewer systems, and assessing damages to public drinking-water systems;
- informing and aiding the State Emergency Management Council on matters of flood-hazard areas, floodplain management, flood hydrology, engineering, dam safety, reservoir operation, water rights and uses, water quality, and management of hazardous waste;
- obtaining, analyzing, and interpreting meteorological and climatological data, and making forecasts in emergency situations when weather is a factor;
- making available the services of specialists (floodplain management, hydrology, meteorology, groundwater geology, water quality, dam safety, wastewater treatment, water rights and uses, management of solid waste—including hazardous and radioactive waste, and emergency response) that may be of assistance during a disaster;
- supplying spill-response maps as well as maps relating to flood-hazard

areas;
- supplying TCEQ data, including data from neighboring states and Mexico, needed for dealing with a disaster that transcends the boundaries of Texas;
- offering technical assistance to local governments in the physical siting of disposal facilities for debris, including municipal wastes, whenever a disaster generates or causes excessive amounts of such wastes;
- making available equipment from TCEQ regional offices, such as boats, generators, and vehicles with radio and cellular phone support;
- helping pay for cleanups as appropriate from funds under the TCEQ's statutory authority; and
- making available contracting resources for cleanups.

TCEQ Used Oil Recycling Program

Texas law prohibits dumping used oil on land or into sewers or waterways. This includes the use of used oil as a dust suppressant. Texas has also banned used oil filters from being placed in or accepted for disposal in a landfill. TCEQ requires all transporters, handlers, and collection centers for used oil to register with the agency and report annual quantities of used oil handled. A facility which accepts used oil from household do-it-yourselfers may be exempted from the state fee on the sale of new automotive oil.

TCEQ Municipal Solid Waste Permitting, Planning, and Reporting Program

TCEQ requires municipal solid waste facilities to obtain permits in Texas. These permits address aspects of the facilities including:

- location restrictions;
- lining requirements;
- leachate collection and removal systems;
- operating practices;
- groundwater monitoring requirements;
- closure and postclosure care requirements;
- corrective action provisions; and
- financial assurance.

The TCEQ is responsible for data assessment and planning for the management of solid wastes in Texas. To support these activities, the TCEQ collects and compiles data on the generation and disposal of municipal solid waste in Texas. Municipal solid waste is solid waste resulting from municipal, community, commercial, institutional, and recreational activities, including garbage, rubbish, ashes, street cleanings, dead animals, abandoned automobiles, and all other solid waste.

As part of its waste planning efforts, the TCEQ administers a Regional Solid

Waste Grants Program. The grants program supports regional solid waste management planning by the state's 24 regional Councils of Governments (COGs), as well as a pass-through grant program administered by the COGs to fund regional and local solid waste management projects. The COGs also use these funds to develop an Inventory of Closed Municipal Solid Waste Landfills.

Owners and operators of Municipal Solid Waste (MSW) landfills and other waste management facilities submit an annual report to the TCEQ each year, detailing the amount and types of solid waste managed and the remaining capacity of each facility. The data are compiled and published in an annual summary report titled Municipal Solid Waste in Texas: A Year in Review (TCEQ publication AS-187).

TCEQ Illegal Disposal Abatement Program

To successfully address illegal dumping problems, communities must develop long-term comprehensive solutions. The TCEQ has developed a model approach for use in developing solutions for illegal dumping and other municipal solid waste problems. This model approach focuses on developing and maintaining a program that includes the following four components:

> Garbage collection services - Provide residents with convenient and affordable ways to dispose of their garbage, such as citizen collection stations for rural communities.
>
> Public awareness campaigns - Increase public awareness on the health and safety hazards of illegal dumping and available legal options for garbage disposal.
>
> Cleanup of existing dumps - Clean up illegal dump sites to discourage other dumpers, who are attracted to these existing sites, and to improve the community's awareness of the problem.
>
> Enforcement - Increase the cost of illegal dumping through increased enforcement and more severe punishments for offenders.

The TCEQ has an extensive outreach campaign to address the issue of illegal dumping. The TCEQ also provides funding to COGs through the Regional Solid Waste Grant program. Funds for the grant program are generated by state fees on MSW disposed of at landfills. The COGs use the funds to develop an inventory of closed MSW landfills; conduct regional coordination and planning activities; provide technical assistance and informational programs pertaining to solid waste management; serve as central point of contact for solid waste management outreach, education, and training programs; maintain a regional solid waste management plan; and administer pass-through grant programs to provide funding for regional and local MSW projects.

TCEQ Tire Disposal Program

Scrap tires must be managed to prevent fires and control disease vectors (mosquitoes and rats). The toxic air pollutants from tire fires can become NPS water pollutants through atmospheric deposition. Prior to Texas' scrap tire management program, large illegal tire dumps often appeared on the beds and banks of streams, damaging riparian habitat. The TCEQ regulates the collection, processing and recycling/disposal of over 20 million tires discarded each year in Texas. Anyone who stores more than 500 scrap tires must register with the TCEQ as a scrap tire storage site. Scrap tires must be hauled by a registered transporter to either a permitted landfill or an authorized scrap tire facility. All facilities must keep manifest records showing the disposition of scrap tires.

Annual Enforcement Report

The Annual Enforcement Report provides the TCEQ Commissioners with key status and performance indicators about agency enforcement activities. State law requires the TCEQ to prepare an electronic enforcement report by December 1 each year that reports on the enforcement actions for each type of regulatory program in the agency. The enforcement report contains statistical indicators and a comparative analysis for the following enforcement related activities:

- number of investigations and complaints by program and region;
- number of notices of violation issued by program and region;
- number and type of enforcement actions and lists of each action denoting the regulated entity name and location by county and region;
- amount of penalties assessed, deferred, and required to be paid to General Revenue;
- supplemental environmental project costs, offsets, and descriptions;
- number and percentage of enforcement actions issued to persons who previously have committed the same or similar violations;
- number and percentage of enforcement orders issued to entities that have been the subject of a previous enforcement order;
- classification of violations as major, moderate, or minor;
- most frequently cited rules/statutes in enforcement actions;
- emissions events; and
- other information which the Commission deems relevant, including information on the results of enforcement actions (i.e., environmental benefit, pollutant reductions, etc.).

Citizen Complaints

Responding to complaints from the general public about alleged environmental violations is an important part of TCEQ's regional office responsibilities. Each complaint is assigned a priority status to ensure that staff responds to the most environmentally serious complaints first. TCEQ has established procedures by which staff will investigate complaints once the most appropriate course of action is determined. An investigation may take the form of an on-site inspection or

sampling.

Complaints are categorized as follows:

- conditions relating to air quality such as odor, dust, and smoke;
- conditions that create a potential to pollute the water or land;
- alleged violations of TCEQ permits or rules;
- smoking vehicles;
- spills; and
- other environmental concerns.

Matters not within TCEQ jurisdiction will be referred to the appropriate state agency. The TCEQ does not have the authority to regulate, enforce, or mediate private actions between citizens.

Citizen Collected Evidence

When a citizen believes someone is causing an environmental problem and possibly violating the law, the citizen can either file a complaint with the TCEQ, or submit information documenting the problem. The TCEQ executive director is authorized by statute to initiate an enforcement action based on information provided by a private individual (TWC, §7.0025; 30 TAC Chapter 70, §70.4).

It is important to note that a citizen who wants the TCEQ to use the information provided as evidence in an enforcement case cannot remain anonymous. Furthermore, the TCEQ rules do not authorize anyone to enter the property of another person for purposes of gathering information to document a violation. Finally, a citizen collecting evidence must use TCEQ protocols, procedures, or guidelines when collecting and submitting information or evidence. Protocols vary depending on the nature of the problem, for example, water quality sampling procedures are very different from nuisance odor evaluation. A sample without the proper chain of custody documentation will not be acceptable to the TCEQ.

The executive director may initiate an enforcement case based on the value and credibility of the information submitted.

Supplemental Environmental Projects

Supplemental Environmental Projects (SEPs) prevent or reduce pollution, enhance the quality of the environment, and increase environmental public awareness. The SEP program, administered by the TCEQ, provides the opportunity for the respondent in an enforcement action to negotiate an agreement to perform an SEP in return for a reduction in administrative penalties. Potential SEPs include cleanup of abandoned illegal dump sites; community household hazardous waste collections; purchase of Water Wise kits for local schools; and on-site pollution prevention projects that exceed regulatory

requirements.

TCEQ Occupational Licensing Program

The TCEQ Occupational Licensing section is dedicated to the protection of the environment and human health through the responsible licensing of individuals whose occupations may have an environmental impact. The section's duties include issuing new licenses, renewing licenses, training approval, and exam development. The following is a listing of licenses that the TCEQ issues:

- Backflow Prevention Assembly Tester (BPAT);
- Customer Service Inspector (CSI);
- Landscape Irrigator, Technician and Inspector;
- Leaking Petroleum Storage Tank (LPST) Corrective Action Specialist and Project Manager;
- MSW Operator;
- OSSFs, Including Septic Tanks;
- Smoke School: Visible Emissions Evaluators;
- Stage II Vapor Recovery Facility Representative & Approved Training Providers;
- Underground Storage Tank Contractors and On-Site Supervisors;
- Wastewater Operators;
- Wastewater Collection Operators;
- Water Operators; and
- Water Treatment Specialist (WTS).

Texas Water Development Board

The TWDB is the state's water planning and water project financing agency. It is responsible for collecting and disseminating water related data; assisting with regional water planning, preparing the State Water Plan and financing water and wastewater projects located throughout the state. Under the CWSRF, the TWDB provides loans that can be used for the planning, design and construction of wastewater treatment facilities, wastewater recycling and reuse facilities, collection systems, storm water pollution control, NPS pollution control, and estuary management projects.

The TWDB conducts an active groundwater resource assessment program. TWDB personnel have identified boundaries and various characteristics for all of the state's major and minor aquifers including geologic information, water availability, and recharge. In addition, the TWDB has identified the major entities using groundwater within each river basin, the aquifer(s) from which they pump, the quality of water being developed, and the quantity of water needed for a 50-year planning period. To accomplish this, the TWDB has been collecting data on the occurrence, availability, quality, and quantity of groundwater present and the current and projected demands on groundwater

resources. The statewide groundwater level measurement program, groundwater quality sampling program, and groundwater studies are vital to the state's regional water planning efforts.

The purpose of the ambient groundwater quality sampling program is to collect data to: 1) monitor changes, if any, in the quality of groundwater over time and 2) establish, as accurately as possible, the baseline quality of groundwater occurring naturally in the state's aquifers. TWDB conducts the groundwater quality monitoring program in accordance with procedures established in its Field Manual for Ground Water Sampling. It also obtains data collected by other entities that follow these and similar procedures, such as groundwater conservation districts, the U.S. Geological Survey, and other state and federal agencies.

Clean Water State Revolving Fund

Another funding tool available to Texas for NPS management is the CWSRF. The TWDB can provide loans for NPS pollution abatement projects through the CWSRF at below market interest rates. Loans can be made to towns, counties, conservation districts, and other political subdivisions, as well as private individuals and non-profit organizations. The CWSRF program requires that interested parties submit information about their projects to be considered for inclusion on an annual project priority list. CWSRF projects are selected for funding on the basis of a priority rating system. Some of the activities that are eligible for funding include agricultural, rural, and urban runoff control, estuary improvement, NPS education and wet weather flow control including storm water and sewer overflows that are not associated with a TPDES permit. CWSRF loans that are provided from non-federal sources can be used as eligible match to CWA §319(h) grant funds. More information on the CWSRF can be found at *http://www.twdb.state.tx.us/financial/programs/cwsrf.asp*.

The Agricultural Loan Program

The TWDB provides grants and loans for agricultural water conservation equipment and practices which promote, demonstrate, or evaluate more efficient use of irrigation in agriculture. Grants are available to political subdivisions and state agencies. Loans are also available to political subdivisions and individuals through political subdivisions or a linked deposit program. The use of more efficient irrigation practices can reduce agricultural NPS loadings in surface and groundwater.

The Economically Distressed Areas Program

The Economically Distressed Areas Program (EDAP), administered by the TWDB, provides financial assistance in the form of a grant, a loan, or a combination grant/loan to bring water and wastewater services to economically

distressed areas, where present water and wastewater facilities are inadequate to meet the needs of residents. To be eligible for the program, projects must be located in economically distressed areas within affected counties and/or be located next to an international border. The EDAP will fund construction, acquisition, or improvements to water supply and wastewater collection and treatment works, including all necessary engineering work. The program also includes measures to prevent future substandard development.

Texas Groundwater Protection Committee

Coordinating the state's groundwater protection efforts is the task assigned to the TGPC. Created by the Texas Legislature's House Bill 1458 in 1989, the TGPC bridges the gap between state groundwater programs, improves coordination between member agencies, and works to protect groundwater as a vital resource.

The committee is chaired by the TCEQ. The TWDB serves as vice-chair, with the RRC of Texas, the Texas DSHS, T-exas Department of Agriculture (TDA), the TSSWCB, the Texas Alliance of Groundwater Districts (TAGD), Texas AgriLife Research, BEG, and the Texas Department of Licensing and Registration (TDLR) rounding out the membership roll.

The TGPC implements the state's groundwater protection policy which:

- calls for non-degradation of groundwater ;
- requires that pollution discharges, waste disposal, and other regulated activities not harm public health or impair current or potential groundwater use;
- recognizes the variability between aquifers;
- acknowledges the importance of water quality;
- balances the protection of the environment and the long-term economic health of the state; and
- recognizes the use of the best professional judgment of the responsible state agencies to implement the policy.

Nonpoint Source Task Force

The TGPC reactivated the Nonpoint Source Task Force in 2010. The primary goal of the NPS Task Force is "to prevent and abate NPS pollution of groundwater." In order to accomplish this, the Task Force provides recommendations and serves as the primary mechanism for strategizing a coordinated approach for preventing and addressing NPS groundwater pollution in the state.

Groundwater Research Subcommittee

The Research Subcommittee acts as a formal mechanism for identifying interagency research needs and providing a coordinated approach for discussion with potential funding sources. The Subcommittee identifies projects where

shared resources could support research to solve problems that are common to many committee members, including identifying opportunities for cooperatively applying to federal agencies for pass-through monies. The subcommittee facilitates cooperation by identifying ways to join research forces with state or federal agencies and local governmental entities.

Public Outreach and Education Subcommittee

The primary goals of the Subcommittee are to develop and implement educational outreach programs for landowners concerned with groundwater protection and environmental health issues and to facilitate interagency communication and coordination to provide support for landowner educational outreach projects. Activities include developing educational materials, coordination of outreach programs and special projects with a focus on the NPS related issues of abandoned well closure, OSSF maintenance, domestic drinking well sampling, and the Texas Well Owner Network (TWON) which is a groundwater quality protection program.

Agricultural Chemicals Subcommittee

State law requires the TCEQ with advice of the TGPC, to develop plans for the protection of water quality and management plans for the prevention of water pollution by agricultural chemicals. The TGPC formed the Agricultural Chemicals Subcommittee to address this statutory provision to assist in the development of the *State Management Plan for the Prevention of Pesticide Contamination in Groundwater*. This plan, completed in 2001, is currently being implemented by multiple state agencies with the assistance of the Agricultural Chemical Subcommittee.

Texas Parks and Wildlife Department

The TPWD's primary functions are to manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing, and outdoor recreation opportunities. Many natural resources depend on clean water in the state's rivers, lakes, and coastal waters. The TPWD participates in the state's NPS program and implements many programs that support the NPS program goals.

To this end, TPWD operates and maintains a system of public lands, including state parks, historic sites, fish hatcheries and wildlife management areas; monitors, conserves, protects and enhances the state's fish and wildlife resources; regulates and enforces commercial and recreational fishing, hunting, boating and nongame laws in the state; monitors, conserves and enhances the quality and quantity of rivers, streams, lakes, coastal marshes, bays, beaches, gulf waters and other aquatic and wildlife habitat; informs and educates the public regarding laws and rules regulating fish, game/nongame wildlife and environmental habitats, boating safety, firearm safety for hunters, fish and wildlife conservation

and outdoor recreation in general; and provides direct matching grants to local political subdivisions and non-profit entities for planning, acquisition or development of local parks, recreational facilities, and for recreation, conservation and education programs for underserved populations.

The 2010 Land and Water Resources Conservation and Recreation Plan guides the agency in conserving the state's natural and historic heritage and in providing public access to the outdoors. It serves as a tactical document that guides planning, operational and budget decisions.

Kills and Spills Team

The TPWD has assembled a Kills and Spills Team (KAST) comprised of biologists and team members headquartered in and assigned to five regions across Texas. The KAST assumes four key responsibilities: 1) respond to fish and wildlife kills and pollution incidents, including oil and hazardous material spills; 2) minimize environmental degradation resulting from pollution incidents and fish and wildlife kills; 3) obtain compensation, repair, and restoration for environmental damage; and, 4) act as a technical resource with respect to relationships between water quality, habitat, and living organisms.

Approximately half of the incidents the KAST team responds to are fish kills. Natural causes responsible for fish kills include extreme weather temperatures, bacteria and disease, and toxic algal blooms. The actions of humans can result in fish and wildlife kills through the introduction of toxic chemicals, pesticides, fertilizers, and contaminated storm water runoff. Low dissolved oxygen concentration is another cause of fish kills. Low dissolved oxygen concentrations may be natural or man-induced. Low dissolved oxygen can result from plant respiration depleting oxygen levels during the night. Other causes of low dissolved oxygen include excessive decay during hot, still days, dams, and dead end canals.

A fish or wildlife kill is physical evidence that something is wrong. The sooner it is reported, the sooner it can be investigated and remedied. Immediately after a kill or spill is reported, an investigation is begun to determine the source of a spill or the cause(s) of a kill. Though differences exist between investigating fish and wildlife kills and spills, the need for prompt response and accurate analysis applies in either case. Crucial details can be lost in a short amount of time. In addition, factors that may seem insignificant such as weather, vegetation, algal blooms, water chemistry, water flow, and pollution, can have serious impacts to an ecosystem when they change rapidly. Therefore, TPWD biologists must pay close attention to details, follow proper sampling procedures, and keep valid records. For large pollution events, TPWD biologists often work together with other state and local authorities.

Often in the case of a kill or spill, a responsible party is identified as having caused the incident. The responsible party may be asked to make restitution for

the ecological damages. Restitution may consist of a monetary reimbursement for the value of fish or wildlife killed, or may be some project that restores value to the ecosystem.

Private Lands and Habitat Program

The goal of the Private Lands and Habitat Program is to provide advice and information to land managers interested in managing natural resources on their property. This program seeks to answer landowner questions regarding the conservation and development of wildlife habitat and the proper management of the various wildlife populations which utilize that habitat, from producing quality whitetail deer to increasing songbird diversity. Through this effort, TPWD hopes to slow or reverse the decline in quantity of the state's wildlife habitat and improve the quality of remaining habitat. TPWD biologists promote management practices which will maximize wildlife potential, prevent waste or depletion of the resource, provide aesthetic and economic benefits to the landowner, and offer increased opportunity for public use and enjoyment of renewable natural resources.

The Texas Wetlands Conservation Plan

Ninety-seven percent of Texas' land is privately owned and managed. Management decisions on these lands are made by private landholders. Economics often dictate what these management strategies will be. The Texas Wetlands Conservation Plan focuses on providing private landowners with information to assist them in making informed, economically beneficial management decisions, which will protect wetland functions and maximize the benefits that wetlands provide. Development of the Wetlands Conservation Plan was coordinated by the TPWD and is intended as a guide for wetlands conservation efforts throughout the state.

The Texas Wetlands Conservation Plan, initiated in April 1994 and updated in 2007, focuses on non-regulatory, voluntary approaches to conserving Texas' wetlands. It has three major goals: to enhance the landowner's ability to use existing incentive programs and other land use options through outreach and technical assistance; to develop and encourage land management options that provide an economic incentive for conserving existing or restoring former wetlands; and to coordinate regional wetlands conservation efforts. Wetland issues addressed in the Plan fall into five general categories: education; economic incentives; statewide and regional conservation; assessment and evaluation; and coordination and funding. The Plan, in addition to providing general information and goals, highlights many specific recommendations to enhance wetlands conservation in Texas. To date, a shortage of funding has slowed implementation of recommendations identified in the Plan.

Seagrass Conservation Plan

The Seagrass Conservation Plan was developed to address seagrass problems in Texas. The TCEQ, GLO, and TPWD endorsed conservation goals for the Seagrass Plan, which include defining seagrass research needs, addressing management concerns, and expanding environmental awareness in citizens through education.

Conservation Plan for State-Owned Coastal Wetlands

The State Wetlands Conservation Plan for State-Owned Coastal Wetlands provides protection through specific actions for state-owned coastal wetlands. The TPWD and the GLO, with assistance from other agencies, are jointly developing this legislatively required plan. Eighteen specific items/actions must be included in the plan. Some of these actions include a goal of no overall net loss of state-owned wetlands, wetland mitigation policies, a requirement for freshwater inflows to estuaries, a navigational dredging and disposal plan, education and research regarding boating in wetlands, the reduction of NPS pollution, improved coordination among federal and state agencies, and a plan to acquire coastal wetlands.

Wetlands Assistance for Landowners

In 1995, a *Wetlands Assistance Guide for Landowners* was published by TPWD and describes the programs, regulations, and conservation options that affect landowners in Texas. The Landowner's Guide summarizes existing state, federal, and private programs which provide financial and technical assistance for wetlands protection. Other topics discussed include an assessment of landowner options for wetlands protection, a summary of existing state and federal regulations affecting wetlands, a list of contacts, and a description of the roles of state and federal agencies which are involved in wetlands regulation and management.

Coastal Habitat Restoration

TPWD has an active program to restore wetlands along the Texas Coast. These marsh restoration projects reestablish intertidal marsh, high marsh, seagrasses, and sand flats along bay shorelines that have subsided and are suffering from severe erosion. These restored marshes buffer shorelines from erosion and remove both sediments flowing into the bays and sediments that have been re-suspended by dredging, boating activities, and storms. These wetlands also help remove nutrients from storm water runoff. These newly created and restored marshes provide habitat for a wide variety of ecologically and economically important marine life. These restoration projects involve multiple local, state, and federal partners to leverage state and local funds. Citizens also assist by replanting the marshes. The partnerships and public involvement in these projects facilitates awareness of the habitat values and increases public stewardship of these coastal habitats.

The Texas Wildscapes Program

The Texas Wildscapes Program emphasizes providing the basics for good habitat: food, water, and cover. With approximately 95% of Texas land use practices in the hands of private landowners, the importance of education toward a common bond is evident. The Wildscapes Program provides educational materials for the Texas urban residential landowner to promote a better-educated population which is more supportive of wildlife and conservation issues. The Texas Wildscapes Program can also be applied to community, rural, and corporate properties. The program introduces the concept of habitat, and provides information to the public regarding wildlife needs and the importance of landscaping with native plants. The program also promotes minimizing the use of pesticides and fertilizers, xeriscaping, mulching, composting, and watering practices to conserve water.

Freshwater Habitat Protection and Restoration

TPWD has recently initiated a program to restore and maintain freshwater aquatic habitats to support healthy, sustainable ecosystems throughout Texas. Aquatic habitat degradation and loss have profoundly detrimental effects on ecosystem health and resiliency. Currently, more than 40% of fish and mussel taxa in Texas are listed as imperiled and several species have already been lost to extirpation or extinction. These losses can be ameliorated by ensuring natural physical processes and habitat quality throughout watersheds.

TPWD helps to protect these habitats by providing technical support and review of projects associated with water development, water planning, and water quality issues. Partnerships have been developed to conserve aquatic, riparian and upland habitats essential to environmentally and economically healthy watersheds that benefit the natural resources of the state. This is achieved through: 1) promoting awareness and stewardship of fish and freshwater aquatic habitats; 2) establishing and nurturing local partnerships to identify conservation priorities and leverage available resources; 3) providing technical guidance and planning assistance; and 4) organizing community involvement in local fish habitat conservation projects. Proper watershed management helps to raise public awareness of the value of our state's natural resources and provides quality recreational opportunities to citizens of Texas.

Texas Department of Agriculture

The TDA is the state's lead regulatory agency for agricultural, structural, and vector pesticide regulation. Texas statutes grant TDA the authority to enforce provisions relating to the registration, distribution, and use of all agricultural, structural and health related vector pesticides. TDA is responsible for licensing all pesticide applicators and the labeling, storage, sales, usage, and disposal of all

pesticides. TDA also cooperates with other state agencies that have statutory pesticide responsibilities, such as TCEQ. TDA is also responsible for the enforcement of federal pesticide laws under a cooperative agreement with the EPA. TDA continues to proactively engage state and federal agencies to review and keep current with issues involving the protection of water quality from pesticides. TDA is also working on issues involving risks from other contaminants as well as state water conservation and planning efforts.

Pesticide Management

Texas Pesticide Laws define a pesticide as a substance or mixture of substances intended to prevent, destroy, repel, or mitigate any pest, or any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant. Pesticide contamination occurs as a result of improper use, over use, spills, improper storage, and disposal. Pesticides may enter surface water bodies and aquifers through wastewater treatment plants, runoff from sites such as farms, golf courses, parks, highway right-of-ways, lawns and gardens; and atmospheric deposition. According to a USGS study of 48 drinking water reservoirs in Texas (September 2000), pesticides most frequently detected in Texas drinking water reservoirs included atrazine, diazinon, metolachlor, and simazine. EPA has identified pesticide contamination as a nationwide problem in surface and ground water. In response, there has been a coordinated state effort to monitor pesticides and define roles and responsibilities in responding to the water quality effects of possible pesticide contamination.

In addressing pesticide contamination several major principles are taken into account. Agricultural pesticides are beneficial and important to the production of food and fiber, and are of significance to the state economy. However, the use of pesticides should not impair any use of waters of the state or cause a public health hazard. Drinking water supplies, both groundwater and surface water, should especially be protected. State and local government should be the first line of protection, their efforts being complemented by federal expertise and information. Efforts in Texas in addressing these issues include, for groundwater, the adoption of the *Groundwater Pesticide Management Plan* and, for surface water, the incorporation into the Management Program, of a similar set of protective management measures. These surface water pesticide management measures were primarily developed with the guidance of the Texas Watershed Protection Committee (TWPC).

Surface Water Pesticide Management

The goal of surface water pesticide management is to provide a mechanism for protection of surface water from pesticide contamination. This goal subscribes to unimpaired use of surface water, allowing for the normal use of pesticides without impairing surface water quality or posing a public health hazard. All used and potentially usable surface waters are subject to the same protection afforded

by the antidegradation policy goal. This level of surface water protection complements the protection of groundwater influenced by surface water.

Pesticide contamination of surface water is detected through the state's assessment process. Public water supplies are regularly monitored by the Public Drinking Water Section of the TCEQ. NPS pollution resulting from pesticides is managed through prevention and response to contamination. The TWPC coordinates these activities.

Prevention and Mitigation

The TWPC recommends and coordinates a five tiered approach for prevention of pesticide contamination.

General Education - Current and updated information is shared statewide to raise and maintain awareness of the potential for pesticide contamination. Presentations, brochures, displays, and slide presentations are the tools used to raise awareness. These materials are created and distributed throughout the state by the cooperating agencies of the TWPC.

Education Focused on Affected Water Bodies - Educational efforts will be expanded in areas where a surface drinking water source is identified as affected by specific pesticides. This effort will be applied even though monitoring has not shown contamination beyond the MCL. Dissemination of information will be through public presentations, articles in newsletters, and advertisement of available educational literature.

Education and Application of BMPs in Areas with Lower Levels of Pesticides - Where monitoring has revealed contamination of surface water used as a drinking water source, but at concentrations lower than the pesticide MCL or Health Advisory Level (HAL), a voluntary BMP program will be encouraged. Furthermore, cooperating agencies may take additional action through their standard education programs.

Education and Application of BMP's in Areas with Higher Levels of Pesticides - In a surface water body used as a drinking water source, where monitoring has revealed a NPS contamination by a pesticide at levels greater than the MCL or HAL, a voluntary education and BMP program will be initiated. If there is no evidence of sufficient improvement, use restrictions will be implemented.

Pesticide Use Restrictions - If all previous levels of preventive measures fail, the final recourse will be use restriction of the pesticide in the water body which is contaminated. Such actions will be implemented by the TDA after consultation with the other involved agencies through the TWPC. Users will be notified of the restricted use status of the pesticide in their area.

Response to Contamination

The response to contamination of surface water by pesticides falls under the jurisdiction of several agencies. Pesticide runoff is typically treated as agricultural NPS pollution therefore; the TSSWCB and TDA play a key role in response. The TCEQ SWAP program provides response assistance when the water body is a drinking water supply. The TDA, the lead regulatory agency for pesticides, provides expertise on pesticide regulation and education. When pesticide contamination results in a surface water body not meeting standards the response is addressed through the TMDL process. When the pesticide contamination does not result in a standards violation, response occurs through the preventive actions described above and, if the local entity responsible for the affected water body chooses to participate, through the TCEQ's SWAP program. The TWPC coordinates all responses to pesticide contamination to ensure that the responsible agencies or programs are notified and take appropriate action.

Pesticide Review Program

The EPA reviews and registers pesticides to ensure they meet current scientific and regulatory standards. Through this process consideration is made for human health and ecological effects of pesticides. The EPA issues risk management decisions based on the reviews that may result in registration eligibility, risk reduction measures, or elimination of uses. Risk factors that are analyzed include risks to workers, risks associated with residential uses, and risks affecting drinking water. Measures used to address risks include requiring intensive monitoring programs, prohibition of use in specified geographic areas or watersheds, education programs to promote and ensure proper pesticide use and mitigation requirements. The State of Texas has developed programs to enforce and ensure compliance with this EPA program at the state level.

Agricultural Pesticide Regulation

The TDA is the state's lead regulatory agency for pesticide regulation. The Texas Pesticide and Herbicide Laws grant TDA the authority to enforce the provisions of the law pertaining to the registration, distribution, and use of all agricultural pesticides. TDA is responsible for licensing all agricultural pesticide applicators and labeling, storage, sales, usage, and disposal of all pesticides. TDA also cooperates with other state agencies that have statutory pesticide responsibilities, such as the TCEQ. TDA is responsible for the enforcement of federal pesticide laws under a cooperative agreement with the EPA.

The TDA cooperates with all agricultural producers and other users of pesticides to make certain that all pesticides are used safely and according to instructions. The Texas Pesticide Control Act requires that pesticides be stored in a manner that will reasonably ensure that human food, domestic and public water, pet

foods, drugs, animal feeds, commercial fertilizers, seeds, or clothing will not be contaminated. The law also directs that pesticide containers be disposed of as directed on the label or by any other methods approved by the TDA. Any use of pesticides inconsistent with label directions is a violation of the law and may subject the user to penalties under federal and state law.

The TDA is also responsible for developing and implementing the State of Texas Plan for Certification of Pesticide Applicators. All application equipment used by commercial applicators must be registered, and is subject to inspection at any reasonable time. The Texas AgriLife Extension Service is responsible for training in relation to the state pesticide applicator certification program.

Structural Pest Control Regulation

The Structural Pest Control Service (SPCS), within the Agriculture and Consumer Protection Division of TDA licenses and regulates pest management professionals, specifically those engaged in the business of structural pest control. SPCS enhances the educational and professional standards of license holders and ensure the health, safety, and welfare of the public. Formerly the Structural Pest Control Board, SPCS came under the authority of the TDA on Sept. 1, 2007. The bill that abolished the Board and brought the Service into TDA is House Bill 2458 of the 80th Legislature.

The SPCS is authorized by Texas Occupations Code, Chapter 1951 to promulgate rules and regulations governing the methods and practices pertaining to structural pest control to prevent adverse effects on human health and the environment. SPCS has established regulations, which authorize it to enforce label instructions approved by EPA and TDA regarding application, storage, and disposal of pesticides in the urban environment. Many label instructions contain information relating to proper application and disposal of pesticides to prevent surface water contamination.

In addition, the SPCS licenses businesses, certified commercial applicators, technicians, technician apprentices, certified noncommercial applicators, non-commercial technicians, and noncommercial technician apprentices in the structural pest control industry. The SPCS also has the authority to take action against any licensee for engaging in practices that could be detrimental to public health, safety, or the environment. The SPCS also has the authority to perform inspections to monitor pesticide use and investigate complaints regarding label violations.

Texas Institute for Applied Environmental Research

TIAER was established as part of The Texas A&M University System in 1992. The first mandate in its enabling legislation is to conduct applied research on environmental issues that have public policy implications. The legislation also

calls for TIAER to provide national leadership on emerging environmental policy and to provide a setting for environmental studies on the interface between government and the private sector. Establishing interdisciplinary programs or partnerships to develop and implement new policies, technologies, strategies, and relationships is another TIAER mandate.

The TIAER goal is to impact state and national environmental policy. A principal that is fundamental to this goal is that improvements in the environment are best accomplished not by simply conducting scientific research, but by using research results to formulate policy recommendations that will actually be implemented by government and other institutions. TIAER seeks to use cutting-edge strategies and technologies to assist developers and implementers of environmental policy. Partnerships with other universities and state agencies are integral aspects of Institute work. These partnerships build on the strengths of each entity to produce an effective, efficient program. TIAER provides technical services in the assessment and management of NPS pollution in Texas.

Texas Water Resources Institute

The Texas Water Resources Institute, part of Texas AgriLife Research, the Texas AgriLife Extension Service, and the College of Agriculture and Life Sciences at Texas A&M University, serves as the focal point, clearinghouse, partner, and facilitator for water research and educational outreach efforts throughout Texas and beyond. TWRI was designated as the water resources research institute for the state of Texas by the state Legislature in 1964. TWRI is one of 54 National Institutes for Water Resources. The following paragraphs summarize the TWRI programs related to managing NPS pollution.

Water Resources Research and Extension Collaborations

Working with university faculty and water resources professionals, TWRI helps address priority water resources issues in the state. TWRI collaborates through joint projects with universities; federal, state and local governmental organizations; and numerous others, including engineering firms, commodity groups and environmental organizations.

Best Management Practices Evaluation

BMPs evaluation programs at TWRI focus on research, demonstrations and educational projects that determine the best methods, processes or activities to improve and protect water quality. Many of the projects address agricultural and urban BMPs to reduce or prevent nonpoint source pollution; others focus on best practices to control or eliminate invasive species.

Watershed Assessment, Planning and Restoration

TWRI watershed assessment, planning and restoration programs work with stakeholders to assess watershed water quality throughout Texas and then develop and later implement plans to improve and protect water quality in the watersheds. These watershed projects use holistic, stakeholder-driven

approaches to develop WPPs to accomplish the water quality goals of the watershed.

Water Resources Training and Education

TWRI Water Resources Training Program markets and administers short courses on diverse water-related topics. The training courses provide water resources professionals with intensive, hands-on instruction on the latest technologies and products of university research. Other education programs work with stakeholders to increase knowledge and understanding on critical water quality and water quantity issues in Texas.

Texas Forest Service

The Texas Forest Service (TFS), a member of The Texas A&M University System, provides statewide leadership to assure that the state's trees, forest, and related natural resources are protected and sustained for the benefit of all.

Silvicultural Management

Texas has 60 million acres of forested land, more than any other state in the continental U.S. Twenty percent of this area, roughly 12 million acres, is considered commercial timberland. Most streams that originate or flow through these timberlands are sources of water supply, prime recreation, and other high quality uses. Because of this, forest management programs have been developed to implement adequate measures to protect water quality. Below are some of the programs in place to address the potential NPS problems resulting from improperly conducted silvicultural operations.

TFS Forest Resource Development and Sustainable Forestry Division

The TFS forest resource development and sustainable forestry division provides professional assistance to family forest owners, including services such as, development of forest management plans, assistance in implementation of reforestation and timber stand improvement practices, and control of forest insect and disease problems. It administers several state and federal cost share programs which promote reforestation and stewardship. Emphasis is placed on developing the state's timber resource in an environmentally sound manner to meet present and future needs.

The Forest Stewardship Program

The Forest Stewardship Program (FSP), a USDA Forest Service program, provides technical assistance, through State forestry agency partners, to non-industrial private forest (NIPF) owners. The program encourages and enables active long-term forest management. A primary focus of the program is the

development of comprehensive, multi-resource management plans that provide landowners with the information they need to manage their forests.

The Best Management Practices Program

The Best Management Practices program works to protect, conserve, and enhance water resources through the sustainable use of forestlands. This voluntary program accomplishes this objective through the development of science-based, non-regulatory BMPs, an aggressive education/technical assistance/outreach campaign, and a monitoring program designed to measure the implementation and effectiveness of these practices.

The Ecosystem Services Program

The Ecosystem Services program seeks to create a marketable value for the numerous benefits forests provide, generating additional revenue for landowners that will allow them to "keep their forests in forests." Conserving these working forest landscapes can enhance water resources, as well as lead to many other environmental benefits.

Texas AgriLife Research

Texas AgriLife Research is the state's premier research agency in agriculture, natural resources, and the life sciences. An agency of The Texas A&M University System, AgriLife Research collaborates with the Texas A&M University College of Agriculture and Life Sciences, the Texas AgriLife Extension Service, and others to help fulfill the A&M System's land-grant mission of teaching, research, extension, and service. Texas AgriLife Research provides technical services in the assessment and management of NPS pollution in Texas.

Texas AgriLife Extension Service

AgriLife Extension, an agency of The Texas A&M University System, provides quality, relevant, outreach and continuing education programs and services to Texans. AgriLife Extension serves every county in Texas; its information is provided by scientists and researchers at Texas A&M and other universities, and is made practical and relevant by Extension educators or agents who work in each county. AgriLife Extension continually assesses and responds to educational needs identified by community residents, advisory committee members, volunteers, stakeholder groups, and representatives of organizations and agencies. Extension education encompasses the broad areas of agriculture and natural resources, community economic development, family and consumer sciences, and youth development programs such as 4-H.

Among other goals and priority objectives pursued by AgriLife Extension, the following relate to agriculture and natural resources:

- consumers, homeowners, agricultural producers, communities, and irrigation districts understand and adopt BMPs to protect water quality and enhance conservation so water supplies will meet future water needs in Texas that are essential for expanding agricultural growth, jobs, and the economy in both rural and urban areas;
- landowners, professional ecosystem managers, community planners, and other interest groups become more knowledgeable, make informed decisions, and adopt BMPs that insure the proper management of rural and urban natural ecosystem resources through stewardship education in order to support the biological, sociological, and economic sustain-ability of those resources; and
- advance the planning and management of natural resource-based recreation opportunities in Texas.

Lone Star Healthy Streams Program

The goal of the Lone Star Healthy Streams (LSHS) Program is the protection of Texas waterways from bacterial contamination originating from livestock operations and feral hogs. To achieve this goal, LSHS's objective is the education of Texas farmers, ranchers, and landowners about proper grazing, feral hog management, and riparian area protection to reduce the levels of bacterial contamination in streams, rivers, and other water bodies.

LSHS is implemented through a partnership between the Texas AgriLife Extension Service, TWRI, and the TSSWCB with CWA §319(h) grants from USEPA. The Program's major goal is the protection of Texas waterways from bacterial contamination originating from beef cattle, dairy cattle, horses, poultry, and feral hogs.

The framework for LSHS is five resource manuals that focus on bacterial runoff management for beef cattle, dairy cattle, horses, poultry, and feral hogs. As part of this education program, current and novel BMPs are being evaluated to provide important information regarding BMP effectiveness relative to implementation costs and pollutant load reduction. Through enhanced education regarding riparian protection and vegetation management on grazing lands, LSHS will further protect Texas waterways from sediment, nutrient, and pesticide runoff with the concomitant loss of water and topsoil. LSHS is the state's primary coordinated and comprehensive educational program to address NPS pollution and water quality impacts from livestock operations and feral hogs.

Texas Well Owner Network

Over 1,000,000 private water wells in Texas provide water to citizens in rural areas and increasingly to those living in small acreages at the growing rural-urban interface. Private well owners are independently responsible for

monitoring the quality of their wells and are at a greater risk for exposure to compromised water quality.

TWON is a science-based, community-responsive education curriculum focused on educating private well owners about potential pollutant sources and what steps can be taken to protect groundwater quality and aquifer integrity. TWON complements the Texas Watershed Steward Program. TWON offers training workshops and water well screening events. Participants will have a better understanding of the relationship between actions on the land and the quality of groundwater available for drinking and irrigation.

TWON is implemented through a partnership between the Texas AgriLife Extension Service, TWRI, and the TSSWCB with CWA §319(h) grants from USEPA. The Program's major goal is the protection of private water wells resulting in averting transport of contaminants to surface waters, preventing contamination of underlying aquifers, and safeguarding the health of landowners and their families.

Texas Department of Licensing and Registration

The TDLR is charged to protect groundwater quality through the licensing of well drillers and assuring well construction standards are enforced. A Water Well Driller is defined as any individual who drills, bores, cores, or constructs a water well. A driller may include an owner, operator, contractor, or drilling supervisor. The program has a mandatory apprenticeship which requires all applicants to have at least two years of drilling experience before taking the licensing exam. TDLR has the power to suspend or revoke licenses and set administrative penalties for incompetence or violations of any section of Texas Occupations Code, Chapters 1901 and 1902 or any rule.

The Texas Legislature expanded the Water Well Driller functions to include pump installers that repair wells after they have been drilled. Pump Installers install and repair well pumps and equipment, locate and survey abandoned wells, and repair existing wells. Regulation of this function provides a mechanism to ensure that surface casing is completed on wells that were drilled before the rules on surface casing existed to prevent contamination of drinking water sources by improperly sealed wells.

Numerous state and local programs have identified abandoned water wells as having a significant, or potentially significant, negative impact on groundwater quality in the state. Abandoned water wells exist in every county and impact all of the state's aquifers. It is conservatively estimated that 150,000 of the wells drilled since 1965 are abandoned or deteriorated. Abandoned water wells not only serve as conduits or channels for contamination to reach groundwater, but large diameter wells can also be a hazard to human and animal life. In addition, uncapped, non-cemented, deteriorated, or uncased wells completed in more than one water-bearing zone may allow poorer-quality water from one zone to co-

mingle and impact the other(s). Abandoned municipal, industrial, irrigation wells and abandoned rig-supply, domestic or livestock wells, and unplugged test-holes also pose threats to groundwater quality.

State law requires landowners, who possess an abandoned or deteriorated well, to have the well plugged or capped under TDLR standards. The landowner is liable for any water contamination or injury due to such wells. The Abandoned Well Notification and Compliance Program, administered by the TDLR, compiles, identifies, and processes abandoned water well notification and enforcement cases. The TDLR can assess administrative and civil penalties against persons who do not comply with the provisions. Some groundwater conservation districts are implementing well-capping and plugging programs of their own.

Additionally, the Water Well Driller/Pump Installer Program provides advisories to water well drillers for areas with contaminant plumes or undesirable water quality. These advisories help water well drillers avoid impacting usable groundwater by unknowingly drilling through contaminated zones in the areas specified. Drillers are advised to case off and pressure grout those zones to prevent contaminant migration - another form of NPS pollution.

Texas General Land Office

The GLO is the state agency responsible for the management of state-owned public lands not specifically purchased by or deeded to other agencies. The GLO is a proprietary state agency. The GLO is also the state's lead agency for coordinating the Coastal Management Plan designed to help preserve public beach access, protect coastal wetlands and other coastal natural resources, and respond to beach erosion along the Texas coast.

Coastal Oil Spill Prevention and Response

The Oil Spill Prevention and Response Act of 1991 (OSPRA) designated the GLO as the lead state agency for preventing and responding to oil spills in the marine environment. A two-cent-per-barrel fee on crude oil loaded or off-loaded in Texas supports funding for the GLO's response efforts. To ensure rapid response, field offices are located along the Texas coast. In preparation for spills, the program has pre-staged response equipment in sensitive and geographically advantageous locations. The GLO's Oil Spill Prevention and Response (OSPR) program functions include deploying state-owned response equipment, designating responsible parties, coordinating spill response strategies, investigating the spill causes, and conducting follow-ups to ensure that appropriate corrective actions are identified and implemented. The program maintains a substantial inventory of response equipment.

The OSPR program maintains an active outreach effort, visiting schools,

associations, and interest groups. The outreach program emphasizes the environmental impacts of small, chronic spills. Pollution prevention methods are highlighted in every presentation. In addition, the OSPR sponsors the Clean Gulf Conference and Exhibition annually to bring experts from government and industry together to discuss the latest developments in oil spill technology and the issues facing both responders and industry.

The OSPR program has also completed construction of four bilge water reclamation facilities along the coast. The Oily Bilge Water Reclamation Facility Program deters disposal of bilge water containing oil directly into surface water by providing operators of pleasure and commercial boats with disposal facilities. In addition, the GLO has increased its presence with additional boat and harbor patrols. The OSPR program maintains a comprehensive, unannounced oil spill drill and audit program designed to measure the readiness level of all sectors of the oil handling community: deep draft vessels, pipelines, and shore-based facilities.

The OSPR program is one of only a few state programs in the nation that funds oil spill prevention and response-related research. The Shoreline Environment Research Facility (SERF) enables oil spill researchers to conduct biological and chemical experiments in nine tanks that are capable of simulating a variety of coastal environments. The American Petroleum Institute has conducted two of the first "field conditions" dispersant experiments at the SERF facility, and works with program personnel to perfect response strategies for maritime applications.

The Texas Automated Buoy System was developed to assist in predicting the movement of oil in offshore environments. Nine offshore buoys transmit real time ocean current data, which is then fed into computer trajectory models to produce a predicted pattern of oil movement.

To increase spill preparedness and streamline the OSPR program, the On-Line Vessel database was created to enable vessel operators to register response and preparedness information electronically, rather than submit hard copy plans.

The Texas Oil Spill Planning and Response Toolkit, produced by the OSPR program, with assistance from the Coast Guard, is the most comprehensive oil spill preparedness tool available. The toolkits are comprised of sensitivity maps, local knowledge guides, forms, and Area Contingency Plans for all of Texas. The program publishes the toolkit as both a downloadable program and CD-ROM. The toolkit is updated annually and is widely distributed free of charge throughout the Gulf Coast.

Local Government Wetlands Plan

The Local Government Wetlands Plan is a demonstration project that will incorporate the tools contained in Texas Coastal Wetlands: A Handbook for Local Governments. The GLO will form a partnership with a local government to

develop a local wetlands plan.

The Texas Coastal Management Program

The Texas CMP was created to coordinate state, local, and federal programs for the management of Texas coastal resources. The program brings in federal CZMA funds to state and local entities to implement projects and program activities for a wide variety of purposes.

Coastal Nonpoint Source Program

The Texas CMP was created to improve the management of the state's coastal resources to ensure the long-term ecological and economic productivity of the coast. The GLO administers the CMP and the Texas Coastal NPS Program. On April 7, 2003, the NOAA recommended conditional approval of the Texas Coastal NPS Pollution Control Program. The document discusses the coastal NPS management area; an overview of program implementation and coordination; presentation of specific NPS categories, the §6217 management measures, and the state rules and programs which address pollution sources and meet the federal requirements; information on additional management measures, technical assistance, and public participation; and program monitoring and evaluation.

Texas Beach Watch Program

In October 2000, the U.S. Congress passed the Beaches Environmental Assessment and Coastal Health Act of 2000 (BEACH Act) to protect the public health at our nation's beaches. The BEACH Act requires that states, in cooperation with the EPA, develop and implement a program to monitor coastal recreation waters adjacent to beaches that are used by the public, and to notify the public if water quality standards for pathogens and pathogen indicators are exceeded.

The BEACH Act requires the state to identify all factors used to evaluate and rank beaches; identify coastal recreation waters in the state; identify bathing beaches adjacent to coastal recreational waters; develop a sampling, monitoring, and notification program; develop a method for issuing beach advisories and/or closings; and develop a method to notify the public. In July 2001, the Governor's office appointed the GLO as the lead state agency to implement the BEACH Act based upon the current Beach Watch Program.

The Texas Beach Watch Program gives Texans baseline data on the health of gulf waters, making sure that beaches are safe for swimmers, surfers, sailors, and boaters. The Beach Watch Program involves county and city governments, universities, and organizations representing beach goers. Contractors test specified sites for Enterococcus bacteria and issue public advisories if water

samples exceed the criteria recommended by the EPA. Additionally, data collected through the Texas Beach Watch Program is used by TCEQ in developing the IR.

Coastal Texas 2020

Coastal Texas 2020 is a long-term, statewide initiative to unite local, state, and federal efforts to promote the environmental and economic health of the Texas coast. One goal of Coastal Texas 2020 is to increase the state's share of federal funding to fight rapid coastal erosion. Coastal Texas 2020 is designed to implement the vision of a comprehensive approach to coastal issues that mixes local, state, and federal funds with money from the private sector, while combining regulatory changes with market-based solutions.

The Adopt-A-Beach Program

The Texas Adopt-A-Beach Program, sponsored by the GLO, is dedicated to preserving and protecting Texas beaches by raising public awareness; educating citizens about the source of debris; and generating public support for state, national, and international action to clean up coastal waters. Since the first Adopt-A-Beach Cleanup in 1986, more than 300,000 volunteers have come to the Texas coast to haul off tons of trash. At each cleanup site, volunteers record data about the trash to learn more about the cause of marine debris. This data has been instrumental in the passage of international treaties and laws aimed at reducing the amount of offshore dumping. The program's success is due to the generous efforts of dedicated volunteer county coordinators, coastal community leaders, sponsors, and citizens. Strong support from the private sector helps carry the anti-litter message to Texans all across the state.

Small Spill Prevention Program

The GLO's small spill prevention program works with marinas and other interested parties to educate the public on ways to properly dispose of oil and reduce small spills. Small amounts of petroleum products may not kill fish and other marine organisms, but they can affect the vision, sense of smell, growth, and reproductive ability of marine wildlife. While small petroleum spills may impact marine wildlife, multiple small spills have the potential to impact entire water bodies. The Small Spill Prevention Program is an effective way to educate the public about ways to reduce spills and protect our marine resources.

Railroad Commission of Texas

The RRC is the state agency with primary regulatory jurisdiction over the exploration and production activities of the oil and natural gas industry, pipeline transporters, natural gas utilities, and surface mining operations. The main functions of the RRC are to protect the environment, protect public safety,

protect the correlative rights of mineral interest owners, prevent waste of natural resources, and assure fair and equitable utility rates in those industries over which it has been granted authority.

In addition, the RRC has a Voluntary Cleanup Program, which oversees the remediation of oil and gas related pollution and provides an incentive to remediate the pollution through a release of liability to the state in exchange for a successful cleanup. Applicants to the program may not have caused or contributed to the pollution. The RRC's brownfields program provides technical and financial support for redevelopment with little or no cost to local governments, non-profit organization, tribes, universities, school districts, and economic development corporations through a brownfields grant from EPA. The goals of the RRC's brownfields program are to provide grant-funded phase I and II environmental site assessments for targeted brownfields sites, provide free cleanup on qualified sites, and to coordinate the approach to site assessment, cleanup and redevelopment through the RRC's Voluntary Cleanup Program.

The RRC is responsible for plugging and cleanup of abandoned wells and sites. The RRC oversees cleanup by responsible parties of pollution associated with oil and gas activities under RRC jurisdiction. Funding for the RRC's program comes from regulatory fees, permit fees, and bond fees paid by the oil and gas industry. Cleanup and prioritization of sites is based on protection of public health, public safety, and the environment.

Oil and Gas Waste Management

The RRC regulates activities and the wastes generated as a result of activities associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline. These wastes are termed "oil and gas wastes," and include both hazardous and non-hazardous oil and gas wastes.

The RRC has responsibility for the prevention of pollution that might result from activities associated with exploration, development, and production of oil, gas, or geothermal resources of the state to prevent operations dangerous to life or property. The RRC uses rule-authorization and permitting to regulate the storage, transport, processing, and disposal of oil and gas wastes in Texas to prevent releases to the environment. RRC rules require that oil and gas wastes be processed and disposed of only in an authorized or permitted manner RRC's environmental and safety programs cover drilling, operation, and plugging of wells; separation and treatment of produced fluids in the field or at natural gas processing plants; storage of crude oil before it enters the refinery; underground storage of hydrocarbons in salt caverns or natural gas depleted reservoirs; transportation of crude oil or natural gas by pipeline; drilling, operation and plugging of brine wells; and storage, hauling, reclamation, or disposal of wastes generated by these activities.

The RRC's environmental and safety regulations for oil and gas wastes are administered through the agency's Technical Permitting, Site Remediation, and Field Operations programs. The Technical Permitting program oversees the management and disposal of oil and gas waste, at surface and near surface, and is responsible for regulating the construction, operation, permitting and closure of injection wells that place fluids underground for storage and disposal. The Technical Permitting program also coordinates with other state and federal agencies on environmental and safety matters. The Field Operations program coordinates the activities of nine district offices in inspecting oil and gas operations and enforcing the RRC's environmental and safety rules. The Field Operations and the Site Remediation programs handle the Oil and Gas Regulation and Cleanup (OGRC) Fund. The OGRC is supported by the agency's existing fees. The Site Remediation program also reviews operator cleanup activities and coordinates the RRC's response to large spills and other major events.

The RRC regulates discharges of waste from activities associated with the exploration, development, or production of oil, gas, or geothermal resources, including transportation of crude oil and natural gas by pipeline, and from solution brine mining activities (except solution mining activities conducted for the purpose of creating caverns in naturally-occurring salt formations for the storage of wastes regulated by the TCEQ). Discharges of waste regulated by the RRC into water in the state cannot cause a violation of the water quality standards. While water quality standards are established by the TCEQ, the RRC has the responsibility for enforcing any violations of such standards. In addition, the NPDES authority delegated to Texas by EPA does not include those discharges from activities under the RRC's jurisdiction; such a discharger must obtain authorization from both the RRC and the EPA.

Oil and Gas Waste Minimization Program

The Oil and Gas Waste Minimization Program, administered by the RRC, offers assistance to oil and gas operators interested in minimizing wastes through source reduction and recycling of oil and gas wastes. The RRC's program includes several products and services, including a manual, workshops, technology transfer, waste minimization planning software, a newsletter, and on-site assistance.

The RRC establishes oil and gas well construction and plugging standards. The RRC Groundwater Advisory Unit establishes the location of the base of usable quality groundwater. Wells must be constructed and plugged in such a manner that the usable quality groundwater is protected from contaminants that may migrate during the life of the well. In addition, RRC authorizations by rule and permits for storage, management and disposal of oil and gas waste, include requirements for pit liners, sampling and monitoring, and runoff control.

Oil and Gas Well Plugging Program

The RRC has long been active in regulating the exploration, development, and production of oil and gas in Texas, which includes protecting the environment and maintaining public safety. The RRC began regulating oil and gas exploration and production operations in 1919 and over time has adopted increasingly stringent plugging standards and procedures. Statutes to prevent pollution from unplugged wells have also been modified over the years to increase RRC authority in this area.

The RRC has utilized the OGRC to plug over 32,000 wells; however, thousands of additional abandoned wells remain. To ensure effective and efficient use of the OFCU Fund, the RRC has implemented a well plugging priority system to plug the wells that pose the greatest risk to the environment. The OFCU Fund is supported entirely by existing agency fees. The RRC has worked with the TCEQ to utilize CWA §319(h) grant funding to reduce chloride and TDS in several watersheds.

Texas Department of Transportation

The Texas Department of Transportation (TxDOT) is the lead state agency for construction and maintenance of state roads, which includes responsibility for the management of potential pollution from road and highway operations. TxDOT has a comprehensive state-wide storm water management effort to ensure water quality throughout the state.

TxDOT maintains compliance with a number of TPDES programs on a statewide and district level. These programs, including Phase I and II MS4 permits as well as TPDES Construction Permits, identify TxDOT as a pollutant point source. TxDOT's non-permitted areas are controlled by stringent work practices, programs, and policies also implemented on a state-wide and district level, as described below.

Litter Pick Up

TxDOT hires private contractors to walk along the ROW and pick up litter for disposal. These comprehensive activities minimize the amount of floatable materials which may block storm drain systems and discharge pollutants to surface water. Each roadway segment in the urban area is treated multiple times a year. Mobile, stop-and-go spot litter pickup operations are also performed on an as-needed basis to collect litter between comprehensive litter pickup events Picnic and safety rest areas are also treated on a routine basis.

Street Sweeping

TxDOT hires private contractors to perform street sweeping on TxDOT roadways throughout the permit area. Most of the street sweeping is vacuum-assisted

which provides the greatest level of particulate recovery. Roadways with an urban profile are generally treated at least once per month. Elevated section treatments include as-needed vacuuming of inlets, sediment pans and drain pipes, and expansion joints between bridge deck sections.

Permeable Friction Course

The use of permeable friction course (PFC) by TxDOT is a BMP that aides in pollutant removal. PFC is a layer of porous asphalt up to two inches thick overlaid on existing conventional concrete or asphalt surface. Storm water that falls on the friction course drains through the porous layer to the original impervious road surface at which point the water drains along the boundary between the pavement types until the runoff emerges at the edge of the pavement. Historically, the main use of PFC in Texas has been to increase safety through improved visibility and better traction. However, when used on high speed roadways with no curbs, research has documented TSS removal of 90% compared with conventional concrete or asphalt pavements. The use of this pavement is categorized as a BMP within the Edwards Aquifer Program because of its capability to remove TSS in this sensitive aquifer region.

Structural Controls - Construction and Post Construction

TxDOT designs storm water structural controls in a manner to reduce the discharge of pollutants to the Maximum Extent Practicable. TxDOT's manual entitled *Storm Water Management Guidelines for Construction Activities* provides guidelines to prevent erosion and pollutants from projects from flowing into the waters of the United States. The manual provides guidelines for each structural control device, including height, width, depth, and drainage area design requirements for each device. In addition to the construction guidelines manual, TxDOT maintains stringent design specifications, ensuring structural goals meet water quality requirements.

TxDOT's policy is to implement activity-appropriate BMPs for any soil disturbing activity where a potential for storm water discharges exists, regardless of the type of activity or acreage disturbed.

Public Education and Participation

TxDOT has developed a multifaceted, comprehensive program designed to ensure public participation in storm water management throughout the state. These programs target the public, including TxDOT employees, to understand and implement practices to improve water quality. Elements of TxDOT's statewide public education and outreach program include training, public education campaigns, research projects, along with other efforts. TxDOT programs such as "Don't Mess with Texas" and Adopt-a-Highway programs are included in these efforts and are successful contributors to litter abatement.

The Adopt-a-Highway program is implemented statewide to teach Texans about litter prevention by allowing citizens to pick up litter along Texas highways. The program encourages litter pick-up by establishing sections of the highway to be adopted by individuals or groups for clean-up. Upon adopting a section of the highway, a sign will be posted along the highway naming the individual or group who has adopted the section of the highway. The program concept has been adopted by 47 other states and several foreign countries.

Pesticide, Herbicide, and Fertilizer Application

TxDOT implements controls to reduce the discharge of pollutants related to storage by minimizing the quantities of pesticides, herbicides, and fertilizers, applied by TxDOT's employees or contractors, to public ROW, parks, or other TxDOT property. TxDOT has created the *Roadside Vegetation Management Manual*, which includes vegetation management guidelines, as well as other vegetation management considerations and recommended practices.

Texas Department of State Health Services

The Texas DSHS is the lead agency to protect, promote, and improve the health of the people of Texas. DSHS administers several programs that support public health and environmental programs. The Environmental Sciences Branch provides analytical chemistry laboratory support to the EPA Safe Drinking Water Program. The Division for Regulatory Services-Seafood and Aquatic Life Group protects consumers of fish and shellfish from disease or other health hazards transmissible by these products produced in or imported into Texas. The Seafood and Aquatic Life Group also protects the recreational fishers from disease or contaminants found in fish and other aquatic species caught in Texas' lakes, rivers, bays, or near shore state waters. Consumption advisories, possession bans, and shellfish harvesting areas restrictions issued by TDSHS are evaluated by TCEQ when developing the IR.

Colonias Initiatives Program

The Colonias Initiatives Program is administered by the Texas Secretary of state's Office. One of the greatest concerns regarding the colonias is the lack of wastewater infrastructure, potable water, and the potentially serious consequences for public health and its effect on quality of life. The Colonia Incentives Program was initiated to advance efforts to get colonia residents' homes connected to water and wastewater services in a more expeditious manner.

River Systems Institute

The River Systems Institute, located at Texas State University-San Marcos, supports research, education, stewardship, and service programs that ensure sustainable water resources for human needs, ecosystem health, and economic development. The Institute develops and promotes holistic approaches to the management of river systems, with those systems including the springs, streams, groundwater aquifers, and the watersheds that feed them, as well as the lakes, bays, and estuaries into which they flow.

This broad approach supports the Management Program goals of data collection and assessment, implementation, and education. The Institute is uniquely positioned in working toward these goals that reduce NPS pollution and preserve a watershed's natural ability to sustain clean and abundant water supplies. The Institute continues to apply cutting edge technologies specifically aimed at systematic watershed characterization that inform and refine water quality and quantity management strategies, continues to support it's transboundary and binational watershed work, and continues its work within the San Marcos watershed and in particular the Spring Lake area where the Institute is located, to achieve its goal to develop this area into a nationally recognized watershed educational and research center.

Data Collection and Assessment

The Institute's monitoring programs support watershed research, management, and policy decisions and are conducted in collaboration with institutional partners, water resource professionals, faculty and students, and volunteers. These monitoring programs fill information gaps that have historically impeded critical components of watershed management such as assessment and modeling. The Institute is developing and implementing an observing system for Spring Lake and the Upper San Marcos River that will collect, compile, and maintain high resolution physical, chemical, and ecological data using state of the art technologies. One component of these efforts will be the testing and assessment of sampling and analysis methodologies that can be rapidly deployed throughout the state and may be incorporated into WPPs, TMDLs, and other specialized projects seeking to refine their management strategies and optimize how funding is targeted.

The Institute also supports real-time, fixed station, ambient, and storm water monitoring programs that produce physical and chemical data including key NPS variables such as bacteria and nutrients. Texas Stream Team, which is part of the Institute, certifies volunteers to gather dissolved oxygen, pH, conductivity, temperature, turbidity, and bacteria data that are used to isolate suspected pollution sources, target locations for professional monitoring, assess BMP effectiveness, and fill gaps in baseline water quality data sets.

Assessment and Characterization

The Institute recognizes that effective watershed management establishes linkages between land use and the integrity of ecosystem processes and services. It supports water resource managers in establishing these linkages in several ways by:

- assessing the prevalence and severity of pollutant loadings;
- relating fluvial biodiversity with watershed function;
- collecting temporal and predictive data on urban growth and historical land use patterns to be used as inputs for hydrologic and water quality impact simulation models; and
- addressing gaps in our understanding of the relationships between key lotic ecological dynamics, ecosystem processes, and watershed land-use patterns.

The Institute develops and deploys assessment and prioritization tools, such as decision support systems that incorporate hydrologic and land use models that support management priorities and facilitate stakeholder participation in planning and implementation. These modeling efforts incorporate affects of land use change, stream flow, water quality, and nonpoint source pollution and provide temporal and predictive information on urban growth or historical land use patterns. These modeling efforts also support a wide range of assessment and management tasks such as helping stakeholders identify natural areas that have high water quality value that should be targeted for protection. The combined efforts lay the groundwork for improved watershed management including work with local governments to improve existing ordinances or practices.

Watershed Planning and Implementation

The Institute helps communities develop WPPs and large scale regional planning frameworks that support sustainable use of the region's water resources. The intended outcomes of these plans include maintenance of water quality standards, alignment of water availability with demand, agricultural irrigation efficiency, improved watershed hydrologic function, sustainable growth, and incorporation of natural areas into water quality management strategies.

Watershed plans are implemented in collaboration with stakeholders as well as directly through the Institute. The implementation strategies are far-ranging and have included:

- exotic aquatic plant composting using various feed stocks, including poultry litter removed from watersheds designated as impaired on the federal §303(d) list; and
- restoration of Spring Lake's natural features in order to reduce NPS impacts to the Lake and to enhance the site's uniqueness as a research and educational facility.

Education and Outreach

The Institute actively engages stakeholders through education and outreach programs which support discrete, customized programs and curricula for all ages: from pre-school, through high school, college, professional, and post-retirement. These programs emphasize awareness about behaviors that cause NPS pollution and the stewardship practices that reduce it. They include information about water resources and focus on the unique conditions and management practices called for in the stakeholder's "home" watershed. The Institute assesses the effectiveness of these programs by measuring changes in knowledge, attitudes and behavior through surveys and by incorporating environmental literacy rubrics that help link knowledge and behavior changes to water quality improvement.

Texas Stream Team

The Texas Stream Team serves as a valuable resource for educating the public about water quality issues and fostering citizen participation in monitoring and protecting water quality. The Texas Stream Team is administered through a cooperative partnership between Texas State University, the TCEQ, and the EPA. The Texas Stream Team supports NPS and other environmental education and volunteer monitoring activities throughout the state. The Texas Stream Team, through its varied outreach activities, encourages individuals to adopt activities and behaviors which contribute to the improvement of water quality and prevention of NPS pollution.

Keep Texas Beautiful

The vision of the Keep Texas Beautiful (KTB) organization was designed to make Texas the most beautiful state in the nation. KTB seeks to achieve this goal through partnerships involving government, business, civic groups, and volunteers to address litter prevention, solid waste management, recycling, composting, beautification, and general community improvement. KTB programs empower Texans through education to take responsibility for enhancing their community's environment.

Any Texas community can become a KTB Affiliate. Affiliates receive a variety of services to improve their effectiveness in mobilizing grassroots volunteers to beautify their communities. KTB has established an annual certification and recognition program for communities with ongoing programs for litter prevention, beautification, community improvement, and the minimization of solid waste.

KTB sponsors and coordinates many of its education and cleanup programs in cooperation with state agencies including TxDOT and the TCEQ. KTB is currently under contract with the TCEQ to operate the River and Lakes Cleanup Program. Each year, KTB helps sponsor dozens of cleanups across the state in partnership

with local governments, concerned citizens, community and nonprofit groups, schools, scout troops, businesses and companies. Volunteers pick up litter and debris along the shores and banks of Texas lakes and rivers. In return, participants receive, free of charge: trash bags, posters, T-shirts, press releases, and volunteer incentives.

KTB has also taken a leadership role on the issue of illegal dumping and litter law reinforcement by offering seminars and conferences, and forming a statewide task force to share information, discuss the issue, and develop solutions.

Clean Marina Initiative

The Clean Marina Initiative is a voluntary, incentive-based program promoted by the NOAA and others that encourages marina operators and recreational boaters to protect coastal water quality by engaging in environmentally sound operating and maintenance procedures. NOAA is jointly responsible for administering the Coastal Nonpoint Control Program with EPA, and plays an important role in protecting coastal waters from polluted runoff. The Coastal Nonpoint Program establishes a consistent set of management measures for all coastal states to use in controlling NPS pollution. Management measures are designed to prevent or reduce runoff from a variety of sources, including marinas. NOAA recognizes that the Clean Marina Initiative can serve a valuable role in protecting coastal waters from NPS pollution and has promoted the program as a way for states to meet many of the marina management measure requirements under the Coastal Nonpoint Program. As a result, the Coastal Nonpoint Program has been responsible for driving the development of most of the state Clean Marina Programs existing today and developing a national interest in the initiative. NOAA continues to support the Clean Marina Initiative through targeted grant funding to states developing Clean Marina Programs.

Clean Texas Marina Program

The Clean Texas Marina Program is a partnership among the Marina Association of Texas, Texas Sea Grant College Program, TCEQ, and TPWD. This program enables marinas to be recognized for their efforts in environmental responsibility. It also lets boaters identify those marinas that promote clean activities and follow BMPs. Participation is voluntary and shows a marina's commitment to keeping Texas boating areas safe and clean.

The Clean Texas Marina Program recognizes operators of public and private marinas who voluntarily meet high standards that help keep Texas waterways clean. To be certified as a Clean Texas Marina, the operator must submit a pledge form, complete a self-assessment using a checklist, be sure the marina is complying with all applicable laws and regulations, and when ready, schedule an on-site confirmation visit with the Texas Sea Grant College Program.

Clean Texas Boater Program

As part of the Clean Texas Marina Program, the Clean Texas Boater Program recognizes individual boaters who pledge to help keep Texas waterways clean by working with certified Clean Marinas. The Clean Texas Boater Program is an important part of the Clean Texas Marina Program, which is designed to assist marina, boat yard, and yacht club operators in protecting the resources that provide their livelihood: clean water and fresh air. By adopting pollution prevention measures, boaters receive a Clean Texas Boater sticker to display on their vessels and can take satisfaction in knowing they are doing their part by keeping Texas waterways and shores clean, preserving our waterways for the future, and learning and teaching clean boating habits.

To be certified as a Clean Texas Boater, the boater must read the Clean Boating Tips card, agree to follow the tips by signing the pledge card, mail the pledge card to the Clean Texas Boater Program office, and display the Clean Texas Boater sticker on their vessel.

Texas Invasive Species Coordinating Committee

The Texas Invasive Species Coordinating Committee (TISCC) was established by the 81st Texas Legislature in 2009. Statutorily-authorized members of the TISCC include TDA, TPWD, TSSWCB, the Texas AgriLife Extension Service, the TFS, and TWDB. On the request of a state agency that has an interest in controlling invasive species, the aforementioned member agencies by unanimous agreement may add the requesting agency to the TISCC. The TISCC is administratively attached to the TSSWCB whose staff serves as committee coordinator.

The TISCC serves as a catalyst for cooperation between state agencies on invasive species control. The TISCC provides a forum for developing effective and timely interagency strategies and policies for invasive species control. The TISCC facilitates governmental efforts, including efforts of local governments and special districts, to manage and prevent the spread of invasive species. The TISCC makes recommendations to the leadership of state agencies regarding research, technology transfer, and management actions related to invasive species control.

A myriad of invasive plant and animal species, both aquatic and terrestrial, plague the water resources of Texas. Water quality is impaired, water quantity is diminished, and aquatic ecosystems are affected. For example:

- rapidly expanding infestations of giant salvinia can overgrow and replace native aquatic plants, creating dense surface cover preventing light and oxygen from entering the water. Additionally, decomposing material from mats of giant salvinia drops to the bottom of lakes and ponds, greatly consuming dissolved oxygen needed by fish and other aquatic life;
- feral hogs are significant contributors of pollutants to creeks and rivers across the state. As feral hogs congregate around water sources to drink and wallow, this concentration of high numbers in small riparian areas

poses a threat to water quality. Fecal matter deposited directly in streams by feral hogs contributes bacteria and nutrients. In addition, extensive rooting activities of groups of feral hogs can cause extreme erosion and soil loss; and

- riparian areas infested by saltcedar impact salinity levels in water bodies. Water quality concerns arise from saltcedar's ability to effectively transport salt from the soil profile or water table to the surface where it remains until it leaches back into the soil or is transported downstream during high flows. Saltcedar can also intensify water quality problems due to its ability to reduce groundwater supplies and streamflow through evapotranspiration.

The TISCC works to prevent, monitor, and control or eradicate invasive species and to reduce environmental, economic, and human health threats from invasive species. Efforts of the TISCC contribute to the implementation of the National Invasive Species Management Plan developed under the auspices of Executive Order 13112. Work by the TISCC supports the state's water quality goals and contributes to achieving the goals and objectives of this Management Program.

Regional and Local Agencies

The following sections describe the various regional and local agencies and the programs they administer which contribute to managing NPS pollution in Texas.

Cities

Cities in Texas have numerous environmental responsibilities including water and wastewater services, solid waste management, and storm water management. Cities in Texas have many programs to address storm water pollution including educational materials, inspections, and land development guidelines.

Counties

Counties in Texas have numerous environmental responsibilities including OSSF management, solid waste management, and storm water management. OSSF management programs are implemented in accordance with rules established by TCEQ which include site plan approval, construction inspection, and complaint response.

River Authorities

River Authorities are created by the Texas Legislature as water conservation and reclamation districts. River Authorities provide stewardship for the water resources in their basins. Planning and resource development efforts are carefully coordinated within the broader consideration of regional and statewide water

needs in order to fulfill responsibilities of developing, conserving and protecting the water resources. Many river authorities are CRP partners.

Councils of Governments

Councils of governments are voluntary associations of local governments formed under Texas law. These associations deal with the problems and planning needs that cross the boundaries of individual local governments or that require regional attention. Regional services offered by councils of governments are varied. Services are undertaken in cooperation with member governments, the private sector, and state and federal partners, and include promoting regional municipal solid waste and environmental quality planning. In addition, Texas' regional councils of governments are responsible for regional planning activities that may differ from region to region, but typically include planning for economic growth, water supply and water quality, air quality, transportation, emergency preparedness, and the coordinated delivery of various social services. Many councils of governments establish and host region-wide geographical information systems as well as databases on regional population, economic, and land-use patterns.

Soil and Water Conservation Districts

Soil and Water Conservation Districts are independent political subdivisions of state government, like a county or school district. The first SWCDs in Texas were organized in 1940 in response to the widespread agricultural and ecological devastation of the Dust Bowl of the 1930s. There are currently 216 SWCDs organized across the state. Each SWCD is governed by five directors elected by landowners within the district.

As illustrated in Figure 5.1, SWCDs serve as the state's primary delivery system through which technical assistance and financial incentives for natural resource conservation programs are channeled to agricultural producers and rural landowners. SWCDs work to bring about the widespread understanding of the needs of soil and water conservation. SWCDs work to combat soil and water erosion and enhance water quality and quantity across the state by giving farmers and ranchers the opportunity to solve local conservation challenges. SWCDs instill in landowners and citizens a stewardship ethic and individual responsibility for soil and water conservation.

> "The soil conservation district is the (mechanism) through which those who love the land pool their efforts and information in making land more stable and productive and our country more prosperous and a better land in which to live. The fact that landowners themselves have the responsibility for voting in a district, formulating its program, administering its business and entering into cooperative agreements with their fellow landowners, makes soil conservation districts a democracy in

action."

V.C. Marshall, Father of the Texas SWCD Program

Many of the TSSWCB's statewide programs, such as the WQMP Program, Water Supply Enhancement Program, and Flood Control Program, are administratively coordinated through the efforts of local SWCDs. Additionally, SWCDs assist federal agencies in establishing resource conservation priorities for federal Farm Bill and CWA programs based on locally-specific knowledge of natural resource concerns. SWCDs work with the USDA NRCS, USDA Farm Service Agency, USEPA, Texas AgriLife Extension Service, TFS, and others when necessary to assist landowners and agricultural producers meet natural resource conservation needs. SWCDs are actively involved in promoting outreach and education programs such as, sponsoring pesticide applicator workshops, agricultural producer field days, land and range judging contests for students, scholarships, and securing funds for the construction of outdoor classrooms. SWCDs have organized themselves into a tax-exempt, non-profit organization, the Association of Texas Soil and Water Conservation Districts.

SWCDs in Texas do not have taxing authority; therefore, various federal and state agencies and other local governmental entities provide assistance to SWCDs. As TSSWCB is charged with the responsibility of coordinating the programs and activities of the state's 216 local SWCDs, the assistance programs provided by TSSWCB make up the majority of SWCDs' operating budgets. Additionally, many SWCDs have received CWA §319(h) NPS grants from TSSWCB to implement specific objectives in WPPs and TMDLs. The delivery system that SWCDs present for the state is one of the most efficient and effective mechanisms for conducting natural resource conservation programs.

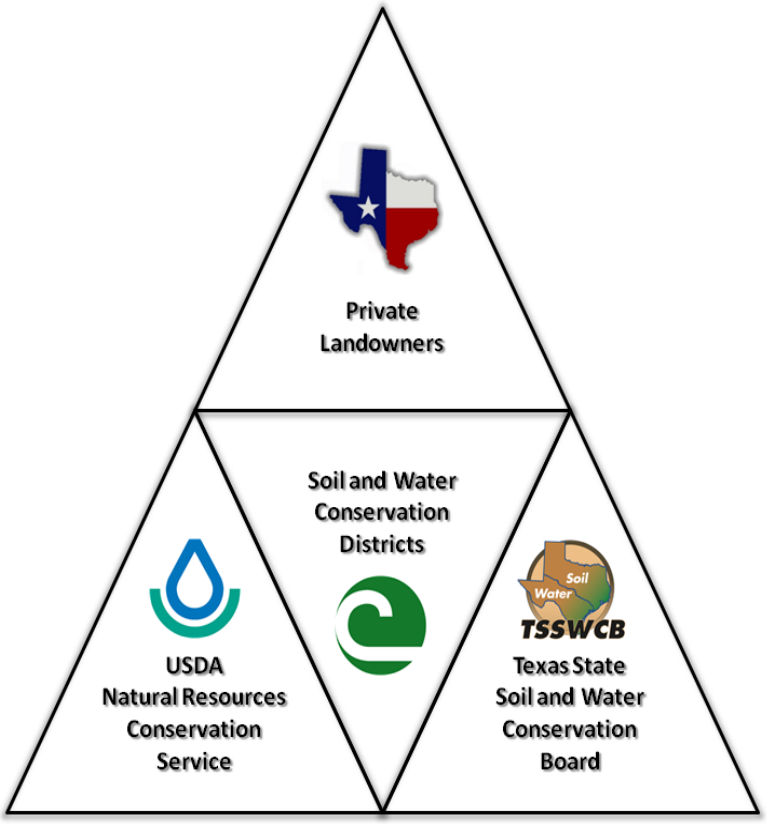

Figure 5.1 Texas Conservation Partnership

Groundwater Conservation Districts

The legislature has stressed the importance and responsibility of Groundwater Conservation Districts in developing and implementing comprehensive management plans to conserve and protect groundwater resources. Wastewater reuse, desalination, well spacing regulations, brush control, drought contingency with water conservation, and other strategies are featured in the plans. While water quantity is the focus of these plans, water quality may also be addressed, and GCDs are encouraged by their enabling legislation to coordinate groundwater quality assessment and protection activities with the appropriate state regulatory agencies.

Texas Alliance of Groundwater Districts

The Texas Alliance of Groundwater Districts (TAGD) is the umbrella organization composed of groundwater conservation districts within the state. Its membership is restricted to groundwater conservation districts which have the powers and duties to manage groundwater as defined in TWC, Chapter 36.

The Alliance was formed to further the purposes of groundwater conservation and protection activities. NPS pollution can impact water quality of groundwater resources. Therefore, TAGD has an active interest in the Management Program.

The Alliance provides a means of communication and exchange of information between individual groundwater conservation districts on issues ranging from the day-to-day operation of local groundwater management to statewide groundwater resource policy issues. Members of TAGD are part of a network in which valuable technical and operational experience is available to Alliance members and the interested public. TAGD members also serve on various local, state, and federal agency committees and subcommittees and maintain contact with members of the private sector and various elected officials.

Federal Agencies

The following sections describe the various federal agencies and the programs they administer which contribute to managing NPS pollution in Texas.

United States Environmental Protection Agency

EPA works to develop and enforce regulations that implement environmental laws enacted by Congress. EPA is responsible for researching and setting national standards for a variety of environmental programs, and delegates to states and tribes the responsibility for issuing permits and for monitoring and enforcing compliance. While EPA protects the nation's natural resources primarily through regulation, EPA has also developed a wide variety of funding, planning, and education programs that are effective in protecting environmental quality.

Watershed Planning and the CWA §319 Program

EPA offers numerous free tools and resources that simplify the watershed planning process and provide access to needed resources, including:

- Handbook for Developing Watershed Plans to Restore and Protect Our Waters. This guidance document discusses the watershed management process. (*www.epa.gov/nps/watershed_handbook*);
- Watershed Plan Builder. This online tool generates a customized outline that will help develop a watershed management plan. (*http://java.epa.gov/wsplanner*);
- Watershed Central and Watershed Central Wiki. This online information sharing and networking resource provides watershed management information and connections with knowledgeable professionals. (*www.epa.gov/watershedcentral*);
- Training. EPA offers free online seminars and courses about watershed protection and planning. (*www.epa.gov/watershedacademy*); and
- Funding. EPA offers a series of tools, documents, databases and other tools to help identify potential funding sources. *(*www.epa.gov/owow/funding.html*)*.

Water Quality Standards

Water Quality Standards are the foundation of the water quality-based pollution control program mandated by the CWA. Water Quality Standards define the

goals for a water body by designating its uses, setting criteria to protect those uses, and establishing provisions such as antidegradation policies to protect water bodies from pollutants. More information about EPA's Water Quality Standards program, as well as the EPA-approved standards for each state and territory can be found at:
http://water.epa.gov/scitech/swguidance/standards/.

Monitoring and Assessment

The nation's waters are monitored by state, federal, and local agencies, universities, dischargers, and volunteers. Water quality data are used to characterize waters, identify trends over time, identify emerging problems, determine whether pollution control programs are working, help direct pollution control efforts to where they are most needed, and respond to emergencies such as floods and spills. Reports and additional information on EPA's Monitoring and Assessment program can be found at:
http://water.epa.gov/type/watersheds/monitoring/monitoring_index.cfm.

Drinking Water

The Office of Ground Water and Drinking Water (OGWDW), together with states, tribes, and its many partners, protects public health by ensuring safe drinking water and protecting groundwater. OGWDW, along with EPA's ten regional drinking water programs, oversees implementation of the Safe Drinking Water Act, which is the national law safeguarding tap water in America. Additional information is located at: *http://water.epa.gov/drink/index.cfm*.

Groundwater

Many communities obtain their drinking water from aquifers. Water suppliers drill wells through soil and rock into aquifers to reach the ground and supply the public with drinking water. Many homes also have their own private wells drilled on their property to tap this supply. Unfortunately, the groundwater can become contaminated by human activity. These chemicals can enter the soil and rock, polluting the aquifer and eventually the well. Information on the Office of Ground Water activities to protect groundwater can be found at:
http://water.epa.gov/type/groundwater/index.cfm.

Wastewater Permitting

Water pollution degrades surface waters making them unsafe for drinking, fishing, swimming, and other activities. As authorized by the CWA, the NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters. Other discharges such as municipal storm water, CAFOs are permitted under EPA's NPDES program. More information on the program can be found at:

http://cfpub.epa.gov/npdes/index.cfm.

Wetlands

EPA has a number of programs for wetland conservation, restoration, and monitoring. EPA, along with the U.S. Army Corps of Engineers (Corps), establishes environmental standards for reviewing permits for discharges that affect wetlands, such as residential development, roads, and levees. Under CWA, §404, the Corps issues permits that meet environmental standards (after allowing the public to comment). More information on EPA's wetland program and activities is located at: *http://water.epa.gov/type/wetlands/index.cfm*.

United States Geological Survey

The USGS has the principal responsibility within the Federal Government to provide the hydrologic information and understanding needed by others to achieve the best use and management of the Nation's water resources. Through the National Water Quality Assessment Program (NAWQA), USGS scientists collect and interpret data about water chemistry, hydrology, land use, stream habitat, and aquatic life. The NAWQA Program is a primary source for long-term, nationwide information on the quality of streams, groundwater, and aquatic ecosystems. This information supports national, regional, state, and local decision making and policy formation for water-quality management. The goals of NAWQA are to assess the status and trends of national water quality and to understand the factors that affect it.

The USGS also conducts a large amount of monitoring statewide and much of the data are utilized by the TCEQ. The USGS surface water collection network in Texas is primarily established to monitor stream flow continuously at many permanent sites. Field measurements, routine water chemistry, and metals in water are also collected at many of the fixed sites. Sites are chosen to represent a mix of natural and human factors that influence water quality. Chemical variables are then related by the USGS to hydrologic conditions to interpret water-resource conditions and meet water quality management needs. Estimation of point and nonpoint source loadings, storm water management, and chemical-contaminant controls are some of those needs.

National Oceanic and Atmospheric Administration

The NOAA is a scientific agency within the United States Department of Commerce focused on the conditions of the oceans and the atmosphere. NOAA warns of dangerous weather, charts seas and skies, guides the use and protection of ocean and coastal resources, and conducts research to improve understanding and stewardship of the environment. Among many other responsibilities, NOAA administers the CZMA of 1972 which provides for management of the nation's coastal resources and balances economic development with environmental conservation.

The CZMA created the National Coastal Zone Management (CZM) Program, a voluntary partnership between NOAA and 34 coastal and Great Lakes states, territories and commonwealths. The partnership works to preserve, protect, develop, and where possible, restore and enhance the nation's coastal zone resources. The National CZM Program takes a comprehensive approach to coastal resource management-balancing the often competing and occasionally conflicting demands of coastal resource use, economic development, and conservation. Some of the key elements of the National CZM Program include: protecting natural resources; managing development in high hazard areas; giving development priority to coastal-dependent uses; providing public access for recreation; and coordinating state and federal actions.

The Coastal Nonpoint Pollution Control Program was established by Congress in 1990 under the CZARA, Section 6217 and is jointly administered by NOAA and EPA. The Coastal Nonpoint Program represents a comprehensive approach to polluted runoff, recognizing that all land-use activities in coastal watersheds can have impacts on estuaries, beaches, marine resources and the ocean. The program is fundamentally about improved coordination and pollution prevention, seeking to build partnerships and networks that facilitate the implementation of appropriate methods to limit polluted runoff before problems occur.

The Coastal Nonpoint Program builds upon existing state coastal zone management and water quality programs by applying a consistent set of economically achievable management measures to prevent and mitigate polluted runoff. These measures are designed to control runoff from six main sources: forestry, agriculture, urban areas, marinas, hydromodification, and loss of wetlands and riparian areas.

Gulf of Mexico Community-Based Restoration Program

The Gulf of Mexico Community-Based Restoration Program (GCRP) Partnership invites proposals for its citizen-driven habitat restoration projects. The partnership funds on-the-ground activities to restore marine, estuarine, and riparian habitats. This grant program seeks to restore and protect the health and productivity of the Gulf of Mexico in ways consistent with the economic well being of the region. Projects must be within the designated priority area, the Lower Laguna Madre, Texas Coastal Bend and Bays, and Galveston Bay.

The GCRP is a multi-year, regional partnership between the Gulf Ecological Management Sites (GEMS) Program and the NOAA Community-Based Restoration Program. The purpose of this partnership was designed to strengthen the conservation efforts of the GEMS Program by supporting on-the-ground habitat restoration benefitting living marine resources and fostering local stewardship of ecologically significant areas across the Gulf of Mexico.

United States Army Corps of Engineers

The U.S. Army Corps of Engineers is a worldwide organization that provides engineering services, environmental restoration, and construction support for a wide variety of civil and military projects. The Corps' primary civil mission is developing and managing the nation's water resources. The Corps develops projects to reduce flood damage; improves navigation channels and harbors; protects wetlands; and preserves, safeguards, and enhances the environment.

United States Coast Guard

The U.S. Coast Guard is a military, multi-mission, maritime service and one of the nation's five Armed Services. Its mission is to protect the public, the environment, and U.S. economic interests – in the nation's ports and waterways, along the coast, on international waters, or in any maritime region as required supporting national security. The Coast Guard addresses the wide ranging problems associated with preventing, responding to, and paying for pollution associated with oil spills and leaks. It does so by creating a comprehensive program that deals with prevention, response, liability, and compensation of spills from vessels and facilities in our navigable waters.

United States Department of Agriculture

USDA provides federal leadership on food, agriculture, natural resources, and related issues based on sound public policy, the best available science, and efficient management. USDA agencies described below include the Agricultural Research Service (ARS), the Farm Service Agency (FSA), the Forest Service, and the Natural Resources Conservation Service (NRCS)

Natural Resources Conservation Service

The NRCS is a federal agency that works hand-in-hand with the people of Texas to improve and protect soil, water, and other natural resources. For decades, private landowners have voluntarily worked with NRCS specialists to prevent erosion, improve water quality, and promote sustainable agriculture.

NRCS has a unique partnership with SWCDs. All 216 SWCDs in Texas have working mutual agreements with the USDA to provide grassroots input to USDA through NRCS.

Environmental Quality Incentives Program

Resources available to address issues related to nonpoint sources from privately owned agricultural land were significantly enhanced by the passage and implementation of the 2008 Federal Farm Bill. The Environmental Quality Incentives Program (EQIP) in the Conservation Title of the 2008 Farm Bill is a voluntary conservation program that promotes agricultural production and

environmental quality as compatible goals. Through EQIP, farmers and ranchers may receive financial and technical assistance to install or implement structural and management conservation practices on eligible agricultural land. EQIP is administered by the USDA-NRCS, but the priorities for allocation and distribution of funds are established with input from a State Technical Advisory Committee (STAC) that is composed of representatives from federal and state resource agencies and organizations that are associated with agriculture. The TSSWCB and TCEQ are represented on this committee. In Texas, financial assistance funds will be used to address both the local high priority practices identified by the Local Work Groups that are chaired by SWCDs and the statewide resource concerns identified by the STAC. The STAC and Local Work Groups recommend the practices eligible for cost share. Eligible persons may select to apply in the county-based program recommended by the Local Work Group or in one of the Statewide Resource Concerns recommended by the STAC. Landowners and operators will choose the practices and evaluation systems that best fit their needs.

The availability of EQIP, active participation in the STAC, Local Work Groups, and accommodation of recommendations from the STAC by the State Conservationist have provided opportunities to focus resources on problem areas that were previously difficult or impossible to address. The voluntary nature of the program has enabled the STAC and the USDA-NRCS to establish state level resource concerns. By bringing this program down to the state level they are able to provide a portion of funds as incentive payments to producers that implement structural and management practices to address specific environmental problems. Through the STAC, the USDA-NRCS has actively pursued information on areas of the state where changes or adjustments in practices by individual land owners would be needed to contribute to the alleviation of identified environmental problems. This has enhanced the opportunities for regulatory agencies to use a combination of regulatory and voluntary practices to address specific problem areas impacted by nonpoint sources or a combination of point sources and nonpoint sources.

Watershed Program

The purpose of the Watershed Program, administered by the USDA-NRCS, is to assist state and local agencies, local units of government, and tribal governments (watershed sponsors) to protect and restore watersheds from damage caused by erosion, floodwater, and sediment; to conserve and develop water and land resources; and solve natural resource and related economic problems on a watershed basis. The program provides technical and financial assistance to project sponsors, builds partnerships, and requires local and/or state funding contribution.

Resource concerns addressed by the program include watershed protection; flood prevention; erosion and sediment control; water supply; water quality; opportunities for water conservation; wetland and water storage capacity;

agricultural drought problems; rural development; municipal and industrial water needs; upstream flood damages; water needs for fish, wildlife, and forest-based industries; fish and wildlife habitat enhancement; wetland creation and restoration; and public recreation in watersheds of 250,000 or fewer acres.

Plans or surveys including watershed plans, river basin surveys and studies, flood hazard analyses, and flood plain management assistance are developed to identify solutions that use conservation practice and nonstructural measures to solve resource problems. If approved, technical and financial assistance is provided for installation of improvement measures specified in the plans.

Conservation Technical Assistance Program

The Conservation Technical Assistance program, administered by the USDA-NRCS, provides voluntary conservation technical assistance to land-users, communities, units of state and local government, and other Federal agencies in planning and implementing conservation practices that address natural resource issues. The program encourages and assists citizens to voluntarily conserve, improve, and sustain natural resources.

Soil Survey Program

The National Cooperative Soil Survey (NCSS) is a partnership, led by NRCS, of Federal land management agencies, state agricultural experiment stations and state and local units of government that provide soil survey information necessary for understanding, managing, conserving and sustaining the nation's limited soil resources.

Soil surveys provide an orderly, on-the-ground, scientific inventory of soil resources that includes maps showing the locations and extent of soils, data about the physical and chemical properties of those soils, and information derived from that data about potentialities and problems of use on each kind of soil in sufficient detail to meet all reasonable needs for farmers, agricultural technicians, community planners, engineers, and scientists in planning and transferring the findings of research and experience to specific land areas. Soil surveys provide the basic information needed to manage soil sustainably. They also provide information needed to protect water quality, wetlands, and wildlife habitat. Soil surveys are the basis for predicting the behavior of a soil under alternative uses, its potential erosion hazard, potential for groundwater contamination, suitability, and productivity for cultivated crops, trees, and grasses. Soil surveys are important to planners, engineers, zoning commissions, tax commissioners, homeowners, developers, as well as agricultural producers. Soil surveys also provide a basis to help predict the effect of global climate change on worldwide agricultural production and other land-dependent processes.

Farm Service Agency

The principal mission of the Farm Service Agency (FSA) includes stabilizing farm income, helping farmers conserve land and water resources, providing credit to new or disadvantaged farmers and ranchers, and helping farm operations recover from the effects of disaster. Many of the FSA operated programs are funded through the Commodity Credit Corporation, a government owned and operated corporation established in 1933.

Conservation Reserve Program

The Conservation Reserve Program is a voluntary program administered by the FSA that offers annual rental payments, incentive payments, annual maintenance payments for certain activities, and cost-share assistance to establish approved cover on eligible cropland. The program encourages farmers to plant long-term resource-conserving cover to improve soil, water, and wildlife resources. These practices can reduce NPS pollution from agricultural lands. The Commodity Credit Corporation makes available cost-share assistance in an amount equal to not more than 50% of the participant's costs in establishing approved practices. Contract duration is between 10 and 15 years. The NRCS, National Institute of Food and Agriculture, state forestry agencies, and local SWCDs provide technical support for this program.

Agricultural Research Service

The Agricultural Research Service (ARS) is the principal in-house research agency of the USDA. ARS conducts research to develop and transfer solutions to agricultural problems of high national priority. Two of the twenty-two ARS National Programs, Water Quality and Management and Soil Resource Management, are strongly committed to applied NPS pollution research as part of their mission to increase understanding and develop solutions to protect the Nation's soil and water resources. In Texas, ARS is conducting ongoing research on NPS related issues such as: land application of municipal and agricultural wastes; improved management of soil, water, nutrients, and chemicals in agricultural production systems; and enhanced simulation tools for water quality, hydrology, and crop growth. ARS research, conducted by laboratories throughout the state, is often carried out in cooperation with universities, state research and extension centers, and private organizations.

Forest Service

Congress established the Forest Service in 1905 to provide quality water and timber for the Nation's benefit. Main activities include (1) protection and management of natural resources on National Forest System lands, (2) research on all aspects of forestry, rangeland management, and forest resource utilization (3) community assistance and cooperation with state and local governments, forest industries, and private landowners to help protect and manage Non-Federal forest and associated range and watershed lands to improve conditions in

rural areas. The Forest Service is also the largest forestry research organization in the world, and provides technical and financial assistance to state and private forestry agencies.

International Boundary and Water Commission, U.S. Section

The IBWC encourages and coordinates the establishment of cooperative relationships with federal, state, and local agencies, both in the U.S. and in Mexico, in carrying out activities along the border. The IBWC may undertake cooperative projects to implement existing treaties and other agreements between the two Governments. Projects may originate with the emergence of an environmental problem requiring the agreement and cooperation of the two Governments for a solution. Because of the international nature of the Rio Grande, the State of Texas has contracted with the U.S. Section of the IBWC to implement the CRP, including the Friends of the Rio Grande initiative, in its 1,254-mile international boundary section.

U.S. Fish and Wildlife Service

The United States Fish and Wildlife Service is a federal government agency within the United States Department of the Interior dedicated to the management of fish, wildlife, and habitats. The mission of the agency reads as "working with others to conserve, protect, and enhance fish, wildlife, plants and their habitats for the continuing benefit of the American people."The mission of the agency is to work with others to conserve, protect, and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people. The agency assists in the development and application of an environmental stewardship ethic, based on ecological principles, scientific knowledge of fish and wildlife, and a sense of moral responsibility. The agency guides the conservation, development, and management of the Nation's fish and wildlife resources and administers a national program to provide the public opportunities to understand, appreciate, and wisely use fish and wildlife resources. The USFWS is responsible for implementing the Endangered Species Act.

Chapter 6 Best Management Practices

NPS management programs in Texas make use of a wide variety of BMPs. This section provides an overview of the primary BMPs in use or identified for use in Texas. This is not a complete listing of all acceptable BMPs for NPS pollution control programs and projects in Texas. Whether or not projects receive funding under CWA §319(h), the use and demonstration of innovative practices not listed here are acceptable and valuable, particularly where their effectiveness can be evaluated and monitored.

Definition of Best Management Practices

NPS BMPs are activities, practices, and procedures undertaken to prevent or reduce water pollution. They are sometimes categorized as: preventative measures which are action or techniques to eliminate or reduce concentrations or pollutants from the runoff. Programs that implement these BMPs are addressed in Chapter 5.

There are many NPS BMPs in use in Texas. A separate document, the BMP Finder (*www.tceq.state.tx.us/compliance/monitoring/stakeholders/nps-stakeholders.html*) provides a more comprehensive description and discussion of important Texas NPS BMPs and guidance on their use. The BMP Finder is extensively cross-referenced to help in identifying and comparing BMPs which are closely related and to sort out the many different names and variations in BMPs which are currently in use. The "best" BMP to use depends on the particular needs or purposes to be addressed and the specific site characteristics.

The TSSWCB has determined that the implementation of a whole-farm water quality management plan based on the USDA-NRCS Field Office Technical Guide (FOTG), including all practices required to minimally meet the resource quality criteria for water quality at the resource management system level, represents the best available technology for preventing and abating agricultural and silvicultural NPS pollution in order to comply with the TSWQS (31 TAC §523.3(g)(2)). This means that the specific BMPs included in the USDA-NRCS FOTG are incorporated by reference as part of this *Texas NPS Management Program*.

Since most BMPs address specific management needs and site characteristics, it is helpful to identify and classify BMPs according to where they are most effective. The next section categorizes BMPs according to their use in managing the various parts of the NPS pollution pathway. The final section addresses which BMPs best address different activities and disturbances which are sources of NPS pollution.

Categories of Nonpoint Source Pollution Management

The management of NPS pollution involves a strategic combination of practices designed to prevent and intercept the entry of NPS pollutants into waters along the entire pathway. Most BMPs address one specific stage of this pathway, although they may be applied in different situations and to different sources. General categories of BMPs include:

- preventive practices: conceptual management or design practices which eliminate or reduce pollutants at the sources;
- cleanup practices: recapturing pollutants that have spilled onto or contaminated a location;
- runoff control practices: reducing the volume, velocity, and/or erosive force of storm water runoff flow (Low Impact Development);
- erosion control practices: protecting material at the soil surface from entering storm water runoff;
- sediment control practices: preventing materials already suspended in water from leaving a site;
- channel protection practices: preventing erosion of channels, stream banks, and streambeds;
- habitat restoration practices: restoring natural communities that minimize erosion and remove water pollutants, especially along a waterway and its riparian zone;
- in-stream remediation practices: removing NPS pollutants or restoring water quality characteristics in a waterway;
- abatement of contaminated groundwater seepage to reduce the flow into surface waters, and
- other BMPs, such as public education, may address two or more of these stages in the water pathway simultaneously.

For optimum effectiveness, NPS programs should attempt to coordinate BMPs with other governmental agencies, private sector interests, and stakeholder groups at the state and watershed level. BMPs can either complement each other - erosion control on a site typically increases the effectiveness and reduces the size and maintenance requirements of the site's sediment controls - or undermine each other - armoring a straight stretch of channel or stream banks may increase flow velocity and channel erosion downstream. In general, controlling NPS pollutants through prevention where possible is most cost effective. Control of these pollutants generally becomes more difficult and expensive the farther they travel down the storm water pathway.

Table 6.1 presents selected Texas BMPs in each of these categories along the storm water pathway.

Table 6.1 Best Management Practices by Category

Management Category and Description	Typical BMP Examples
Preventive BMPs Preventive BMPs, sometimes called source controls, are management techniques or designs that prevent or reduce the exposure of substances to precipitation, storm water, or surface waters. All policies and practices that prevent the release of materials to the open air, soil, or water are preventive BMPs. Such practices and safeguards comprise a large part of the rules, guidelines, and permit requirements for facility management and for the storage, transport, processing, and disposal of wastes and hazardous materials administered by TCEQ and other regulatory agencies.	Planning, policy, and regulatory activities Using alternate, less polluting materials Housekeeping to contain and cover materials and wastes, or keep them indoors Minimize the extent and duration of land disturbance activities Well plugging Groundwater seepage abatement and control Recycling and composting, including rainwater harvesting Household Hazardous Waste and similar collections
Cleanup BMPs Cleanup BMPs remove or remediate NPS pollutants which have contaminated a specific area. In most cases of significant contamination, the selection and implementation of these BMPs is governed specifically under agency rules. Other cleanup BMPs, such as cleanup of litter or illegally disposed materials, are more discretionary.	Spill response Contaminated site cleanup Trash-litter cleanup Increased-efficiency street sweeping Plugging of oil and gas wells Source removal
Run-on and Runoff Control/ LID BMPs Runoff and Run-on control BMPs reduce the volume, velocity, and erosive force of storm water through diversion, infiltration or absorption of storm water into the surface or through physical impediments which slow the flow of storm water.	Level spreaders, Permeable Pavement Bio-Retention and Bio-swales Rainwater Harvesting/Detention/Irrigation Vegetative filter strips, rain gardens, trash interceptors/separators, tree boxes, riparian buffers
Erosion Control BMPs Erosion control BMPs maintain the integrity of the land surface to prevent material at the surface from entering storm water or surface water.	Mulches and blankets Vegetation preservation and establishment Riprap on temporary traffic areas
Sediment Control BMPs For material that escapes erosion control BMPs and enters storm water runoff, the next line of defense is sediment control. Sediment control BMPs detain runoff before it leaves a site to filter out and/or precipitate suspended particles, including soluble pollutants which may be attached to solid particles.	Inlet protection Extended detention basins Vegetated filter strips Sediment trap/stone outlet Filter berms and silt fences Sand filter systems Constructed or restored wetlands

Management Category and Description	Typical BMP Examples
Channel, Stream Bank, and Streambed Protection BMPs These BMPs protect the integrity of stream beds and stream banks to prevent erosion and loss. Stream banks can be protected or restored either by increasing resistance of the bank to erosion or by decreasing the energy of the water at the point of contact with the bank, for example by deflecting or interrupting flows	Prevention of disturbance by exclusion of livestock, off-road vehicles, etc. Channel shaping to reduce velocity and erosive force Gabions or riprap lining of channels Reinforcing or armoring exposed surfaces Stream bank vegetation
Habitat Restoration BMPs These are a special subset of biological erosion control and stream protection BMPs. They establish or protect the natural communities which most effectively protect waterways and riparian areas from erosion.	Reestablish hydrology of wetlands and riparian areas Restoration of wetland native plant communities Riparian buffer, connecting streams or channels to floodplains
In-Stream and Lake Remediation BMPs Once NPS pollutants have affected a water body, another set of BMPs may reduce or reverse these effects.	Mechanical aeration to restore dissolved oxygen Chemical treatments - e.g. pH adjustment
Other BMPs	Public education

Categories of Nonpoint Sources and Associated Pollutants

BMPs can be classified not only by management category but also by the primary nonpoint sources of pollution and the types of pollutant loadings and other impacts that each of these sources tends to cause. Many BMPs are used to address a broad range of NPS sources, particularly the erosion and sediment control BMPs.

Major Sources

- agriculture;
- silviculture;
- urban storm water; and
- construction

Special Sources

- atmospheric deposition;
- boats and marinas;
- septic and other on-site wastewater systems;
- mining and petroleum production;
- industrial sites;
- roads;
- spill containment and contaminant remediation;

- hydromodification and stream bank protection;
- habitat degradation;
- wildlife;
- in-stream remediation; and
- underground storage tanks.

Table 6.2 Best Management Practices by Source

Sources and Activities	**Pollutants and Other Impacts**	**BMP Examples**
Agriculture Tilling, cultivation, harvesting, and other soil surface exposure and disturbances; chemical applications; livestock	Sediment from exposed soil; nutrients from fertilizers; chemicals from pesticides, streamflow and temperature increases caused by vegetation removal	Animal Mortality Facility, Alley Cropping, Brush Management, Closure of Waste, Impoundments, Composting Facility, Conservation Crop Rotation, Constructed Wetland, Contour Buffer Strips, Cover Crop, Cross Wind Stripcropping, Diversion Dam, Dike, Filter Strip, Firebreak, Grade Stabilization Structure, Grassed Waterway, Irrigation Land Leveling, Manure Transfer, Nutrient Management, Pest Management, Pond Sealing or Lining - Bentonite Treatment, Prescribed Grazing, Residue Management - No Till/strip till, Riparian Forest Buffer, Sediment Basin, Surface Roughening, Terrace, Use Exclusion, Waste Utilization, Water and Sediment Control Basin, Well Decommissioning
Silviculture/Forestry Timber road construction and use, timber harvesting, mechanical equipment operation, prescribed burning, site preparation, fertilizer and pesticide application	Sediment; nutrients from forest fertilizer application; chemicals from pesticide application; temperature changes resulting from riparian vegetation removal and sediment additions; and streamflow increases caused by vegetation removal.	Broad-Based Dips; Cross-Road Drainage Culverts; Haul Roads; Log Sets, Field Chipping Sets and Portable Mill Locations; Revegetation of Disturbed Areas; Rolling Dips; Skid Trails; Stream Crossings; Streamside Management Zones (SMZ); Salvage & Sanitation in SMZs; Water Bars; Wing Ditch

Sources and Activities	Pollutants and Other Impacts	BMP Examples
Urban and Industrial/Post-Construction Industrial, commercial, and residential activities; lawn and landscape management; pets and wildlife; pavement and other impervious covering of the soil; vehicular traffic; production and use of synthetic chemicals; improper disposal of wastes	Sediment from disturbed land; accelerated runoff from impervious surfaces; nutrients and pesticides from lawn and landscape management; pathogens and nutrients from pet and wildlife waste; oil and grease; petroleum hydrocarbons	Clean-Up; Composting; Animal Waste Collection; Curb Elimination; Debris Removal; Exposure Reduction; Landscaping And Lawn Maintenance Controls; Minimization Of Pollutants, Parking Lot/Street Cleaning Operations, Road Salt Controls, Streambank Stabilization, Bio-Retention & Bio-Swales, Buffers, Easements, Solid Waste Collection Facilities, Extended Detention Basin, Infiltration Trench, Oil and Grease Trap Device, Porous Pavement, Sand Filter, Rain Garden, Rainwater Harvesting/Reuse, Vegetative Practices, Filter Strip, Grassed Swale, Wetland, Wet Retention Pond

Sources and Activities	Pollutants and Other Impacts	BMP Examples
Construction Removal of the soil's protective cover; unpaved traffic surfaces; earthmoving; open stockpiling of erodible materials;	Sediment from bare soil and stockpiles; nutrients from temporary and permanent vegetation establishment; streamflow increases caused by vegetation removal and impervious ground coverings; waste chemicals and debris from painting and other construction wastes;	Minimize extent & duration of disturbance surface stabilization: Mulching, Preserving Natural Vegetation, Recontouring, Permanent Seeding, Riprap, Sodding, Surface Roughening, Temporary Gravel Construction Access, Temporary Seeding, Topsoiling, Erosion Control Compost, Erosion Control Blanket, Runoff Diversion Runoff conveyance measures: Grass-Lined Channel or Swale, Hardened Channel, Interceptor Swale, Temporary Slope Drain, Paved Flume, Runoff Diversion Dike Outlet protection: Level Spreader, Outlet Stabilization Structure Sediment traps and barriers: Block and Gravel Drop Inlet Protection, Excavated Drop Inlet Protection, Fabric Storm Drain Inlet Protection, Sediment Basin, Rock Dam, Sediment Fence/Straw Bale Barrier, Sediment Trap, Sand Filter System, Sod Drop Inlet Protection, Vegetated Filter Strip, Filter Berm (rock, sandbag, compost, mulch), Filter Sock (compost or mulch), Brush Barrier, Wetlands, Wet Basin, Extended Detention Basin Stream protection: Streambank Stabilization, Streambed Stabilization, Temporary Stream Crossing

Sources and Activities	Pollutants and Other Impacts	BMP Examples
Atmospheric deposition Forest fires, windblown dust, sea spray, the smelting of ores, and stack and fugitive dust emissions (dust that escapes emission controls). Nitrogen from microbial decomposition, combustion of fossil fuels, fertilizer and explosives factories, and volatilization of applied ammonia-based fertilizers, pesticides	Windblown pollutants of greatest concern include metals, such as mercury, and nitrogen.	Pollution prevention and emissions control measures to reduce the exposure and release of pollutants to the air; also pesticide management, erosion and sediment control BMPs reduce the entry of soil-bound pollutants, including those from atmospheric deposition, into storm water.
Boats and marinas Discharge of sewage, fish cleanings, and food waste from recreational boats; bilge from boat ballast; paints, pesticide, and wood preservatives; chemicals used to deter metal corrosion; biocidal antifouling agents; boat and marina construction; boat hull bottom painting and scrapings; boat operation and dredging activities; refueling activities and bilge or fuel discharges	biological oxygen demand and sediment oxygen demand; nutrients; pathogens; metals; arsenic from paint pigment, pesticide, and wood preservatives; zinc from anodes used to deter metal corrosion; copper and tin; copper and other metals. Both copper and tin (as butyltin) have been found at toxic concentrations in marina waters nationwide, deriving from boat hull bottom paints and scrapings; turbidity; petroleum hydrocarbons; oil and grease	Protected Shallow Water Habitats, Proper Storage and Handling of Materials, No-Discharge Zones, Pumpout Facilities (Fixed-Point, Portable, and Dedicated Slipside Systems), Boat Repair and Maintenance Restrictions, Solid Waste Collection Facilities, Fish Cleaning Facilities/Controls
Septic and other on-site wastewater systems Discharges, seepage, or other releases from malfunctioning or improperly installed on-site wastewater treatment systems	Nitrogen, phosphorus, organic matter, toxic chemicals, and bacterial and viral pathogens	Chemical Additive Restrictions, Elimination of Garbage Disposals, Inspection and Maintenance, Phosphorus Detergent Restrictions, Denitrification Systems, Floating Aquatic Plant (Aquaculture) Systems, Upgrade or Replacement of Failing Systems, Alternating Bed System, Mound (Fill) System, Pressure Distribution (Low Pressure Pipe) System, Point-of-Sale Inspections, Inspection and Permitting of Installed Systems, Local Ordinances
Mining and petroleum production	Salt, sediment, petroleum hydrocarbons	Well and Testhole Inspection; Plugging Wells and Testholes

Sources and Activities	Pollutants and Other Impacts	BMP Examples
Spill containment and contaminant remediation Spills, leaks, or other releases of chemicals and other pollutants	Petroleum hydrocarbons and other toxic chemicals	HHW and Empty Pesticide Container Collection, Storm Drain Stenciling, Spill Cleanup, Slurry Walls, Grouting, Geomembranes, Hydrodynamic Control, Surface Seals, Surface Drainage, Excavation, Soil Venting, In-Situ Treatment of Contaminants, Well Plugging, Trenching and Disposal, Groundwater Recovery and Disposal
Hydromodification and Stream bed/Stream bank protection Increased stream flow and erosive force can damage and erode stream channels	Sediment, organic matter, nutrients; reduced filtration, water temperature, reduced absorption of hydraulic energy, increased movement of pollutants	No-Wake Zones, Livestock Exclusion, Stream Bank Setbacks, Blankets and Mattresses, Branch Packs, Composite Revetment, Gabions, Live Fascines (Wattling Bundles), Live Staking, Tree Revetment, Vegetative Cover, Live Cribwall, Check Dam, Deflectors, Grade Stabilization Structure, Low-Head Dam (Weir), Levee Protection (vegetation and animal control), Hydraulic Structure, Flow Restrictor, Noneroding roadway
Underground storage tanks Spills, leaks, and other releases	Petroleum hydrocarbons and related chemicals	Slurry Walls, Grouting, Geomembranes, Surface Seals, Surface Drainage, Hydrodynamic Control, Pumping, Interceptor Systems, Soil Venting, Excavation, Biological Degradation, Chemical Degradation, Inspection

Appendix A Certification of Authority

CWA §319(b)(2)(D) requires that the Management Program include a certification of the attorney general of the state (or the chief attorney of any state water pollution control agency which has independent legal counsel) that the laws of the state provide adequate authority to implement the Management Program or, if there is not such adequate authority, a list of such additional authorities as will be necessary to implement the Management program.

For TCEQ, a letter from the agency's General Counsel is included.

For TSSWCB, a letter from the Office of the Attorney General is included.

Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*

Texas Commission on Environmental Quality

Protecting Texas by Reducing and Preventing Pollution

GENERAL COUNSEL'S CERTIFICATION

The State of Texas, through the Texas Commission on Environmental Quality (Commission or TCEQ), currently seeks full approval for the *Texas Nonpoint Source Management Program* (Management Program). The Environmental Protection Agency (EPA) has given full technical approval to the Management Program.

In accordance with the CWA (CWA), §319(b)(2)(D), each management program proposed for implementation must include the following:

> A certification of the attorney general of the State or States (or the chief attorney of any State water pollution control agency which has independent legal counsel) that the laws of the State or States, as the case may be, provide adequate authority to implement such management program or, if there is not such adequate authority, a list of such additional authorities as will be necessary to implement such management program.[1]

Following a review of the referenced 2012 Management Program, the General Counsel certifies, under CWA, §319(b)(2)((D), that the laws of the State of Texas provide adequate authority to implement the Management Program, as more specifically described below.

Relevant Legal Authority

The TCEQ is the state agency given primary responsibility for implementing the constitution and laws of the state relating to the conservation of natural resources and protection of the environment.[2] Furthermore, the TCEQ is the principal authority in the State of Texas on matters relating to the quality of water in the state, and all other state agencies engaged in water quality or water pollution control must coordinate their activities with the Commission.[3] Specifically, the Commission has general jurisdiction over the state's water quality programming, including:

- the issuance of permits;
- the enforcement of water quality rules, standards, orders, and permits; and
- water quality planning.[4]

[1] 33 U.S.C. 1329 (2011).
[2] Texas Water Code (TWC) § 5.012.
[3] TWC § 26.127.
[4] TWC § 5.013.

The Commission also has the power to perform any acts, whether specifically authorized by the TWC or other law, or implied by the TWC, that are necessary and convenient to the exercise of its jurisdiction and powers.[5]

Chapter 26 of the TWC provides that the Commission shall establish the level of quality to be maintained in, and shall control the quality of, the water in the state.[6] Waste discharges or impending waste discharges covered by the provisions of Chapter 26 are subject to reasonable rules or orders adopted or issued by the Commission in the public interest. The Commission has also been given the powers and duties specifically prescribed by Chapter 26 and all other powers necessary or convenient to carry out those statutory responsibilities.

Section 26.012 requires the Executive Director to prepare and develop a general, comprehensive plan for the control of water quality in the state, which shall be used as a flexible guide by the Commission. Additionally, §26.017 requires the Commission to do the following:

- encourage voluntary cooperation by the people, cities, industries, associations, agricultural interests, and representatives of other interests in preserving the greatest possible utility of water in the state;
- encourage the formation and organization of cooperative groups, associations, cities, industries, and other water users for the purpose of providing a medium to discuss and formulate plans for attainment of water quality control;
- establish policies and procedures for securing close cooperation among state agencies that have water quality control functions; and
- cooperate with the governments of the United States, other states, and with official or unofficial agencies and organizations with respect to water quality control matters.

Section 26.023 of the TWC provides that the Commission is the sole and exclusive authority for setting water quality standards, and must set water quality standards for the water in the state by rule, and may amend the standards from time to time. The standards must be based on all quality assured data obtained by the Commission, including local watershed and river basin databases. The Commission may also issue permits and amendments to permits for the discharge of waste or pollutants into or adjacent to water in the state, and may refuse to issue a permit when issuance would violate the provisions of any state or federal law, rule, or regulation.[7]

The Commission may prescribe reasonable requirements for a person making

[5] TWC § 5.102.
[6] TWC § 26.011.
[7] TWC § 26.027.

discharges of any waste or of any pollutant to monitor and report on his activities concerning collection, treatment, and disposal of the waste or pollutant.[8] The Executive Director has the responsibility for establishing a water quality sampling and monitoring program for the state. All other state agencies engaged in water quality or water pollution control activities are statutorily required to coordinate those activities with the Commission.[9] Additionally, the Commission and employees or agents of the Commission are authorized to enter any public or private property at any reasonable time for the purpose of inspecting and investigating conditions relating to the quality of water in the state.[10]

Local governments may also inspect the public water in its area and may execute cooperative agreements with the Commission or other local governments to provide for the performance of water quality management, inspection, and enforcement functions.[11] Municipalities may also establish a water pollution control and abatement program for the city to include services and functions which, in the judgment of the city or as may be reasonably required by the Commission, will provide effective water pollution control and abatement for the city.[12] Municipal water pollution control and abatement programs must be submitted to the Commission for review and approval.[13] Further, the Commission shall hold annual hearings in counties that include particularly sensitive areas, such as the Edwards Aquifer, to receive evidence on actions the Commission should take to protect the aquifer from pollution.[14] To further this goal, the Commission has adopted rules in Title 30, Texas Administrative Code (TAC) Chapter 213 that regulate development activities over the Edwards Aquifer.

The Commission also has broad authority over the location, design, construction, installation, and proper functioning of on-site sewage disposal systems[15] and has adopted corresponding rules in 30 TAC Chapter 285 to encourage the use of economically feasible alternative techniques and technologies.

TWC, Chapter 7 establishes the enforcement authority of the Commission. The Commission may initiate an action to enforce provisions of the TWC and Texas Health and Safety Code (THSC) within the jurisdiction of the Commission, as well as rules, orders, permits, or other decisions of the Commission.[16] The Commission may assess an administrative penalty against a person for violations with a maximum amount of $25,000 a day for each violation.[17] [18] If a person fails to comply, then the Commission or Executive Director may refer the matter to the Attorney General for enforcement.[19]

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[8] TWC § 26.042.
[9] TWC § 26.127.
[10] TWC § 26.014.
[11] TWC § 26.171 and § 26.175.
[12] TWC § 26.177.
[13] TWC § *Id*.
[14] TWC § 26.046.
[15] Tex. Health & Safety Code (THSC) § 366.011.
[16] TWC § 7.002.
[17] TWC § 7.051 and § 7.052.
[18] TWC § 7.061.
[19] TWC § 7.066.

Texas Department of Transportation

The Texas Department of Transportation (TxDOT) is the primary agency in the Sate responsible for highway, road, and bridge construction. As described in the 2012 Management Program, TxDOT's approach in addressing nonpoint source pollution is to limit impacts to receiving waters through implementation of highway design specifications. TxDOT has been conferred broad authority by the legislature.[20] TxDOT and TCEQ have entered into Memoranda of Understanding that have been adopted by reference in 30 TAC § 7.119 with regard to the assessment of water quality impacts resulting from certain transportation projects.

The Railroad Commission of Texas

The Railroad Commission of Texas (RRC) has primary responsibility for regulating the drilling of exploratory wells and oil and gas wells or any purpose in connection with them and the production of oil and gas. It is solely responsible for the control and disposition of waste and the abatement and prevention of surface and subsurface water pollution resulting from activities associated with the exploration, development, and production of oil and gas or geothermal resources, including:

- activities associated with the drilling of injection water source wells which penetrate the base of useable quality water;
- activities associated with the drilling of cathodic protection holes associated with the cathodic protection of wells and pipelines subject to the jurisdiction of the Railroad Commission of Texas;
- activities associated with gasoline plants, natural gas or natural gas liquids processing plants, pressure maintenance plants, or repressurizing plants;
- activities associated with any underground natural gas storage facility;
- activities associated with any underground hydrocarbon storage facility; and
- activities associated with the storage, handling, reclamation, gathering, transportation, or distribution of oil or gas before refining.[21]

To prevent pollution of streams and public bodies of surface water of the state, the

[20] Tex. Transp. Code, Chapter 201.
[21] TWC § 26.131.

Railroad Commission must adopt and enforce rules in accordance with Texas Natural Resource Code § 91.101 relating to the drilling of exploratory wells and oil and gas wells, TAC § 3.8 relating to water protection, and TAC § 3.91 relating to the cleanup of soil contaminated by crude oil spills. Additionally, TCEQ and the Railroad Commission have entered a MOU adopted by reference in 30 TAC § 7.117 concerning cooperation and the division of jurisdiction between the agencies regarding wastes that result from, or are related to, activities associated with the exploration, development, and production of oil, gas, or geothermal resources, and the refining of oil.

Texas Parks and Wildlife Department

The Texas Parks and Wildlife Department is authorized to regulate the use of department lands for oil, gas, and other mineral recovery and associated activities as the department considers reasonable and necessary to protect the surface estate. The Texas Parks and Wildlife is authorized by TWC § 26.129 to enforce the provisions of theTWC to the extent that any violation affects aquatic life and wildlife.

Wetlands

The United States Army Corps of Engineers (Corps) is the principle authority for all dredging operations affecting bays and estuaries of Texas. While EPA has designated the Corps as the implementing agency under CWA §404, the TCEQ is responsible for completing Section 401 Water Quality Certifications. The Commission has enacted regulations in 30 TAC Chapter 279 establishing procedures and criteria for applying for, processing, and reviewing state certifications under CWA, § 401, for activities under the jurisdiction of the agency for the purpose maintaining the chemical, physical, and biological integrity of the state's waters consistent with the TWC and the federal CWA. It is the policy of the Commission to achieve no overall net less of the existing wetlands resource base with respect wetlands functions and values in the State of Texas.

Spill Response

The *Texas Oil and Hazardous Substances Spill Prevention and Control Act* provides that it is the policy of the state to prevent the spill or discharge of hazardous substances into waters in the state and to cause the removal of any such spills and discharges without undue delay. [22] In accordance with the Act, the Commission is the lead agency in spill response matters and shall conduct spill response for the state, and shall otherwise administer the provisions of the Act. The Commission has also been designated by the Governor as the state's lead agency for Superfund activities and as the state's representative to the federal Regional Response Team in accordance with the *Comprehensive Environmental Response, Compensation, and Liability Act* 42U.S.C. §§ 9601-9675; the *Water Pollution Prevention and Control Act*, 33 U.S.C. §§ 12511387; and the *National Oil and Hazardous Substances Pollution Contingency Plan*, 40 CFR Part 300. Under the authority of the *Solid Waste Disposal Act*, the Commission has broad

[22] TWC Chapter 26, Subchapter G.

removal authorities with respect to the cleanup of a release or threatened release of hazardous substances at a facility on the state registry. [23]

Funding Mechanisms

The Executive Director, with the approval of the Commission, may execute agreements with the United States Environmental Protection Agency or any other federal agency that administers programs providing federal cooperation, assistance, grants, or loans for research, development, investigation, training, planning, studies, programming, and construction related to methods, procedures, and facilities for the collection, treatment, and disposal of waste and other water quality control activities. The Commission is authorized to accept federal funds for these purposes and for other purposes consistent with the objectives of Chapter 26 of the TWC and may use the funds as prescribed by law or as provided by agreement.

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Les Trobman

General Counsel

Texas Commission on Environmental Quality

[23] THSC Chapter 361.

ATTORNEY GENERAL OF TEXAS

GREG ABBOTT

April 17, 2012

Mr. Rex Isom
Executive Director
Texas State Soil and Water Conservation Board
P.O. Box 658
Temple, Texas 76503

Re: 2012 Texas Nonpoint Source Management Program

Dear Mr. Isom:

I have reviewed the above statewide management program document provided to me by your staff.

As you know, the Texas State Soil and Water Conservation Board's statutory authority is contained in Chapters 201 of the Texas Agricultural Code. Section 201.026 of the Code gives the Board specific authority to "plan, implement, and manage programs and practices for abating agricultural and silvicultural nonpoint source pollution." Texas law, therefore, provides adequate authority for your agency to promulgate and implement the 2012 Texas Nonpoint Source Management Program.

Please let me know if I can assist you further.

Sincerely,

George C. Noelke
Assistant Attorney General
Administrative Law Division
Telephone: (512) 475-3206
Facsimile: (512) 320-0267

GCN/jlm

Appendix B CWA §319

(Section 319 added by Public Law 100-4)

(a) State Assessment Reports. -

(1) Contents. - The Governor of each state shall, after notice and opportunity for public comment, prepare and submit to the Administrator for approval, a report which:

(A) identifies those navigable waters within the state which, without additional action to control nonpoint sources of pollution, cannot reasonably be expected to attain or maintain applicable water quality standards or the goals and requirements of this Act;

(B) identifies those categories and subcategories of nonpoint source or, where appropriate, particular nonpoint sources which add significant pollution to each portion of the navigable waters identified under subparagraph (A) in amounts which contribute to such portion not meeting such water quality standards or such goals and requirements;

(C) describes the process, including intergovernmental coordination and public participation, for identifying best management practices and measures to control each category and subcategory of nonpoint sources and, where appropriate, particular nonpoint sources identified under subparagraph (B) and to reduce, to the maximum extent practicable, the level of pollution resulting from such category, subcategory, or source; and

(D) identifies and describes state and local programs for controlling pollution added from nonpoint sources to, and improving the quality of, each such portion of the navigable waters, including but not limited to those programs which are receiving Federal assistance under subsections (h) and (I).

(2) Information Used in Preparation. - In developing the report required by this section, the state (A) may rely upon information developed pursuant to 208, §§303(e), 304(F), 305(B), **AND** 314, and other information as appropriate, and (B) may utilize appropriate elements of the waste treatment management plans developed pursuant to §208(b) **AND** §303, to the extent such elements are consistent with and fulfill the requirements of this section.

(b) State Management Programs. -

(1) In General. - The Governor of each state, for that state or in combination with adjacent states, shall, after notice and opportunity for public comment, prepare and submit to the Administrator for approval a management program which such state proposes to implement in the first four fiscal years beginning after the date of submission of such management program for controlling pollution added from nonpoint sources to the navigable waters within the state and improving the quality of such waters.

(2) Specific Contents. - Each management program proposed for implementation under this subsection shall include each of the following:

(A) An identification of the best management practices and measures which will be undertaken to reduce pollutant loadings resulting from each category, subcategory, or particular nonpoint source designated under paragraph (1)(B), taking into account the impact of the practice on ground water quality.

(B) An identification of programs (including, as appropriate, nonregulatory or regulatory programs for enforcement, technical assistance, financial assistance, education, training, technology transfer, and demonstration projects) to achieve implementation of the best management practices by the categories, subcategories, and particular nonpoint source designated under subparagraph (A).

(C) A schedule containing annual milestones for (I) utilization of the program implementation methods identified in subparagraph (B), and (ii) implementation of the best management practices identified in subparagraph (A) by the categories, subcategories, or particular nonpoint sources designated under paragraph (1)(B). Such schedule shall provide for utilization of the best management practices at the earliest practicable date.

(D) A certification of the attorney general of the state or states (or the chief attorney of any state water pollution control agency which has independent legal counsel) that the laws of the state or states, as the case may be, provide adequate authority to implement such management program or, if there is not such adequate authority, a list of such additional authorities as will be necessary to implement such management program. A schedule and commitment by the state or states to seek such additional authorities as expeditiously as practicable.

(E) Sources of Federal and other assistance and funding (other than assistance provided under subsections (h) and (I)) which will be available in each of such fiscal years for supporting implementation

of such practices and measures and the purposes for which such assistance will be used in each of such fiscal years.

(F) An identification of Federal financial assistance programs and Federal development projects for which the state will review individual assistance applications or development projects for their effect on water quality pursuant to the procedures set forth in Executive Order 12372 as in effect on September 17, 1983, to determine whether such assistance applications or development projects would be consistent with the program prepared under this subsection; for the purposes of this subparagraph, identification shall not be limited to the assistance programs or development projects subject to Executive Order 12372 but may include any programs listed in the most recent Catalog of Federal Domestic Assistance which may have an effect on the purposes and objectives of the state's nonpoint source pollution management program.

(3) Utilization of Local and Private Experts. - In development developing and implementing a management program under this subsection, a state shall, to the maximum extent practicable, involve local public and private agencies and organizations which have expertise in control of nonpoint sources of pollution.

(4) Development on Watershed Basis. - A state shall, to the maximum extent practicable, develop and implement a management program under this subsection on a watershed-by-watershed basis within such state.

(c) Administrative Provisions. -

(1) Cooperation Requirement. - Any report required by subsection (a) and any management program and report required by subsection (b) shall be developed in cooperation with local, substate regional, and interstate entities which are actively planning for the implementation of nonpoint source pollution controls and have either been certified by the Administrator in accordance with §208, have worked jointly with the state on water quality management planning under §205(j), or have been designated by the state legislative body or Governor as water quality management planning agencies for their geographic areas.

(2) Time Period for Submission of Reports and Management Programs. - Each report and management program shall be submitted to the Administrator during the 18-month period beginning on the date of the enactment of this section.

(d) Approval or Disapproval of Reports and Management Programs. -

(1) Deadline. - Subject to paragraph (2), not later than 180 days after the

date of submission to the Administrator of any report or management program under this section (other than subsections (h), (I), and (k)), the Administrator shall either approve or disapprove such report or management program, as the case may be. The Administrator may approve a portion of a management program under this subsection. If the Administrator does not disapprove a report, management program, or portion of a management program in such 180-day period, such report, management program, or portion shall be deemed approved for purposes of this section.

(2) Procedure for Disapproval. - If, after notice and opportunity for public comment and consultation with appropriate federal and state agencies and other interested persons, the Administrator determines that -

(A) the proposed management program or any portion thereof does not meet the requirements of subsection (b)(2) of this section or is not likely to satisfy, in whole or in part, the goals and requirements of the Act;

(B) adequate authority does not exist, or adequate resources are not available, to implement such program or portion;

(C) the schedule for implementing such program or portion is not sufficiently expeditious; or

(D) the practices and measures proposed in such program or portion are not adequate to reduce the level of pollution in navigable waters in the state resulting from nonpoint sources and to improve the quality of navigable waters in the state; the Administrator shall within 6 months of receipt of the proposed program notify the state of any revisions or modifications necessary to obtain approval. The state shall thereupon have an additional 3 months to submit its revised management program and the Administrator shall approve or disapprove such revised program within three months of receipt.

(3) Failure of state to Submit Report. - If a Governor of state does not submit the report required by subsection (a) within the period specified by subsection (c)(2), the Administrator shall, within 30 months after the date of the enactment of this section, prepare a report for such state which makes the identifications required by paragraphs (1)(A) and (1)(B) of subsection (a). Upon completion of the requirement of the preceding sentence and after notice and opportunity for comment, the Administrator shall report to Congress on his actions pursuant to this section.

(e) Local Management Programs; Technical Assistance. - If a state fails to submit a management program under subsection (b) or the Administrator does not

approve such a management program, a local public agency or organization which has expertise in, and authority to, control water pollution, resulting from nonpoint sources in any area of such state which the Administrator determines is of sufficient geographic size may, with approval of such state, request the Administrator to provide, and the Administrator shall provide, technical assistance to such agency or organization in developing for such area a management program which is described in subsection (b) and can be approved pursuant to subsection (d). After development of such management program, such agency or organization shall submit such management program to the Administrator for approval. If the Administrator approves such management program, such agency or organization shall be eligible to receive financial assistance under subsection (h) for implementation of such management program as if such agency or organization were a state for which a report submitted under subsection (a) and a management program submitted under subsection (b) were approved under this section. Such financial assistance shall be subject to the same terms and conditions as assistance provided to a state under subsection (h).

(f) Technical Assistance for States. - Upon request of a state, the Administrator may provide technical assistance to such state in developing a management program approved under subsection (b) for those portions of the navigable waters requested by such state.

(g) Interstate Management Conference. -

> (1) Convening of Conference; Notification; Purpose. - If any portion of the navigable waters in any state which is implementing a management program approved under this section is not meeting applicable water quality standards or the goals and requirements of the Act as a result, in whole or in part, of pollution from nonpoint sources in another state, such state may petition the Administrator to convene, and the Administrator shall convene, a management conference of all states which contribute significant pollution resulting from nonpoint sources to such portion. If, on the basis of information available, the Administrator determines that a state is not meeting applicable water quality standards or the goals and requirements of this Act as a result, in whole or in part, of significant pollution from nonpoint sources in another state, the administrator shall notify such state. The Administrator may convene a management conference under this paragraph not later than 180 days after giving such notification, whether or not the state which is not meeting such standards requests such conference. The purpose of such conference shall be to develop an agreement among such states to reduce the level of pollution in such portion resulting from nonpoint sources and to improve the water quality of such portion. Nothing in such agreement shall supersede or abrogate rights to quantities of water which have been established by interstate water compacts, Supreme Court decrees, or state water laws. This subsection shall not apply to any pollution which is subject to the

Colorado River Basin Salinity control Act. The requirement that the Administrator convene a management conference shall not be subject to the provisions of Section505 of this Act.

(2) State Management Program Requirement. - To the extent that the states reach agreement through such conference, the management programs of the states which are parties to such agreements and which contribute significant pollution to the navigable water or portions thereof not meeting applicable water quality standards or goals and requirements of the Act will be revised to reflect such agreement. Such a management program shall be consistent with federal and state law.

(h) Grant Program. -

(1) Grants for Implementation of Management Programs. - Upon application of a state for which a report submitted under subsection (a) and a management program submitted under subsection (b) is approved under this section, the Administrator shall make grants, subject to such terms and conditions as the Administrator considers appropriate, under this subsection to such state for the purpose of assisting the state in implementing such management program. Funds reserved pursuant to §205(j)(5) of this Act may be used to develop and implement such management program.

(2) Applications. - An application for a grant under this subsection in any fiscal year shall be in such form and shall contain such other information as the Administrator may require, including an identification and description of the best management practices and measures which the state proposes to assist, encourage, or require in such year with the Federal assistance to be provided under the grant.

(3) Federal Share. - The Federal share of the cost of each management program implemented with Federal assistance under this subsection in any fiscal year shall not exceed 60% of the cost incurred by the state in implementing such management program and shall be made on condition that the non-Federal share is provided from non-Federal sources.

(4) Limitation on Grant Amounts. - Notwithstanding any other provision of this subsection, not more than 15% of the amount appropriated to carry out this subsection may be used to make grants to any one state, including any grants to any local public agency or organization with authority to control pollution from nonpoint sources in any area of such state.

(5) Priority for Effective Mechanisms. - For each fiscal year beginning after September 30, 1987, the Administrator may give priority in making grants under this subsection, and shall give consideration in determining the Federal share of any such grant, to states which have implemented or are

proposing to implement management programs which will -

(A) control particularly difficult or serious nonpoint source pollution problems, including, but not limited to, problems resulting from mining activities;

(B) implement innovative methods or practices for controlling nonpoint sources of pollution, including regulatory programs where the Administrator deems appropriate;

(C) control interstate nonpoint source pollution problems; or

(D) carry out ground water quality protection activities which the Administrator determines are part of a comprehensive nonpoint source pollution control program, including research, planning, ground water assessments, demonstration programs, enforcement, technical assistance, education, and training to protect ground water quality from nonpoint sources of pollution.

(6) Availability for Obligation. - The funds granted to each state pursuant to this subsection in a fiscal year shall remain available for obligation by such state for the fiscal year for which appropriated. The amount of any such funds not obligated by the end of such fiscal year shall be available to the Administrator for granting to other states under this subsection in the next fiscal year.

(7) Limitation on Use of Funds. - States may use funds from grants made pursuant to this section for financial assistance to persons only to the extent that such assistance is related to the costs of demonstration projects.

(8) Satisfactory Progress. - No grant may be made under this subsection in any fiscal year to a state which in the preceding fiscal year received a grant under this subsection unless the Administrator determines that such state made satisfactory progress in such preceding fiscal year in meeting the schedule specified by such state under subsection (b)(2).

(9) Maintenance of Effort. - No grant may be made to a state under this subsection in any fiscal year unless such state enters into such agreements with the Administrator as the Administrator may require to ensure that such state will maintain its aggregate expenditures from all other sources for programs for controlling pollution added to the navigable waters in such state from nonpoint sources and improving the quality of such waters at or above the average level of such expenditures in its two fiscal years preceding the date of enactment of this subsection.

(10) Request for Information. - The Administrator may request such

information, data, and reports as he considers necessary to make the determination of continuing eligibility for grants under this section.

(11) Reporting and Other Requirements. - Each state shall report to the Administrator on an annual basis concerning (a) its progress in meeting the schedule of milestones submitted pursuant to subsection (b)(2)(c) of this section, and (B) to the extent that appropriate information is available, reductions in nonpoint source pollutant loading and improvements in water quality for those navigable waters or watersheds within the state which were identified pursuant to subsection (a)(1)(a) of this section resulting from implementation of the management program.

(12) Limitation on Administrative Costs. - For purposes of this subsection, administrative costs in the form of salaries, overhead, or indirect costs for services provided and charged against activities and programs carried out with a grant under this subsection shall not exceed in any fiscal year 10% of the amount of the grant in such year, except that costs of implementing enforcement and regulatory activities, education, training, technical assistance, demonstration projects, and technology transfer programs shall not be subject to this limitation.

(i) Grants for Protecting Groundwater Quality. -

(1) Eligible Applicants and Activities. - Upon application of a state for which a report submitted under subsection (a) and a plan submitted under subsection (b) is approved under this section, the Administrator shall make grants under this subsection to such state for the purpose of assisting such state in carrying out groundwater quality protection activities which the Administrator determines will advance the state toward implementation of a comprehensive nonpoint source pollution control program. Such activities shall include, but not be limited to, research planning, groundwater assessments, demonstration programs, enforcement, technical assistance, education and training to protect the quality of groundwater and to prevent contamination of groundwater from nonpoint sources of pollution.

(2) Applications. - An application for a grant under this subsection shall be in such form and shall contain such information as the Administrator may require.

(3) Federal Share; Maximum Amount. - The Federal share of the cost of assisting a state in carrying out groundwater protection activities in any fiscal year under this subsection shall be 50% of the costs incurred by the state in carrying out such activities, except that the maximum amount of Federal assistance which any state may receive under this subsection in any fiscal year shall not exceed $150,000.

(4) Report. - The Administrator shall include in each report transmitted under subsection (m) a report on the activities and programs implemented under this subsection during the preceding fiscal year.

(j) Authorization of Appropriations. - There is authorized to be appropriated to carry out subsections (h) and (I) not to exceed $70,000,000 for fiscal year 1988, $100,000,000 per fiscal year for each of fiscal years 1989 and 1990, and $130,000,000 for fiscal year 1991; except that for each of such fiscal years not to exceed $7,500,000 may be made available to carry out subsection (I). Sums appropriated pursuant to this subsection shall remain available until expended.

(k) Consistency of Other Programs and Projects With Management Programs. - The Administrator shall transmit to the Office of Management and Budget and the appropriate Federal departments and agencies a list of those assistance programs and development projects identified by each state under subsection (b)(2)(F) for which individual assistance applications and projects will be reviewed pursuant to the procedures set forth in Executive Order 12372 as in effect on September 17, 1983, the concerns of the state regarding the consistency of such applications or projects with the state nonpoint source pollution management program.

(l) Collection of Information. - The Administrator shall collect and make available, through publications and other appropriate means, information pertaining to management practices and implementation methods, including, but not limited to, (1) information concerning the costs and relative efficiencies of best management practices for reducing nonpoint source pollution; and (2) available data concerning the relationship between water quality and implementation of various management practices to control nonpoint sources of pollution.

(m) Reports of Administrator. -

(1) Annual Reports. - Not later than January 1, 1988, and each January 1 thereafter, the Administrator shall transmit to the Committee on Public Works and Transportation of the House of Representatives and the Committee on Environment and Public Works of the Senate, a report for the preceding fiscal year on the activities and programs implemented under this section and the progress made in reducing pollution in the navigable waters resulting from nonpoint sources and improving the quality of such waters.

(2) Final Report. - Not later than January 1, 1990, the Administrator shall transmit to Congress a final report on the activities carried out under this section. Such report, at a minimum, shall -

(A) describe the management programs being implemented by the states by types and amount of affected navigable waters, categories

and subcategories of nonpoint sources, and types of best management practices being implemented;

(B) describe the experiences of the states in adhering to schedules and implementing best management practices;

(C) describe the amount and purpose of grants awarded pursuant to subsections (h) and (I) of this section;

(D) identify, to the extent that information is available, the progress made in reducing pollutant loads and improving water quality in the navigable waters;

(E) indicate what further actions need to be taken to attain and maintain in those navigable waters (I) applicable water quality standards; and (ii) the goals and requirements of this Act;

(F) include recommendations of the Administrator concerning future programs (including enforcement programs) for controlling pollution from nonpoint sources; and

(G) identify the activities and programs of departments, agencies, and instrumentalities of the United States which are inconsistent with the management programs submitted by the states and recommend modifications so that such activities and programs are consistent with and assist the states in implementation of such management programs.

(n) Set Aside for Administrative Personnel. - Not less than 5% of the funds appropriated pursuant to subsection (j) for any fiscal year shall be available to the Administrator to maintain personnel levels at the Environmental Protection Agency at levels which are adequate to carry out this section in such year.

Appendix C NPS Priority Watersheds Report

Table C.1 Definition of Terms for Priority Watersheds Report

Term		Definition
SEGMENT & AU		Segment and Assessment Unit number from the Texas Integrated Report (IR).
SEGMENT NAME		Segment Name from the IR.
IMPAIRMENT		Water quality impairment from the IR; or water quality issue identified by the WAP partners for a special interest (SI) water body.
IR CATEGORY		Assessment category from the IR; or a special interest (SI) water body identified by the WAP partners.
WAP STRATEGY		Coordinated series of actions undertaken to address water quality issues.
	Monitoring	More data is needed in order to determine the severity and/or area of the impairment before determining the most appropriate restoration activity.
	Evaluation	A more comprehensive, site-specific analysis than the one conducted for the IR is required.
	WQS Review	Evaluate the appropriateness of the designated use or criterion.
	TMDL/I-Plan	A Total Maximum Daily Load (TMDL) and Implementation Plan determine the assimilative capacity, allocate loads, and identify the actions necessary to achieve water quality standards.
	WPP	A Watershed Protection Plan (WPP) coordinates water quality protection programs and projects designed to meet water quality standards.
	Other	The impairment cannot be addressed by one or more of the other identified strategies.
STATUS		An evaluation of progress toward implementing the strategy.
	Consulting	Before proceeding, additional guidance and input is needed from watershed stakeholders or other experts.
	Planning	Project or activity to execute the strategy is being planned, but funding is not yet secured or contract not yet in place.
	Scheduled	Funding is secured and contract in place to implement the strategy, but work has not yet been initiated.
	Underway	Activities needed to execute strategy have been initiated.
	Completed	Activities needed to execute strategy have been completed.
	Reassessment	Pending reassessment under the next iteration of the IR.
	TBD	The Lead will seek more information in order to document the current status.
LEAD		Entity responsible for coordinating strategy according to WAP process.
	TCEQ – WAP	Texas Commission on Environmental Quality – Watershed Action Planning group

Term		Definition
	TCEQ – NPS	Texas Commission on Environmental Quality – Nonpoint Source Program
	TCEQ – TMDL	Texas Commission on Environmental Quality – Total Maximum Daily Load Program
	TCEQ – WQS	Texas Commission on Environmental Quality – Water Quality Standards Program
	TCEQ – GBEP	Texas Commission on Environmental Quality – Galveston Bay Estuary Program
	TCEQ – SWQM	Texas Commission on Environmental Quality – Surface Water Quality Monitoring Program
	TCEQ – CRP	Texas Commission on Environmental Quality – Clean Rivers Program
	TSSWCB – SRM	Texas State Soil and Water Conservation Board – Statewide Resource Management group
	3rd Party	An organization or program other than one of the TCEQ or TSSWCB programs identified.
SI		Special Interest water body

Table C.2 Priority Watersheds Report

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
0101A_01	Dixon Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TSSWCB - SRM
0101B_01	Rock Creek (unclassified water body)	bacteria	5c	Evaluation	Consulting	TCEQ - WAP
0103_01	Canadian River Above Lake Meredith	chloride	5c	WQS Review	Scheduled	TCEQ - WQS
0103_02	Canadian River Above Lake Meredith	chloride	5c	WQS Review	Scheduled	TCEQ - WQS
0103_03	Canadian River Above Lake Meredith	chloride	5c	WQS Review	Scheduled	TCEQ - WQS
0103C_01	Unnamed Tributary to West Amarillo Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TSSWCB - SRM
0104_02	Wolf Creek	bacteria	5b	Evaluation	Planning	TCEQ - WQS
0201A_01	Mud Creek (unclassified water body)	bacteria	5c	WQS Review	Planning	TSSWCB - SRM
0201A_01	Mud Creek (unclassified water body)	depressed dissolved oxygen	5c	WQS Review	Planning	TCEQ - WQS
0202A_01	Bois D' Arc Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
0202A_02	Bois D' Arc Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
0202F_01	Choctaw Creek (unclassified water body)	bacteria	5b	Evaluation	Underway	TCEQ - WQS
0202F_02	Choctaw Creek (unclassified water body)	bacteria	5b	Evaluation	Underway	TCEQ - WQS
0202G_01	Smith Creek (unclassified water body)	bacteria	5b	Evaluation	Underway	TCEQ - WQS
0202K_01	Iron Ore Creek (unclassified water body)	bacteria	5b	Evaluation	Underway	TCEQ - WQS
0206B_01	South Groesbeck Creek (unclassified water body)	bacteria	5b	Evaluation	Underway	TCEQ - WQS
0207_04	Lower Prairie Dog Town Fork Red River	bacteria	5b	WQS Review	Planning	TCEQ - WQS
0207A	Buck Creek	SI	SI	WPP	Underway	TSSWCB - SRM
0214_02	Wichita River Below Diversion Lake Dam	bacteria	5c	Evaluation	Underway	TCEQ - WQS
0214_05	Wichita River Below Diversion Lake Dam	bacteria	5c	Evaluation	Underway	TCEQ - WQS
0214A_02	Beaver Creek (unclassified water body)	bacteria	5b	Evaluation	Underway	TCEQ - WQS
0214B_01	Buffalo Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TSSWCB - SRM
0222_01	Salt Fork Red River	bacteria	5b	Monitoring	Underway	TCEQ - CRP
0224A_01	McClellan Creek (unclassified water body)	bacteria	5b	Evaluation	Underway	TCEQ - WQS
0226_01	South Fork Wichita River	chloride	5c	WQS Review	Scheduled	TCEQ - WQS
0226_02	South Fork Wichita River	chloride	5c	WQS Review	Scheduled	TCEQ - WQS
0226_03	South Fork Wichita River	chloride	5c	WQS Review	Scheduled	TCEQ - WQS
0226_04	South Fork Wichita River	chloride	5c	WQS Review	Scheduled	TCEQ - WQS
0230A_03	Paradise Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TSSWCB - SRM
0299A_01	Sweetwater Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TSSWCB - SRM
0303B_01	White Oak Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
0303B_04	White Oak Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
0304A_01	Swampoodle Creek (unclassified water body)	impaired fish community	5b	Monitoring	Underway	TCEQ - SWQM
0304A_01	Swampoodle Creek (unclassified water body)	impaired macrobenthic community	5b	Monitoring	Underway	TCEQ - SWQM
0304B_01	Cowhorn Creek (unclassified water body)	impaired fish community	5b	Monitoring	Underway	TCEQ - SWQM
0304B_01	Cowhorn Creek (unclassified water body)	impaired macrobenthic community	5b	Monitoring	Underway	TCEQ - SWQM
0401_02	Caddo Lake	depressed dissolved oxygen	5c	WPP	Underway	TCEQ - NPS
0401_03	Caddo Lake	depressed dissolved oxygen	5c	WPP	Underway	TCEQ - NPS
0401_03	Caddo Lake	pH	5b	WQS Review, WPP	Underway	TCEQ - WQS
0401_05	Caddo Lake	depressed dissolved oxygen	5c	WPP	Underway	TCEQ - NPS
0401_07	Caddo Lake	depressed dissolved oxygen	5c	WPP	Underway	TCEQ - NPS
0401A_01	Harrison Bayou (unclassified water body)	depressed dissolved oxygen	5b	WQS Review, WPP	Underway	TCEQ - WQS
0402_01	Big Cypress Creek Below Lake O' the Pines	pH	5b	WQS Review, WPP	Underway	TCEQ - WQS
0402_02	Big Cypress Creek Below Lake O' the Pines	depressed dissolved oxygen	5b	WQS Review, WPP	Planning	TCEQ - WQS
0402A_01	Black Cypress Bayou (unclassified water body)	depressed dissolved oxygen	5b	WQS Review, WPP	Underway	TCEQ - WQS
0402A_02	Black Cypress Bayou (unclassified water body)	depressed dissolved oxygen	5b	WQS Review, WPP	Underway	TCEQ - WQS
0402A_03	Black Cypress Bayou (unclassified water body)	depressed dissolved oxygen	5b	WQS Review, WPP	Underway	TCEQ - WQS
0402A_04	Black Cypress Bayou (unclassified water body)	bacteria	5c	WPP	Underway	TCEQ - NPS
0402A_05	Black Cypress Bayou (unclassified water body)	depressed dissolved oxygen	5b	WQS Review, WPP	Underway	TCEQ - WQS

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
0403_04	Lake O' the Pines	depressed dissolved oxygen	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0404_02	Big Cypress Creek Below Lake Bob Sandlin	bacteria	5c	WQS Review	Underway	TSSWCB - SRM
0404B_01	Tankersley Creek (unclassified water body)	bacteria	5c	WQS Review	Underway	TSSWCB - SRM
0404C_01	Hart Creek (unclassified water body)	bacteria	5c	WQS Review	Underway	TSSWCB - SRM
0406_01	Black Bayou	bacteria	5c	Evaluation	Consulting	TCEQ - WAP
0407_01	James' Bayou	depressed dissolved oxygen	5b	WQS Review, WPP	Underway	TCEQ - WQS
0407_01	James' Bayou	pH	5b	WQS Review, WPP	Underway	TCEQ - WQS
0407_02	James' Bayou	bacteria	5c	WPP	Underway	TCEQ - NPS
0407_02	James' Bayou	depressed dissolved oxygen	5b	WQS Review, WPP	Underway	TCEQ - WQS
0409_01	Little Cypress Bayou (Creek)	depressed dissolved oxygen	5b	WQS Review, WPP	Underway	TCEQ - WQS
0409_02	Little Cypress Bayou (Creek)	bacteria	5c	WPP	Underway	TCEQ - NPS
0409_02	Little Cypress Bayou (Creek)	depressed dissolved oxygen	5b	WQS Review, WPP	Underway	TCEQ - WQS
0409_03	Little Cypress Bayou (Creek)	bacteria	5c	WPP	Underway	TCEQ - NPS
0409_03	Little Cypress Bayou (Creek)	depressed dissolved oxygen	5b	WQS Review, WPP	Underway	TCEQ - WQS
0409_04	Little Cypress Bayou (Creek)	bacteria	5c	WPP	Underway	TCEQ - NPS
0409B_01	South Lilly Creek (unclassified water body)	bacteria	5c	WPP	Underway	TCEQ - NPS
0501B_01	Little Cypress Bayou (unclassified water body)	bacteria	5c	WQS Review	Planning	TCEQ - WQS
0501B_01	Little Cypress Bayou (unclassified water body)	depressed dissolved oxygen	5c	Monitoring	Planning	TCEQ - WAP
0501B_02	Little Cypress Bayou (unclassified water body)	bacteria	5c	WQS Review	Planning	TCEQ - WQS
0501B_02	Little Cypress Bayou (unclassified water body)	depressed dissolved oxygen	5c	Monitoring	Planning	TCEQ - WAP
0501B_03	Little Cypress Bayou (unclassified water body)	bacteria	5c	WQS Review	Planning	TCEQ - WQS
0501B_03	Little Cypress Bayou (unclassified water body)	depressed dissolved oxygen	5c	Monitoring	Planning	TCEQ - WAP
0502A_01	Nichols Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
0502A_01	Nichols Creek (unclassified water body)	depressed dissolved oxygen	5c	Evaluation	Underway	TCEQ - SWQM

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
0502B_02	Caney Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
0505_04	Sabine River Above Toledo Bend Reservoir	bacteria	5a	Evaluation	Consulting	TCEQ - TMDL
0505B_02	Grace Creek (unclassified water body)	depressed dissolved oxygen	5c	Evaluation	Reassessment	TCEQ - SWQM
0505G_01	Wards Creek (unclassified water body)	depressed dissolved oxygen	5c	Monitoring	Planning	TCEQ - WAP
0506A_01	Harris Creek (unclassified water body)	depressed dissolved oxygen	5b	WQS Review	Planning	TCEQ - WQS
0508_01	Adams Bayou Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0508_01	Adams Bayou Tidal	depressed dissolved oxygen	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0508_02	Adams Bayou Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0508_02	Adams Bayou Tidal	depressed dissolved oxygen	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0508_03	Adams Bayou Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0508_03	Adams Bayou Tidal	depressed dissolved oxygen	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0508_04	Adams Bayou Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0508_04	Adams Bayou Tidal	depressed dissolved oxygen	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0508A_01	Adams Bayou Above Tidal (unclassified water body)	depressed dissolved oxygen	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0508B_01	Gum Gully (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0508B_01	Gum Gully (unclassified water body)	depressed dissolved oxygen	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0508C_01	Hudson Gully (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0508C_01	Hudson Gully (unclassified water body)	depressed dissolved oxygen	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0511_01	Cow Bayou Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0511_02	Cow Bayou Tidal	depressed dissolved oxygen	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0511_03	Cow Bayou Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0511_03	Cow Bayou Tidal	depressed dissolved oxygen	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0511_03	Cow Bayou Tidal	pH	4a	TMDL/I-Plan	Underway	TCEQ - TMDL

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
0511_04	Cow Bayou Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0511_04	Cow Bayou Tidal	depressed dissolved oxygen	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0511_04	Cow Bayou Tidal	pH	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0511A_02	Cow Bayou Above Tidal (unclassified water body)	depressed dissolved oxygen	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0511B_01	Coon Bayou (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0511B_01	Coon Bayou (unclassified water body)	depressed dissolved oxygen	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0511C_01	Cole Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0511C_01	Cole Creek (unclassified water body)	depressed dissolved oxygen	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0511E_01	Terry Gully (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0512A_01	Running Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
0512B_01	Elm Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
0514_01	Big Sandy Creek	bacteria	5c	Evaluation	Consulting	TCEQ - WAP
0514_02	Big Sandy Creek	bacteria	5c	Evaluation	Consulting	TCEQ - WAP
0604A_02	Cedar Creek (unclassified water body)	bacteria	5b	Evaluation	Consulting	TCEQ - WAP
0604B_01	Hurricane Creek (unclassified water body)	bacteria	5b	Evaluation	Consulting	TCEQ - WAP
0604C_01	Jack Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
0604D_01	Piney Creek (unclassified water body)	depressed dissolved oxygen	5c	Monitoring	Underway	TCEQ - SWQM
0604M_02	Biloxi Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
0604M_03	Biloxi Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
0604M_03	Biloxi Creek (unclassified water body)	depressed dissolved oxygen	5c	Evaluation	Underway	TCEQ - SWQM
0605A_01	Kickapoo Creek in Henderson County (unclassified water body)	bacteria	5c	WQS Review	Planning	TCEQ - WQS
0606_01	Neches River Above Lake Palestine	bacteria	5c	WQS Review	Planning	TCEQ - WQS
0606_02	Neches River Above Lake Palestine	depressed dissolved oxygen	5c	Evaluation	Planning	TCEQ - SWQM
0606_02	Neches River Above Lake Palestine	pH	4c	WQS Review	Scheduled	TCEQ - WQS
0606A_01	Prairie Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
0606A_03	Prairie Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
0607_01	Pine Island Bayou	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
0607_02	Pine Island Bayou	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS
0607_03	Pine Island Bayou	bacteria	5c	Evaluation	Consulting	TCEQ - WAP
0607_03	Pine Island Bayou	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS
0607_04	Pine Island Bayou	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS
0607A_02	Boggy Creek (unclassified water body)	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS
0607B_01	Little Pine Island Bayou (unclassified water body)	bacteria	5c	Evaluation	Consulting	TCEQ - WAP
0607B_01	Little Pine Island Bayou (unclassified water body)	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS
0607C_01	Willow Creek (unclassified water body)	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS
0608A_01	Beech Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
0608B_04	Big Sandy Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
0608C_01	Cypress Creek (unclassified water body)	bacteria	5b	Evaluation	Underway	TCEQ - WQS
0608C_01	Cypress Creek (unclassified water body)	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS
0608E_01	Mill Creek in Hardin County (unclassified water body)	depressed dissolved oxygen	5c	Evaluation	Underway	TCEQ - SWQM
0611D_01	West Mud Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
0611D_02	West Mud Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
0612_01	Attoyac Bayou	bacteria	5b	WPP, WQS Review	Underway	TSSWCB - SRM
0612_02	Attoyac Bayou	bacteria	5b	WPP, WQS Review	Underway	TSSWCB - SRM
0612_03	Attoyac Bayou	bacteria	5b	WPP, WQS Review	Underway	TSSWCB - SRM
0701_01	Taylor Bayou/North Fork Taylor Bayou Above Tidal	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS
0701_02	Taylor Bayou/North Fork Taylor Bayou Above Tidal	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS
0704_01	Hillebrandt Bayou	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
0704_02	Hillebrandt Bayou	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS
0801C_01	Cotton Bayou (unclassified water body)	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS
0804G_01	Catfish Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
0804G_01	Catfish Creek (unclassified water body)	depressed dissolved oxygen	5b	WQS Review	Planning	TCEQ - WQS
0804H_01	Upper Keechi Creek (unclassified water body)	depressed dissolved oxygen	5b	WQS Review	Planning	TCEQ - WQS
0805_03	Upper Trinity River	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
0805_04	Upper Trinity River	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
0806A_01	Fosdic Lake (unclassified water body)	PCBs in edible tissue	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0806B_01	Echo Lake (unclassified water body)	PCBs in edible tissue	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0806D_01	Marine Creek (unclassified water body)	bacteria	5b	Evaluation	Consulting	TCEQ - WAP
0806E_01	Sycamore Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
0809	Eagle Mountain Reservoir	SI	SI	WPP	Underway	3rd Party
0807_01	Lake Worth	PCBs in edible tissue	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0810_01	West Fork Trinity River Below Bridgeport Reservoir	bacteria	5b	WQS Review, WPP	Underway	TCEQ - WQS
0810A_01	Big Sandy Creek (unclassified water body)	bacteria	5b	WQS Review, WPP	Underway	TCEQ - WQS
0810B_01	Garrett Creek (unclassified water body)	bacteria	5b	WQS Review, WPP	Underway	TCEQ - WQS
0810C_01	Martin Branch (unclassified water body)	bacteria	5b	WQS Review, WPP	Underway	TCEQ - WQS
0810D_01	Salt Creek (unclassified water body)	bacteria	5b	WQS Review, WPP	Underway	TCEQ - WQS
0818_01	Cedar Creek Reservoir	pH	5c	WPP	Underway	3rd Party
0818_02	Cedar Creek Reservoir	pH	5c	WPP	Underway	3rd Party
0818_03	Cedar Creek Reservoir	pH	5c	WPP	Underway	3rd Party
0818_05	Cedar Creek Reservoir	pH	5c	WPP	Underway	3rd Party
0818_06	Cedar Creek Reservoir	pH	5c	WPP	Underway	3rd Party

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
0818_07	Cedar Creek Reservoir	pH	5c	WPP	Underway	3rd Party
0818_08	Cedar Creek Reservoir	pH	5c	WPP	Underway	3rd Party
0818_09	Cedar Creek Reservoir	pH	5c	WPP	Underway	3rd Party
0818_11	Cedar Creek Reservoir	pH	5c	WPP	Underway	3rd Party
0818_12	Cedar Creek Reservoir	pH	5c	WPP	Underway	3rd Party
0823	Hickory Creek – Tributary to 0823	SI	SI	WPP	Underway	TCEQ - NPS
0836B_01	Cedar Creek (unclassified water body)	depressed dissolved oxygen	5b	WQS Review	Planning	TCEQ - WQS
0838C_01	Walnut Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
0841_01	Lower West Fork Trinity River	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - WQS
0841A_01	Mountain Creek Lake (unclassified water body)	chlordane in edible tissue	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0841A_01	Mountain Creek Lake (unclassified water body)	DDD in edible tissue	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0841A_01	Mountain Creek Lake (unclassified water body)	DDE in edible tissue	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0841A_01	Mountain Creek Lake (unclassified water body)	DDT in edible tissue	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0841A_01	Mountain Creek Lake (unclassified water body)	dieldrin in edible tissue	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0841A_01	Mountain Creek Lake (unclassified water body)	heptachlor epoxide in edible tissue	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0841A_01	Mountain Creek Lake (unclassified water body)	PCBs in edible tissue	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
0841B_01	Bear Creek (unclassified water body)	bacteria	5b	TMDL/I-Plan	Underway	TCEQ - TMDL
0841C_01	Arbor Creek (unclassified water body)	bacteria	5b	TMDL/I-Plan	Underway	TCEQ - TMDL
0841E_01	Copart Branch Mountain Creek (unclassified water body)	bacteria	5b	TMDL/I-Plan, WQS Review	Underway	TCEQ - TMDL
0841F_01	Cottonwood Creek (unclassified water body)	bacteria	5b	TMDL/I-Plan, WQS Review	Underway	TCEQ - TMDL
0841G_01	Dalworth Creek (unclassified water body)	bacteria	5b	TMDL/I-Plan, WQS Review	Underway	TCEQ - TMDL
0841H_01	Delaware Creek (unclassified water body)	bacteria	5b	TMDL/I-Plan, WQS Review	Underway	TCEQ - TMDL

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
0841J_01	Estelle Creek (unclassified water body)	bacteria	5b	TMDL/I-Plan, WQS Review	Underway	TCEQ - TMDL
0841L_01	Johnson Creek (unclassified water body)	bacteria	5b	TMDL/I-Plan	Underway	TCEQ - TMDL
0841M_01	Kee Branch (unclassified water body)	bacteria	5b	TMDL/I-Plan	Underway	TCEQ - TMDL
0841R_01	Rush Creek (unclassified water body)	bacteria	5b	TMDL/I-Plan	Underway	TCEQ - TMDL
0841S_01	Vilbig Lakes (unclassified water body)	bacteria	5c	Evaluation	Consulting	TCEQ - WAP
0841T_01	Village Creek (unclassified water body)	bacteria	5b	TMDL/I-Plan	Underway	TCEQ - TMDL
0841U_01	West Irving Creek (unclassified water body)	bacteria	5b	TMDL/I-Plan, WQS Review	Underway	TCEQ - TMDL
0901_01	Cedar Bayou Tidal	bacteria	5c	WPP	Underway	TSSWCB - SRM
0902	Cedar Bayou Above Tidal	SI	SI	WPP	Underway	TSSWCB - SRM
1002_06	Lake Houston	bacteria	5a	TMDL/I-Plan	Planning	TCEQ - TMDL
1003_01	East Fork San Jacinto River	bacteria	5a	TMDL/I-Plan	Planning	TCEQ - TMDL
1003_02	East Fork San Jacinto River	bacteria	5a	TMDL/I-Plan	Planning	TCEQ - TMDL
1003_03	East Fork San Jacinto River	bacteria	5a	TMDL/I-Plan	Planning	TCEQ - TMDL
1004_01	West Fork San Jacinto River	bacteria	5a	TMDL/I-Plan	Planning	TCEQ - TMDL
1004_02	West Fork San Jacinto River	bacteria	5a	TMDL/I-Plan	Planning	TCEQ - TMDL
1004D_01	Crystal Creek (unclassified water body)	bacteria	5a	TMDL/I-Plan	Planning	TCEQ - TMDL
1004E_02	Stewarts Creek (unclassified water body)	bacteria	5a	TMDL/I-Plan	Planning	TCEQ - TMDL
1006D_01	Halls Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1006D_02	Halls Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1006F_01	Big Gulch Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1006H_01	Spring Gully Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1006I_01	Unnamed Tributary of Halls Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1006J_01	Unnamed Tributary of Halls Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007A_01	Canal C-147 Tributary of Sims Bayou Above Tidal (unclassified water body)	bacteria	5c	TMDL/I-Plan	Underway	TCEQ - TMDL
1007B_01	Brays Bayou Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007B_02	Brays Bayou Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007C_01	Keegans Bayou Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007D_01	Sims Bayou Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007D_02	Sims Bayou Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007D_03	Sims Bayou Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007E_01	Willow Waterhole Bayou Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007F_01	Berry Bayou Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
1007G_01	Kuhlman Gully Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007H_01	Pine Gully Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007I_01	Plum Creek Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007K_01	Country Club Bayou Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007L_01	Unnamed Tributary of Brays Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007M_01	Unnamed Tributary of Hunting Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007N_01	Unnamed Tributary of Sims Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007O_01	Unnamed Tributary of Buffalo Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007R_01	Hunting Bayou Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007R_02	Hunting Bayou Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007R_03	Hunting Bayou Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007R_04	Hunting Bayou Above Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007S_01	Poor Farm Ditch (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007T_01	Bintliff Ditch (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007U_01	Mimosa Ditch (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1007V_01	Unnamed Tributary of Hunting Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1008_02	Spring Creek	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1008_03	Spring Creek	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1008_04	Spring Creek	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1008B_01	Upper Panther Branch (unclassified water body)	bacteria	5a	TMDL/I-Plan	Planning	TCEQ - TMDL
1008B_02	Upper Panther Branch (unclassified water body)	bacteria	5a	TMDL/I-Plan	Planning	TCEQ - TMDL
1008C_01	Lower Panther Branch (unclassified water body)	bacteria	5b	TMDL/I-Plan	Planning	TCEQ - TMDL
1008C_02	Lower Panther Branch (unclassified water body)	bacteria	5b	TMDL/I-Plan	Planning	TCEQ - TMDL
1008E_01	Bear Branch (unclassified water body)	bacteria	5b	TMDL/I-Plan	Planning	TCEQ - TMDL
1008H_01	Willow Creek (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1009_01	Cypress Creek	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1009_02	Cypress Creek	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1009_03	Cypress Creek	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1009_04	Cypress Creek	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1009C_01	Faulkey Gully (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1009D_01	Spring Gully (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1009E_01	Little Cypress Creek (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1010_02	Caney Creek	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1010_03	Caney Creek	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1010_04	Caney Creek	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
1011_01	Peach Creek	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1011_02	Peach Creek	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1012	Lake Conroe	SI	SI	WPP	Planning	3rd Party
1013_01	Buffalo Bayou Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1013A_01	Little White Oak Bayou (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1013C_01	Unnamed Non-Tidal Tributary of Buffalo Bayou Tidal (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1014_01	Buffalo Bayou Above Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1014A_01	Bear Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1014B_01	Buffalo Bayou/Barker Reservoir (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1014E_01	Langham Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1014H_01	South Mayde Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1014H_02	South Mayde Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1014K_01	Turkey Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1014K_02	Turkey Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1014L_01	Mason Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1014M_01	Newman Branch (Neimans Bayou) (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1014N_01	Rummel Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1014O_01	Spring Branch (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1015	Lake Creek	SI	SI	WPP	Planning	TSSWCB - SRM
1016_01	Greens Bayou Above Tidal	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1016_02	Greens Bayou Above Tidal	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1016_03	Greens Bayou Above Tidal	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1016A_02	Garners Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1016A_03	Garners Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1016B_01	Unnamed Tributary of Greens Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1016C_01	Unnamed Tributary of Greens Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1016D_01	Unnamed Tributary of Greens Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1017_01	Whiteoak Bayou Above Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1017_02	Whiteoak Bayou Above Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1017_03	Whiteoak Bayou Above Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1017_04	Whiteoak Bayou Above Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1017A_01	Brickhouse Gully/Bayou (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1017B_02	Cole Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1017C_01	Vogel Creek (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
1017D_01	Unnamed Tributary of Whiteoak Bayou (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1017E_01	Unnamed Tributary of White Oak Bayou (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1101_01	Clear Creek Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1101_02	Clear Creek Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1101_03	Clear Creek Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1101_04	Clear Creek Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1101A_01	Magnolia Creek (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1101B_01	Chigger Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1101C_01	Cow Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1101D_01	Robinson Bayou (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1101E_01	Unnamed Tributary of Clear Creek Tidal (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1102_02	Clear Creek Above Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1102_03	Clear Creek Above Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1102_04	Clear Creek Above Tidal	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1102A_01	Cowart Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1102A_02	Cowart Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1102C_01	Hickory Slough (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1102D_01	Turkey Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1102G_01	Unnamed Tributary of Mary's Creek (unclassified water body)	bacteria	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
1103_01	Dickinson Bayou Tidal	bacteria	5a	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL
1103_01	Dickinson Bayou Tidal	depressed dissolved oxygen	5a	WQS Review, WPP	Underway	TCEQ - WQS
1103_02	Dickinson Bayou Tidal	bacteria	5a	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL
1103_02	Dickinson Bayou Tidal	depressed dissolved oxygen	5a	WQS Review, WPP	Underway	TCEQ - WQS
1103_03	Dickinson Bayou Tidal	depressed dissolved oxygen	5a	WQS Review, WPP	Underway	TCEQ - WQS
1103_04	Dickinson Bayou Tidal	bacteria	5a	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL
1103A_01	Bensons Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL
1103B_01	Bordens Gully (unclassified water body)	bacteria	5a	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
1103C_01	Geisler Bayou (unclassified water body)	bacteria	5a	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL
1103C_01	Geisler Bayou (unclassified water body)	depressed dissolved oxygen	5c	WQS Review, WPP	Underway	TCEQ - WQS
1103D_01	Gum Bayou (unclassified water body)	bacteria	5c	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL
1103E_01	Cedar Creek (unclassified water body)	bacteria	5b	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL
1104_01	Dickinson Bayou Above Tidal	depressed dissolved oxygen	5c	Evaluation, WPP	Consulting	TCEQ - WAP
1104_02	Dickinson Bayou Above Tidal	bacteria	5b	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL
1105	Bastrop Bayou Tidal	SI	SI	WPP	Underway	TCEQ - NPS
1105A_01	Flores Bayou (unclassified water body)	bacteria	5b	WPP	Underway	TCEQ - NPS
1105E_01	Brushy Bayou (unclassified water body)	bacteria	5c	WPP	Underway	TCEQ - NPS
1105E_01	Brushy Bayou (unclassified water body)	depressed dissolved oxygen	5c	WPP	Underway	TCEQ - NPS
1107_01	Chocolate Bayou Tidal	bacteria	5c	Evaluation	Consulting	TCEQ - WAP
1113_02	Armand Bayou Tidal	depressed dissolved oxygen	5b	WQS Review, WPP	Underway	TCEQ - WQS
1113_03	Armand Bayou Tidal	depressed dissolved oxygen	5b	WQS Review, WPP	Underway	TCEQ - WQS
1113A_01	Armand Bayou Above Tidal (unclassified water body)	bacteria	5b	WQS Review, WPP	Underway	TCEQ - WQS
1113A_01	Armand Bayou Above Tidal (unclassified water body)	depressed dissolved oxygen	5b	WQS Review, WPP	Underway	TCEQ - WQS
1113B_01	Horsepen Bayou Tidal (unclassified water body)	bacteria	5c	WPP	Planning	3rd Party
1113C_01	Unnamed Tributary to Horsepen Bayou (unclassified water body)	bacteria	5c	WPP	Planning	3rd Party
1113D_01	Willow Springs Bayou (unclassified water body)	bacteria	5c	WPP	Planning	3rd Party
1202H_01	Allen's Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1202K_01	Mill Creek (unclassified water body)	bacteria	5b	Evaluation	Consulting	TCEQ - WAP
1205	Lake Granbury	SI	SI	WPP	Underway	TCEQ - NPS
1208_01	Brazos River Above Possum Kingdom Lake	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1208_02	Brazos River Above Possum Kingdom Lake	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1208_04	Brazos River Above Possum Kingdom Lake	bacteria	5b	WQS Review	Underway	TCEQ - WQS

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
1208_05	Brazos River Above Possum Kingdom Lake	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1209_02	Navasota River Below Lake Limestone	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1209_03	Navasota River Below Lake Limestone	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1209_05	Navasota River Below Lake Limestone	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1209C_01	Carters Creek (unclassified water body)	bacteria	5a	TMDL/I-Plan, WQS Review	Underway	TCEQ - TMDL
1209D_01	Country Club Branch (unclassified water body)	bacteria	5b	TMDL/I-Plan, WQS Review	Underway	TCEQ - TMDL
1209E_01	Wickson Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1209G_01	Cedar Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1209H_01	Duck Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1209H_02	Duck Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1209I_01	Gibbons Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1209J_01	Shepherd Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1209K_02	Steele Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1209L_01	Burton Creek (unclassified water body)	bacteria	5a	TMDL/I-Plan, WQS Review	Underway	TCEQ - TMDL
1210A_01	Navasota River above Lake Mexia (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1211A_02	Davidson Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1212_01	Somerville Lake	depressed dissolved oxygen	5c	Monitoring	Underway	TCEQ - SWQM
1212_01	Somerville Lake	pH	5c	Monitoring	Underway	TCEQ - SWQM
1212_03	Somerville Lake	pH	5c	Monitoring	Underway	TCEQ - SWQM
1212_04	Somerville Lake	pH	5c	Monitoring	Underway	TCEQ - SWQM
1212A_02	Middle Yegua Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
1212B_01	East Yegua Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1213_01	Little River	bacteria	5c	Evaluation	Consulting	TCEQ - WAP
1213_04	Little River	bacteria	5c	Evaluation	Consulting	TCEQ - WAP
1213A_01	Big Elm Creek (unclassified water body)	bacteria	5b	Evaluation	Underway	TCEQ - WQS
1215_01	Lampasas River Below Stillhouse Hollow Lake	bacteria	5b	Evaluation	Consulting	TCEQ - WAP
1216A_01	Trimmier Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
1217	Lampasas River Above Stillhouse Hollow Lake	SI	SI	WPP	Underway	TSSWCB - SRM
1217B_02	Sulphur Creek (unclassified water body)	depressed dissolved oxygen	5c	WPP	Underway	TSSWCB - SRM

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
1217D_01	North Rocky Creek (unclassified water body)	depressed dissolved oxygen	5b	Evaluation, WPP	Reassessment	TCEQ - SWQM
1218_02	Nolan Creek/ South Nolan Creek	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1218C_01	Little Nolan Creek (unclassified water body)	bacteria	5b	Evaluation	Underway	TCEQ - WQS
1221_01	Leon River Below Proctor Lake	bacteria	5b	WPP, WQS Review	Underway	TSSWCB - SRM
1221_04	Leon River Below Proctor Lake	bacteria	5b	WPP, WQS Review	Underway	TSSWCB - SRM
1221_05	Leon River Below Proctor Lake	bacteria	5b	WPP, WQS Review	Underway	TSSWCB - SRM
1221_06	Leon River Below Proctor Lake	bacteria	5b	WPP, WQS Review	Underway	TSSWCB - SRM
1221_07	Leon River Below Proctor Lake	bacteria	5b	WPP, WQS Review	Underway	TSSWCB - SRM
1221A_01	Resley Creek (unclassified water body)	bacteria	5b	WPP, WQS Review	Underway	TSSWCB - SRM
1221A_01	Resley Creek (unclassified water body)	depressed dissolved oxygen	5c	WPP, WQS Review	Underway	TCEQ - WQS
1221A_02	Resley Creek (unclassified water body)	bacteria	5b	WPP, WQS Review	Underway	TSSWCB - SRM
1221B_01	South Leon River (unclassified water body)	bacteria	5b	WPP, WQS Review	Underway	TSSWCB - SRM
1221C	Pecan Creek (unclassified water body)	SI	SI	WPP, WQS Review	Underway	TSSWCB - SRM
1221D_01	Indian Creek (unclassified water body)	bacteria	5b	WPP, WQS Review	Underway	TSSWCB - SRM
1221D_02	Indian Creek (unclassified water body)	bacteria	5b	WPP, WQS Review	Underway	TSSWCB - SRM
1221E	Plum Creek	SI	SI	WPP, WQS Review	Underway	TSSWCB - SRM
1221F_01	Walnut Creek (unclassified water body)	bacteria	5b	WPP, WQS Review	Underway	TSSWCB - SRM
1222A_01	Duncan Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1222B_01	Rush-Copperas Creek (unclassified water body)	bacteria	5c	WQS Review	Planning	TCEQ - WQS
1222E_01	Sweetwater Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1223_01	Leon River Below Leon Reservoir	bacteria	5b	WQS Review	Underway	TCEQ - WQS

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
1223A_01	Armstrong Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1226_02	North Bosque River	excessive algal growth	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1226_03	North Bosque River	excessive algal growth	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1226_04	North Bosque River	excessive algal growth	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1226B_01	Green Creek (unclassified water body)	depressed dissolved oxygen	5c	WQS Review	Underway	TCEQ - SWQM
1226E_01	Indian Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1226F_01	Sims Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1226H_01	Alarm Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
1226K_01	Little Duffau Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1226M_01	Little Green Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WAP
1232A_01	California Creek (unclassified water body)	bacteria	5b	Evaluation	Underway	TCEQ - WQS
1241_01	Double Mountain Fork Brazos River	bacteria	5b	Evaluation	Underway	TCEQ - WQS
1242B_01	Cottonwood Branch (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1242B_02	Cottonwood Branch (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1242C_01	Still Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1242C_02	Still Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1242D_01	Thompsons Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1242D_02	Thompsons Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1242D_02	Thompsons Creek (unclassified water body)	depressed dissolved oxygen	5c	WQS Review	Underway	TCEQ - WQS
1242F_01	Pond Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
1242I_01	Campbells Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TSSWCB - SRM
1242J_01	Deer Creek (unclassified water body)	bacteria	5c	WQS Review	Planning	TCEQ - WQS
1242K_01	Mud Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TSSWCB - SRM
1242L_01	Pin Oak Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TSSWCB - SRM
1242M_01	Spring Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TSSWCB - SRM
1242O_01	Walnut Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TSSWCB - SRM
1242P_01	Big Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1244_03	Brushy Creek	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1244_04	Brushy Creek	bacteria	5b	WQS Review	Underway	TCEQ - WQS

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
1245_01	Upper Oyster Creek	bacteria	4a	TMDL/I-Plan, WQS Review	Underway	TCEQ - TMDL
1245_02	Upper Oyster Creek	bacteria	4a	TMDL/I-Plan, WQS Review	Underway	TCEQ - TMDL
1245_03	Upper Oyster Creek	bacteria	4a	TMDL/I-Plan, WQS Review	Underway	TCEQ - TMDL
1247	Lake Granger	SI	SI	WPP	Underway	TSSWCB - SRM
1247A_01	Willis Creek (unclassified water body)	bacteria	5b	WQS Review, WPP	Underway	TCEQ - WQS
1248_01	San Gabriel/North Fork San Gabriel River	chloride	5b	WQS Review, WPP	Planning	TCEQ - WQS
1248C_01	Mankins Branch (unclassified water body)	bacteria	5b	WQS Review, WPP	Underway	TCEQ - WQS
1249	Lake Georgetown	SI	SI	WPP	Underway	TSSWCB - SRM
1250	South Fork San Gabriel River	SI	SI	WPP	Underway	TSSWCB- SRM
12451	North Fork San Gabriel River	SI	SI	WPP	Underway	TSSWCB - SRM
1255_01	Upper North Bosque River	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1255_01	Upper North Bosque River	excessive algal growth	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1255_02	Upper North Bosque River	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1255_02	Upper North Bosque River	depressed dissolved oxygen	5c	Monitoring	Consulting	TCEQ - WAP
1255_02	Upper North Bosque River	excessive algal growth	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1255A_01	Goose Branch (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1255B_01	North Fork Upper North Bosque River (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1255C_01	Scarborough Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1255D_01	South Fork North Bosque River (unclassified water body)	bacteria	5b	Evaluation	Underway	TCEQ - WQS
1255E_01	Unnamed Tributary of Goose Branch (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1255F_01	Unnamed Tributary of Scarborough Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1255G_01	Woodhollow Branch (unclassified water body)	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1255I_01	Dry Branch (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
1301_01	San Bernard River Tidal	bacteria	5c	WPP	Underway	TCEQ - NPS

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
1302_01	San Bernard River Above Tidal	bacteria	5b	WPP, WQS Review	Underway	TCEQ - NPS
1302_02	San Bernard River Above Tidal	bacteria	5b	WPP, WQS Review	Underway	TCEQ - NPS
1302_03	San Bernard River Above Tidal	bacteria	5b	WPP, WQS Review	Underway	TCEQ - NPS
1302A_01	Gum Tree Branch (unclassified water body)	bacteria	5b	WPP, WQS Review	Underway	TCEQ - NPS
1302B_01	West Bernard Creek (unclassified water body)	depressed dissolved oxygen	5c	WPP	Underway	TCEQ - NPS
1302B_02	West Bernard Creek (unclassified water body)	bacteria	5b	WQS Review, WPP	Underway	TCEQ - NPS
1304_01	Caney Creek Tidal	bacteria	5c	Evaluation	Consulting	TSSWCB - SRM
1304A_01	Linnville Bayou (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
1305_02	Caney Creek Above Tidal	bacteria	5b	WQS Review	Underway	TCEQ - WQS
1305_02	Caney Creek Above Tidal	depressed dissolved oxygen	5b	Evaluation	Reassessment	TCEQ - SWQM
1305_03	Caney Creek Above Tidal	depressed dissolved oxygen	5b	Evaluation	Reassessment	TCEQ - SWQM
1401_01	Colorado River Tidal	bacteria	5c	Evaluation	Planning	TSSWCB - SRM
1402C_01	Buckners Creek (unclassified water body)	depressed dissolved oxygen	5c	WQS Review	Underway	TCEQ - WQS
1402H_01	Skull Creek (unclassified water body)	bacteria	5b	Monitoring	Underway	TCEQ - SWQM
1402H_01	Skull Creek (unclassified water body)	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS
1411_01	E. V. Spence Reservoir	total dissolved solids	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1411_01	E. V. Spence Reservoir	sulfate	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1411_02	E. V. Spence Reservoir	total dissolved solids	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1411_02	E. V. Spence Reservoir	sulfate	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1415_05	North Llano River	SI	SI	WPP	Underway	TSSWCB - SRM
1415_06	South Llano River	SI	SI	WPP	Underway	TSSWCB - SRM
1416_01	San Saba River	bacteria	5c	Monitoring	Underway	TCEQ - CRP

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
1416A_03	Brady Creek (unclassified water body)	depressed dissolved oxygen	5c	WPP	Underway	TCEQ - NPS
1421_07	Concho River	impaired macrobenthic community	5c	WPP	Underway	TSSWCB - SRM
1421_08	Concho River	bacteria	5c	WPP	Underway	TSSWCB - SRM
1421_08	Concho River	depressed dissolved oxygen	5c	WPP	Underway	TSSWCB - SRM
1422	Lake Nasworthy	SI	SI	WPP	Underway	TSSECB – SRM
1423	Twin Buttes Reservoir	SI	SI	WPP	Underway	TSSWCB – SRM
1424	Middle Concho/South Concho River	SI	SI	WPP	Underway	TSSWCB – SRM
1425	O.C. Fisher Lake	SI	SI	WPP	Underway	TSSWCB - SRM
1426_01	Colorado River Below E. V. Spence Reservoir	chloride	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1426_01	Colorado River Below E. V. Spence Reservoir	total dissolved solids	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1426_02	Colorado River Below E. V. Spence Reservoir	chloride	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1426_02	Colorado River Below E. V. Spence Reservoir	total dissolved solids	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1426_03	Colorado River Below E. V. Spence Reservoir	chloride	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1426_03	Colorado River Below E. V. Spence Reservoir	total dissolved solids	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1426_04	Colorado River Below E. V. Spence Reservoir	chloride	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1426_04	Colorado River Below E. V. Spence Reservoir	total dissolved solids	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1428_03	Colorado River Below Town Lake	bacteria	5c	Evaluation	Reassessment	TCEQ - SWQM
1428B_05	Walnut Creek (unclassified water body)	bacteria	5b	Monitoring	Underway	3rd Party
1428C_01	Gilleland Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1431_01	Mid Pecan Bayou	bacteria	5b	WQS Review	Underway	TSSWCB - SRM
1434	Wilbarger Creek -Tributary to 1434 (unclassified water body)	SI	SI	WPP	Planning	TSSWCB - SRM
1501_01	Tres Palacios Creek Tidal	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS
1501_01	Tres Palacios Creek Tidal	bacteria	5c	Evaluation	Consulting	TSSWCB - SRM
1602_02	Lavaca River Above Tidal	bacteria	5c	Evaluation	Underway	TCEQ - WQS
1602_03	Lavaca River Above Tidal	bacteria	5c	Evaluation	Underway	TCEQ - WQS

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
1803A_01	Elm Creek (unclassified water body)	depressed dissolved oxygen	5b	WQS Review	Scheduled	TCEQ - WQS
1803B_01	Sandies Creek (unclassified water body)	bacteria	5c	WQS Review	Planning	TCEQ - WQS
1803B_01	Sandies Creek (unclassified water body)	depressed dissolved oxygen	5b	WQS Review	Scheduled	TCEQ - WQS
1803B_01	Sandies Creek (unclassified water body)	impaired fish community	5b	WQS Review	Scheduled	TCEQ - WQS
1803B_01	Sandies Creek (unclassified water body)	impaired macrobenthic community	5b	WQS Review	Scheduled	TCEQ - WQS
1803B_02	Sandies Creek (unclassified water body)	bacteria	5c	WQS Review	Planning	TCEQ - WQS
1803B_02	Sandies Creek (unclassified water body)	depressed dissolved oxygen	5b	WQS Review	Scheduled	TCEQ - WQS
1803C_01	Peach Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
1803C_01	Peach Creek (unclassified water body)	depressed dissolved oxygen	5c	WQS Review	Planning	TCEQ - WQS
1803C_03	Peach Creek (unclassified water body)	bacteria	5b	WQS Review	Planning	TCEQ - WQS
1803C_03	Peach Creek (unclassified water body)	depressed dissolved oxygen	5c	WQS Review	Planning	TCEQ - WQS
1804A_01	Geronimo Creek (unclassified water body)	bacteria	5c	WPP	Underway	TSSWCB - SRM
1806_04	Guadalupe River Above Canyon Lake	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1806_05	Guadalupe River Above Canyon Lake	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1806_08	Guadalupe River Above Canyon Lake	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1806A_03	Camp Meeting Creek (unclassified water body)	depressed dissolved oxygen	5b	Monitoring	Planning	TCEQ - WAP
1806D_01	Quinlan Creek (unclassified water body)	bacteria	5a	Monitoring	Underway	TCEQ - CRP
1806E_01	Town Creek (unclassified water body)	bacteria	5a	Monitoring	Underway	TCEQ - CRP
1810_01	Plum Creek	bacteria	4b	WPP	Underway	TSSWCB - SRM
1810_02	Plum Creek	bacteria	4b	WPP	Underway	TSSWCB - SRM
1810_03	Plum Creek	bacteria	4b	WPP	Underway	TSSWCB - SRM
1811	Comal River	SI	SI	Monitoring	Underway	TCEQ - CRP
1811A_01	Dry Comal Creek (unclassified water body)	bacteria	5b	Evaluation	Underway	3rd Party
1814_01	Upper San Marcos River	total dissolved solids	5c	Monitoring	Underway	TCEQ - CRP

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
1814_02	Upper San Marcos River	total dissolved solids	5c	Monitoring	Underway	TCEQ - CRP
1814_03	Upper San Marcos River	total dissolved solids	5c	Monitoring	Underway	TCEQ - CRP
1814_04	Upper San Marcos River	total dissolved solids	5c	Monitoring	Underway	TCEQ - CRP
1815	Cypress Creek	SI	SI	WPP	Underway	TCEQ - NPS
1901_01	Lower San Antonio River	bacteria	4a	TMDL/I-Plan	Planning	TCEQ - TMDL
1901_02	Lower San Antonio River	bacteria	4a	TMDL/I-Plan	Planning	TCEQ - TMDL
1901_03	Lower San Antonio River	bacteria	4a	TMDL/I-Plan	Planning	TCEQ - TMDL
1901_04	Lower San Antonio River	bacteria	4a	TMDL/I-Plan	Planning	TCEQ - TMDL
1901_05	Lower San Antonio River	bacteria	4a	TMDL/I-Plan	Planning	TCEQ - TMDL
1902_01	Lower Cibolo Creek	bacteria	5b	WQS Review, WPP	Underway	TCEQ - WQS
1902_02	Lower Cibolo Creek	bacteria	5b	WQS Review, WPP	Underway	TCEQ - WQS
1902_02	Lower Cibolo Creek	impaired fish community	5c	Monitoring, WPP	Underway	TCEQ - CRP
1902_03	Lower Cibolo Creek	bacteria	5b	WQS Review, WPP	Underway	TCEQ - WQS
1908_02	Upper Cibolo Creek	bacteria	5c	WPP	Underway	TCEQ - NPS
1910_02	Salado Creek	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1910_03	Salado Creek	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1910_04	Salado Creek	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1910A_01	Walzem Creek (unclassified water body)	bacteria	4a	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL
1911_02	Upper San Antonio River	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1911_03	Upper San Antonio River	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1911_05	Upper San Antonio River	bacteria	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
1911_07	Upper San Antonio River	bacteria	4a	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL
1911_08	Upper San Antonio River	bacteria	4a	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL
1911_09	Upper San Antonio River	bacteria	4a	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
1911B_01	Apache Creek (unclassified water body)	bacteria	5a	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL
1911C_01	Alazan Creek (unclassified water body)	bacteria	5a	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL
1911D_01	San Pedro Creek (unclassified water body)	bacteria	5a	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL
1911D_02	San Pedro Creek (unclassified water body)	bacteria	5a	TMDL/I-Plan, WPP	Underway	TCEQ - TMDL
2001_01	Mission River Tidal	bacteria	5a	Evaluation	Consulting	TCEQ - TMDL
2003_01	Aransas River Tidal	bacteria	5a	Evaluation	Consulting	TCEQ - TMDL
2004A_01	Aransas Creek (unclassified water body)	bacteria	5b	WQS Review	Underway	TSSWCB - SRM
2102_01	Nueces River Below Lake Corpus Christi	SI	SI	WPP	Underway	3rd Party
2102_02	Nueces River Below Lake Corpus Christi	SI	SI	WPP	Underway	3rd Party
2104_01	Nueces River Above Frio River	impaired fish community	5c	Monitoring	Underway	3rd Party
2104_01	Nueces River Above Frio River	impaired macrobenthic community	5c	Monitoring	Consulting	3rd Party
2107_01	Atascosa River	bacteria	5b	WQS Review	Underway	TCEQ - WQS
2107_02	Atascosa River	bacteria	5b	WQS Review	Underway	TCEQ - WQS
2107_02	Atascosa River	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - TMDL
2107_02	Atascosa River	impaired fish community	5b	WQS Review	Underway	TCEQ - TMDL
2107_02	Atascosa River	impaired macrobenthic community	5b	WQS Review	Underway	TCEQ - TMDL
2107_03	Atascosa River	impaired fish community	5b	WQS Review	Underway	TCEQ - TMDL
2107_03	Atascosa River	impaired macrobenthic community	5b	WQS Review	Underway	TCEQ - TMDL
2108_01	San Miguel Creek	bacteria	5c	WQS Review	Planning	TCEQ - WQS
2109_01	Leona River	bacteria	5c	WQS Review	Underway	TSSWCB - SRM
2109_02	Leona River	bacteria	5c	WQS Review	Underway	TSSWCB - SRM
2109_03	Leona River	bacteria	5c	WQS Review	Underway	TSSWCB - SRM

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
2110_01	Lower Sabinal River	nitrate	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2113_01	Upper Frio River	impaired fish community	5c	Monitoring	Underway	TCEQ - SWQM
2113_01	Upper Frio River	impaired macrobenthic community	5c	Monitoring	Underway	TCEQ - SWQM
2117_02	Frio River Above Choke Canyon Reservoir	bacteria	5c	Evaluation	Consulting	3rd Party
2201_03	Arroyo Colorado Tidal	bacteria	5c	WPP	Planning	TCEQ - NPS
2201_04	Arroyo Colorado Tidal	bacteria	5c	WPP	Planning	TCEQ - NPS
2201_04	Arroyo Colorado Tidal	depressed dissolved oxygen	5a	WPP, WQS Review	Underway	TCEQ - NPS
2201_05	Arroyo Colorado Tidal	bacteria	5c	WPP	Planning	TCEQ - NPS
2201_05	Arroyo Colorado Tidal	depressed dissolved oxygen	5a	WPP, WQS Review	Underway	TCEQ - NPS
2201B_01	Unnamed Drainage Ditch Tributary (B) in Cameron County Drainage District #3 (unclassified water body)	bacteria	5c	Evaluation, WPP	Underway	TCEQ - WQS
2202_01	Arroyo Colorado Above Tidal	bacteria	5b	WQS Review, WPP	Underway	TCEQ - WQS
2202_01	Arroyo Colorado Above Tidal	DDE in edible tissue	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2202_02	Arroyo Colorado Above Tidal	bacteria	5b	WQS Review, WPP	Underway	TCEQ - WQS
2202_02	Arroyo Colorado Above Tidal	DDE in edible tissue	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2202_03	Arroyo Colorado Above Tidal	bacteria	5b	WQS Review, WPP	Underway	TCEQ - WQS
2202_03	Arroyo Colorado Above Tidal	DDE in edible tissue	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2202_04	Arroyo Colorado Above Tidal	bacteria	5b	WQS Review, WPP	Underway	TCEQ - WQS
2202_04	Arroyo Colorado Above Tidal	DDE in edible tissue	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2202A_01	Donna Reservoir (unclassified water body)	PCBs in edible tissue	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2202B_01	Unnamed Drainage Ditch Tributary (B) to S. Arroyo Colorado (unclassified water body)	bacteria	5c	Evaluation, WPP	Underway	TCEQ - WQS

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
2204_01	Petronila Creek Above Tidal	chloride	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2204_01	Petronila Creek Above Tidal	sulfate	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2204_01	Petronila Creek Above Tidal	total dissolved solids	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2204_02	Petronila Creek Above Tidal	chloride	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2204_02	Petronila Creek Above Tidal	sulfate	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2204_02	Petronila Creek Above Tidal	total dissolved solids	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2301	Rio Grande Tidal	SI	SI	WPP	Consulting	TCEQ - WAP
2302	Rio Grande Below Falcon Reservoir	SI	SI	Evaluation	Consulting	3rd Party
2302_01	Rio Grande Below Falcon Reservoir	bacteria	5c	WPP	Underway	TCEQ - WAP
2302_04	Rio Grande Below Falcon Reservoir	bacteria	5c	WPP	Underway	TCEQ - WAP
2302A_01	Arroyo Los Olmos (unclassified water body)	bacteria	5c	WQS Review, WPP	Planning	TCEQ - WQS
2310	Lower Pecos River	SI	SI	WPP	Underway	TSSWCB - SRM
2311_03	Upper Pecos River	depressed dissolved oxygen	5c	WPP, WQS Review	Underway	TSSWCB - SRM
2311_04	Upper Pecos River	depressed dissolved oxygen	5c	WPP, WQS Review	Underway	TSSWCB - SRM
2312	Red Bluff Reservoir	SI	SI	WPP	Underway	TSSWCB - SRM
2314_01	Rio Grande Above International Dam	bacteria	5c	WPP	Underway	3rd Party
2421OW_01	Upper Galveston Bay (Oyster Waters)	bacteria (oyster waters)	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2422B_01	Double Bayou West Fork (unclassified water body)	bacteria	5c	WPP	Underway	TSSWCB - SRM
2422B_01	Double Bayou West Fork (unclassified water body)	depressed dissolved oxygen	5b	WPP, WQS Review	Underway	TSSWCB - SRM
2422D	Double Bayou East Fork (unclassified water body)	SI	SI	WPP	Underway	TSSWCB - SRM
2422OW_01	Trinity Bay (Oyster Waters)	bacteria (oyster waters)	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2423OW_01	East Bay (Oyster Waters)	bacteria (oyster waters)	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2424	Basford Bayou, Tributary to 2424 (unclassified water body)	SI	SI	WPP	Underway	TCEQ-GBEP
2424	Carancahua Bayous, Tributary to 2424 (unclassified water body)	SI	SI	WPP	Underway	TCEQ-GBEP
2424A_02	Highland Bayou (unclassified water body)	bacteria	5c	WPP	Underway	TCEQ-GBEP
2424A_03	Highland Bayou (unclassified water body)	bacteria	5c	WPP	Underway	TCEQ-GBEP

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
2424A_04	Highland Bayou (unclassified water body)	bacteria	5c	WPP	Underway	TCEQ-GBEP
2424A_05	Highland Bayou (unclassified water body)	bacteria	5c	WPP	Underway	TCEQ-GBEP
2424A_05	Highland Bayou (unclassified water body)	depressed dissolved oxygen	5b	WPP, WQS Review	Underway	TCEQ-GBEP
2424C_01	Marchand Bayou (unclassified water body)	bacteria	5a	WPP	Underway	TCEQ-GBEP
2424C_01	Marchand Bayou (unclassified water body)	depressed dissolved oxygen	5c	WPP, WQS Review	Underway	TCEQ-GBEP
2424OW_02	West Bay (Oyster Waters)	bacteria (oyster waters)	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2431A	Moses Bayou (unclassified water body)	SI	SI	WPP	Underway	TCEQ-GBEP
2432OW_01	Chocolate Bay (Oyster Waters)	bacteria (oyster waters)	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2433OW_02	Bastrop Bay/Oyster Lake (Oyster Waters)	bacteria (oyster waters)	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
2434OW_01	Christmas Bay (Oyster Waters)	bacteria (oyster waters)	5a	TMDL/I-Plan	Underway	TCEQ - TMDL
2435OW_01	Drum Bay (Oyster Waters)	bacteria (oyster waters)	4c	TMDL/I-Plan	Underway	TCEQ - TMDL
2439OW_01	Lower Galveston Bay (Oyster Waters)	bacteria (oyster waters)	4a	TMDL/I-Plan	Underway	TCEQ - TMDL
2453A_01	Garcitas Creek Tidal (unclassified water body)	depressed dissolved oxygen	5b	WQS Review	Underway	TCEQ - WQS
2453C_01	Arenosa Creek (unclassified water body)	bacteria	5b	Evaluation	Consulting	TCEQ - WAP
2456_02	Carancahua Bay	bacteria	5c	Evaluation	Consulting	TCEQ - TMDL
2456A_01	West Carancahua Creek Tidal (unclassified water body)	depressed dissolved oxygen	5c	WQS Review	Underway	TCEQ - WQS
2456OW_01	Carancahua Bay (Oyster Waters)	bacteria (oyster waters)	5a	Evaluation	Planning	TCEQ - TMDL
2462OW_01	San Antonio Bay/Hynes Bay/Guadalupe Bay (Oyster Waters)	bacteria (oyster waters)	5a	Evaluation	Planning	TCEQ - TMDL
2472OW_01	Copano Bay/Port Bay/Mission Bay (Oyster Waters)	bacteria (oyster waters)	5a	Evaluation	Consulting	TCEQ - TMDL
2485_03	Oso Bay	bacteria	4a	TMDL/I-Plan	Planning	TCEQ - TMDL
2485A_01	Oso Creek (unclassified water body)	bacteria	5a	Evaluation	Planning	TCEQ - TMDL
2485OW_01	Oso Bay (Oyster Waters)	bacteria (oyster waters)	5a	Evaluation	Planning	TCEQ - TMDL

SEGMENT & AU	SEGMENT NAME	IMPAIRMENT	IR CATEGORY	WAP Strategy	Status	Lead
2491OW_02	Laguna Madre (Oyster Waters)	bacteria (oyster waters)	5a	Evaluation	Planning	TCEQ - TMDL
2492A_01	San Fernando Creek (unclassified water body)	bacteria	5a	Evaluation	Consulting	TCEQ - TMDL
2501_02	Gulf of Mexico	bacteria	5c	Evaluation	Consulting	TCEQ - WAP

Appendix D Groundwater Constituents of Concern Report

Table D.1 Groundwater Constituents of Concern

Major Aquifer	*Region*	*Constituent(s) of Concern*
Carrizo-Wilcox	*South to East Texas*	*Fluoride, Nitrate, Selenium, Chloride, Iron, Manganese, Sulfate, Dissolved Solids, Radioactivity*
Edwards (Balcones Fault Zone)	*Central Texas*	*Arsenic, Fluoride, Nitrate, Selenium, Chloride, Iron, Manganese, Sulfate, Dissolved Solids, Radioactivity*
Edwards Trinity (Plateau)	*Terrell, Reagan, and Crockett Counties*	*Nitrate, Arsenic, Fluoride, Selenium, Chloride, Iron, Manganese, Sulfate, Dissolved Solids, Radioactivity*
Gulf Coast	*Rio Grande Valley*	*Arsenic, Barium, Fluoride, Nitrate, Selenium, Chloride, Iron, Manganese, Sulfate, Dissolved Solids, Radioactivity*
Hueco – Mesilla Bolson	*Far West Texas*	*Arsenic, Fluoride, Nitrate, Chloride, Manganese, Sulfate, Dissolved Solids*
Ogallala	*Southern High Plains, Panhandle*	*Nitrate, Arsenic, Barium, Chromium, Fluoride, Selenium, Chloride, Iron, Manganese, Sulfate, Dissolved Solids, Radioactivity*
Pecos Valley (formerly called the Cenozoic Pecos Alluvium)	*West Texas*	*Arsenic, Fluoride, Nitrate, Selenium, Chloride, Iron, Manganese, Sulfate, Dissolved Solids*
Seymour	*North Central*	*Nitrate, Arsenic, Selenium, Chloride, Fluoride, Iron, Manganese, Sulfate, Dissolved Solids*
Trinity	*Central Texas North - Outcrop Area Only*	*Nitrate, Arsenic, Fluoride, Selenium, Chloride, Iron, Manganese, Sulfate, Dissolved Solids, Radioactivity*
Minor Aquifer	*Region*	*Constituent(s) of Concern*
Blaine	*North Central*	*Nitrate, Chloride, Iron, Sulfate, Dissolved Solids, Arsenic, Manganese, Selenium*
Blossom	*Northeast Texas*	*Nitrate, Chloride, Iron, Manganese, Sulfate, Dissolved Solids*
Bone Spring-Victorio Peak	*Far West Texas*	*Nitrate, Chloride, Fluoride, Sulfate, Dissolved Solids, Zinc*
Brazos River Alluvium	*Southeast Texas*	*Nitrate, Chloride, Iron, Manganese, Sulfate, Dissolved Solids*
Capitan Reef	*West Texas*	*Nitrate, Chloride, Fluoride, Iron, Manganese, Sulfate, Dissolved Solids*
Minor Aquifer	*Region*	*Constituent(s) of Concern*

Dockum	*Panhandle, West Texas - Outcrop Area Only*	*Arsenic, Nitrate, Selenium, Chloride, Fluoride, Iron, Manganese, Sulfate, Dissolved Solids, Radioactivity*
Edwards-Trinity (High Plains)	*Southern High Plains*	*Nitrate, Arsenic, Fluoride, Chloride, Sulfate, Dissolved Solids*
Ellenburger – San Saba	*Central Texas*	*Fluoride, Nitrate, Selenium, Chloride, Iron, Manganese, Sulfate, Dissolved Solids, Radioactivity*
Hickory	*Llano Uplift*	*Arsenic, Fluoride, Nitrate, Chloride, Iron, Manganese, Sulfate, Dissolved Solids, Radioactivity*
Igneous	*Far West Texas*	*Arsenic, Fluoride, Nitrate, Chloride, Iron, Manganese, Sulfate, Dissolved Solids, Radioactivity*
Lipan	*Concho, Runnels, Tom Green, and Coke Counties*	*Nitrate, Selenium, Chloride, Sulfate, Dissolved Solids*
Marathon	*Brewster County*	*Nitrate*
Marble Falls	*Central Texas/Llano Uplift*	*Not Applicable*
Nacatoch	*Northeast Texas*	*Chloride, Fluoride, Iron, Manganese, Sulfate, Dissolved Solids*
Queen City	*Texas Coastal Plain*	*Nitrate, Chloride, Copper, Fluoride, Iron, Manganese, Sulfate, Dissolved Solids, Zinc*
Rita Blanca Aquifer	*Far West Texas*	*Arsenic, Nitrate, Iron, Manganese*
Rustler	*Culberson, Reeves Counties*	*Nitrate, Chloride, Fluoride, Iron, Sulfate, Dissolved Solids*
Sparta	*Texas Coastal Plain*	*Arsenic, Selenium, Chloride, Fluoride, Iron, Manganese, Sulfate, Dissolved Solids*
West Texas Bolsons	*Far West Texas*	*Arsenic, Fluoride, Nitrate, Chloride, Iron, Manganese, Sulfate, Dissolved Solids, Radioactivity*
Woodbine	*North Central Texas*	*Fluoride, Chloride, Iron, Manganese, Sulfate, Dissolved Solids*
Yegua Jackson	*Texas Coastal Plain*	*Arsenic, Nitrate, Selenium, Chloride, Fluoride, Iron, Manganese, Sulfate, Dissolved Solids, Radioactivity*

* This table is based on the 2008 TWQI.
** Radioactivity is based on Gross Alpha

Table D.2 Aquifer Vulnerability Ranking

Major Aquifers	***Average Drastic Index***	***Vulnerability Rank****
Seymour	*144*	*High*
Edwards (Balcones Fault Zone - San Antonio)	*135*	*High*
Edwards (Balcones Fault Zone - Austin)	*126*	*High*
Carrizo-Wilcox	*117*	*Medium*
Edwards-Trinity (Plateau)	*107*	*Medium*
Ogallala (South)	*99*	*Medium*
Gulf Coast	*95*	*Medium*
Trinity	*95*	*Medium*
Pecos Valley, formerly Cenozoic Pecos Alluvium	*95*	*Medium*
Ogallala (North)	*87*	*Low*
Hueco-Mesilla Bolson	*84*	*Low*
Minor Aquifers	***Average Drastic Index***	***Vulnerability Rank****
Brazos River Alluvium	*144*	*High*
Ellenberger-San Saba	*126*	*High*
Marble Falls	*126*	*High*
Hickory	*114*	*Medium*
Nacatoch	*111*	*Medium*
Blossom	*109*	*Medium*
Queen City	*108*	*Medium*
Lipan	*108*	*Medium*
Rustler	*106*	*Medium*
Blaine	*102*	*Medium*
Bone Springs-Victorio Peak	*100*	*Medium*
Capitan Reef Complex	*98*	*Medium*
Sparta	*98*	*Medium*
Marathon	*96*	*Medium*
West Texas Bolsons	*90*	*Low*
Edwards-Trinity (High Plains)	*83*	*Low*
Rita Blanca	*83*	*Low*
Woodbine	*82*	*Low*
Igneous	*79*	*Low*
Dockum	*78*	*Low*
Yegua-Jackson	*Not Available*	*Not Available*

Appendix E NPS Program Milestones

Table E.1 NPS Program Milestones Schedule[1]

Goals / Objectives	Milestone	Milestone Description	Milestone Measurement	Program Year					
				2012	2013	2014	2015	2016	2017
ST1/A	NPS Assessment Report	The state will produce the IR in accordance with applicable EPA guidance	IR	1	0	1	0	1	0
LT/2	NPS Management Program Updates	The state will update the Management Program in accordance with applicable EPA guidance	Management Program updates	0	0	0	0	0	1
LT/7	NPS Annual Report	The state will produce the NPS Annual Report in accordance with applicable EPA guidance	NPS Annual Report	1	1	1	1	1	1
LT/2-5	Section 319(h) Grant Program Solicitation	The state will conduct individual TCEQ and TSSWCB solicitations for Section 319(h) grant funding	Grant Solicitation documentation	2	2	2	2	2	2
LT/2-5	Section 319(h) Grant Program Application	The state will prepare individual TCEQ and TSSWCB grant program applications and submit them to EPA for Section 319(h) grant funding	Grant Application documentation	2	2	2	2	2	2

Goals / Objectives	Milestone	Milestone Description	Milestone Measurement	Program Year					
				2012	2013	2014	2015	2016	2017
LT/2	Section 319(h) Grant Program Reporting	The state will report grant funded activities to the Grants Reporting and Tracking System in accordance with EPA guidance	GRTS updates	4	4	4	4	4	4
ST2/A	Priority Watersheds Report Updates	The state will update the Priority Watersheds Report based upon information and recommendations derived through the Watershed Action Planning process as described in the Management Program	Priority Watersheds Report Updates	0	1	0	1	0	1
ST3/C,D	Watershed Training	The state will provide training to watershed professionals to ensure quality and consistency in the development and implementation of watershed protection efforts	Texas Watershed Planning Short Course	1	1	1	1	1	1
ST3/A,B,F,G	Watershed Education	The state will provide watershed education to help citizens participate in programs designed to address water quality issues	Texas Watershed Steward Program (number of workshops)	10	10	10	10	10	10

Goals / Objectives	Milestone	Milestone Description	Milestone Measurement	Program Year					
				2012	2013	2014	2015	2016	2017
ST3/C,D	Watershed Training	The state will provide a forum to facilitate the transfer of information between watershed professionals in the state	Texas Watershed Coordinator Roundtable	2	2	2	2	2	2
ST3/B,F,G	Volunteer Monitoring	The state will provide support for local volunteer monitoring groups. These groups provide water quality data to the state water quality planning program and gain insight into resolving water quality issues	Texas Stream Team Participation (numbers of stations monitored)	250	250	250	250	250	250
ST3/C,F,G	Urban BMPs	The state will provide technical and financial assistance to local communities to support the implementation of urban BMPs	Coastal Urban BMP Guidance Manual	0	0	0	1	0	0
ST1/B	Quality Assurance	The state will ensure that monitoring procedures are in compliance with EPA-approved TCEQ and TSSWCB Quality Management Plans	Annual Quality Management Plan updates	2	2	2	2	2	2

Goals / Objectives	Milestone	Milestone Description	Milestone Measurement	Program Year					
				2012	2013	2014	2015	2016	2017
ST1/C	Watershed Characterization	The state will support the implementation of projects designed to evaluate watershed characteristics and produce the information needed for watershed and water quality models	Watershed characterization projects	9	4	1	1	0	0
ST2/A,C	Watershed Coordination	The state will support watershed coordination projects which facilitate the implementation of WPPs	Watershed coordination projects	15	12	9	6	1	0
ST1/D	Develop WPPs	The state will support projects which provide for the development of WPPs which satisfy applicable EPA guidance	WPP development projects	16	9	7	5	2	0
ST2/D	Implement WPPs	The state will support projects which provide for the implementation of management measures specified in WPPs which satisfy applicable EPA guidance	WPP implementation projects	25	19	14	9	2	0

Goals / Objectives	Milestone	Milestone Description	Milestone Measurement	Program Year					
				2012	2013	2014	2015	2016	2017
ST1/D	Develop TMDLs and I-Plans	The state will support projects which provide for the development of TMDLs and I-Plans which satisfy applicable state, federal, and program regulations and guidance	TMDL and I-Plan development projects	1	0	0	0	0	0
ST2/D	Implement TMDLs and I-Plans	The state will support projects which provide for the implementation of management measures specified in TMDLs and I-Plans which satisfy applicable state, federal, and program regulations and guidance	TMDL I-Plan implementation projects	9	8	6	5	1	0
ST2/B,C	Load Reductions	The state will support projects which provide for the reduction of loadings of NPS pollutants	NPS load reduction projects	29	22	15	12	4	0
ST2/B,C	Load Reductions (Nitrogen)	The state will ensure project reductions are reported utilizing GRTS	GRTS Report	RQ(2)	RQ	RQ	RQ	RQ	RQ
ST2/B,C	Load Reductions (Phosphorus)	The state will ensure project reductions are reported utilizing GRTS	GRTS Report	RQ	RQ	RQ	RQ	RQ	RQ
ST2/B,C	Load Reductions (Sediment)	The state will ensure project reductions are reported utilizing GRTS	GRTS Report	RQ	RQ	RQ	RQ	RQ	RQ

Goals / Objectives	Milestone	Milestone Description	Milestone Measurement	Program Year					
				2012	2013	2014	2015	2016	2017
ST2/E	Effectiveness Monitoring	The state will support projects which provide for the collection and analysis of water quality and other watershed information for the purpose of evaluating the effectiveness of BMPs	Effectiveness monitoring projects	31	25	17	11	3	0

(1) Milestones are estimated based upon existing grant commitments (up to and including FY2011 CWA § 319(h) grant commitments between EPA, the State, and collaborating entities).

(2) RQ – Reportable Quantity – the value will be reported in the NPS Annual Report.

Appendix F Summary of Public Comments and the State's Responses

Nine (9) comment letters representing 13 persons and organizations were received in response to the published draft of the Management Program. Most of the comments provided updates and clarifications of general information used in the document, programmatic matters, and editorial changes. Other comments received addressed state policy issues.

Table F.1 Responses to Public Comments

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
1-1	2/08/2012	Nueces River Authority	Pg 60, Basin Steering Committees, 2nd paragraph: The first sentence states that the all CRP steering committees meet annually. NRA hosts a basin-wide meeting every other year.	The document text was revised to clarify the frequency of CRP steering committee meetings.
1-2			Pg 60 and throughout the document, perhaps the CRP Planning Agencies should be referred to as the Partner Agencies. Sometimes it's capitalized, sometimes it not.	The document text was revised to use a consistent reference to CRP Partner Agencies.
1-3			Pg 72 - 73; MS4 is used in the first sentence of last paragraph on pg 72, then defined later in the paragraph.	The document text was revised to properly define the acronym.
1-4			Pg 74 - Watershed Protection Plans, 3rd paragraph - WPP should be plural.	The document text was revised to eliminate the typographical error.
1-5			Pg 86 -Beginning with 'State Agencies' - need an introductory sentence. Need distinction between the headings for the agencies and the programs. It was hard to keep track. Ditto for 'Federal Agencies', etc.	The document text was revised to an introductory sentence as recommended.
1-6			When possible, keep headings with the text (example pg 46-47) and keep tables on one page.	The document text was revised to enhance the document formatting.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
2-1	3/15/2012	Texas Water Resources Institute	Page 42: "Local Watershed Prioritization" paragraph. TCEQ and TSSWCB should provide a list of public participation meetings.	Local watershed prioritization meetings held in each river basin are advertised by water quality planning program areas, thereby providing notice to the public. No changes were made to the document as a result of this comment.
2-2			Page 44: Table 3.1. Landowners should be included in the list of examples in all rows except the last one.	The document text was revised to highlight the role of landowners in the watershed planning process.
2-3			Page 45: Table 3.2. Ensure that this table includes ALL opportunities for stakeholder participation. There has been conflicting information on which meeting the WAP discussion will actually take place in. The link to agency websites that identifies individual meetings should be included here as well.	As stated in the document text, the table only presents examples of public participation meetings held under the state's water quality planning program, not the WAP participation mechanisms. Listing specific meetings provided by program areas will be considered during future development of the WAP process.
2-4			Page 47: 1st paragraph, 2nd sentence This sentence references "this report," is "this report" referring to Appendix C or to the NPS report? These statements should be clarified such that their meaning/intent is clear.	The document text was revised to clarify the reports referenced in the paragraph.
2-5			Page 47: 1st paragraph, 6th sentence This sentence indicates that the Priority Waters report offers TCEQ applicants the basis to plan. Does this report not also provide the same info to TSSWCB applicants? Please clarify.	The document text was revised to state that the information can be useful to all Section 319 grant applicants.
2-6			Page 47: Figure 3.1. While we realize that most of this figure is indicative of Agency tasks, it should be clarified to show which tasks are Agency tasks and which are applicant tasks.	The figure is intended to illustrate the overall process, not to define specific tasks. No changes were made to the document in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
2-7			Page 47: 2nd paragraph The intent of this sentence is not clear. The way it is worded, it implies that funding priorities will be set in the individual Request For Proposals. While we feel that is what the Agencies intend this statement to say, it should be clarified that these funding priorities are a subset of outcomes of the WAP process.	The document text was revised to clarify the role of WAP in the prioritization of funding in the §319 grant program.
2-8			Page 48: 1st paragraph Are the "assessments and planning meetings" and "update to the priority watersheds report" Agency only meetings?	No. Assessment and planning meetings and updates to the Priority Watersheds Report are a coordinated effort between the TCEQ, TSSWCB, River Authorities, and other interested parties. No changes to the document were made in response to this comment.
2-9			The WAP graphic that TCEQ has shown at multiple meetings should be included. The graphic in mind has a similar look to Figure 3.1, but illustrates the WAP process. This should be inserted somewhere in the page 41 to 42 area.	The requested WAP graphic is already included in the document as Figure 1.2 WAP Process. The document language in Chapter 3 has been revised to reference back to Figure 1.2 in Chapter 1
2-10			Overall, the clarity of the WAP process leaves much to be desired. The intent of some portions of this chapter is not clear. That said, we do realize that the WAP process is still being fleshed out and that some of the specifics are not clear to the agency; however, this NPS program description will be valid for 5 years. That being the case, ensuring that the WAP process is described as clear as possible is imperative.	The document language has been revised to provide more clarity about the WAP process based on other comments. Additional clarification can be considered in future program development opportunities. No changes to the document were made in response to this specific comment.
2-11			The commenter presents revised descriptions of the TWRI programs and services.	The document text was revised to include the revised program descriptions recommended in the comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
2-12			Appendix E Comments: Row 2 illustrates the NPS Management Program Update schedule. Should an update be included for Program Year 2012?	The milestones in Appendix E represent commitments post-publication of this current revision. No changes to the document were made in response to this comment.
2-13			Appendix E Comments: Row 4 regards the TX Watershed Planning Short Course. Given recent drops in attendance is it pertinent to plan for 1 event per year? If Attendance declines continue and the project team decides that less than annual courses are appropriate, how much heartache would be caused by having this table indicate that 1 event per year will be held?	As described in Chapter 4, the Watershed Planning Short Course is a fundamental component of the Statewide Educational Program necessary for successful watershed planning and implementation The goal of the program is to conduct 1 Watershed Planning Short Course per year. Allowances can be made if lack of attendance requires the cancellation of a course. No changes to the document were made in response to this comment.
2-14			Appendix E Comments: Beginning with row 3 on page 230 and continuing through the end of the document, the decline in the number of milestones listed per program year is troubling. Does this decline in projected milestones mean that funding to support NPS program efforts is going away? Or is this more a function of the state's inability to accurately predict what number of milestones will be accomplished each year? If the latter is true, perhaps populating this table TBD rather than a declining number of milestones will be more appropriate.	Milestones are estimated based upon existing grant commitments at the time of publication (up to and including FY2011 CWA §319(h) grant commitments between EPA, the State, and collaborating entities). As the Commenter observes, the State is not able to predict specifically what new scopes of work will be approved in the future, thereby making predictions of future milestones problematic. Estimates and milestones in Appendix E will be revised as new grant commitments are executed. A footnote was added in Appendix E to clarify.
3-1	3/12/2012	Railroad Commission of Texas	NPS Pollution, page 13. Commenter recommends chlorides and/or total dissolved solids be added to the list of common NPS pollutants.	The document text was revised to include the pollutants recommended by the commenter.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
3-2			Voluntary Cleanup Program, page 114. Commenter recommends that the RRC's voluntary cleanup program also be presented.	This section of the document is intended to present TCEQ programs. The RRC voluntary cleanup program is identified in the description of RRC programs on page 140 of the document. No change to the document was made in response to this comment.
3-3			Railroad Commission of Texas, page 140. Commenter recommends deletion of RRC railroad-related functions.	The document text was revised to delete references to railroad-related functions as recommended.
3-4			Railroad Commission of Texas, page 140. Commenter recommends RRC's jurisdiction be clarified regarding the exploration and production activities of the oil and natural gas industry.	The document text was revised to clarify RRC jurisdictions as recommended.
3-5			Railroad Commission of Texas, page 140. Commenter recommends inclusion of a description of the RRC brownfields program.	The document text was revised to include a description of the RRC brownfields program as recommended.
3-6			Oil and Gas Management, page 141. Commenter recommends the Oil and Gas Regulation and Cleanup fund be substituted for the Oil Field Cleanup Fund.	The document text was revised to use the correct fund name as recommended.
3-7			Oil and Gas Management, page 141. Commenter recommends the names of several RRC program areas be updated.	The document text was revised to update the names of RRC programs as recommended.
3-8			Oil and Gas Management, page 141. Commenter recommends the functions of the Environmental Services program be clarified.	The document text was revised to clarify the program functions as recommended.
3-9			Oil and Gas Waste Minimization, page 142. Commenter recommends the functions of the Groundwater Advisory Unit be clarified.	The document text was revised to clarify the program functions as recommended.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
3-10			Oil and Gas Well Plugging Program, page 142. Commenter recommends the number of wells plugged under the RRC program be updated.	The document text was revised to update the number of wells plugged under the RRC program as recommended.
3-11			Oil and Gas Well Plugging Program, page 143. Commenter recommends the use of CWA §319(h) by the RRC be clarified.	The document text was revised to clarify the use of §319(h) grant funds as recommended.
3-12			Categories of Nonpoint Source Pollution Management, page 165. Commenter recommends inclusion of the abatement of contaminated groundwater as an example of a general category of BMPs.	The document text was revised to include the general category of BMPs as recommended.
3-13			Table 6-1 BMPs by Category, page 166. Commenter recommends inclusion of oil and gas-related BMPs in the list of BMP examples.	The document text was revised to include the BMPs examples as recommended.
3-14			Table 6-2 BMPs by Source, page 172. Commenter recommends inclusion of oil and gas-related BMPs in the list of BMP examples for oil and gas-related activities.	The document text was revised to include the BMP examples as recommended.
3-15			Texas Railroad Commission, page 176. Commenter recommends consistent use of the agency name and acronym.	The document text was revised to be more consistent in the use of the agency name and acronym as recommended.
3-16			Texas Railroad Commission, page 176. Commenter recommends text be revised to clarify the primary responsibility of the RRC.	The document text was revised to clarify the primary responsibility of the RRC.
3-17			Texas Railroad Commission, page 176. Commenter recommends inclusion of additional citations pertaining to the RRC responsibilities.	The document text was revised to include additional citations pertaining to the RRC responsibilities as recommended.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
4-1	3/12/2012	Lower Rio Grande Valley Storm Water Task Force	The commenter recommends the TCEQ continue to provide assistance in the region, funding for LID practices in the region be a priority, and funding for research into LID a priority for the region.	As described in Chapter 4, LID is a fundamental component of the Statewide Educational Program (Urban BMP Initiative) necessary for successful watershed planning and implementation Funding decisions in the TCEQ §319 grant program are guided by the criteria established in each RFGA. No changes to the document were made in response to this comment.
4.2			The commenter recommends the TCEQ consider the development of a WPP for the Laguna Madre.	The recommendation to develop a WPP for the Laguna Madre should be referred to the WAP process for potential inclusion in the WAP Strategy Table. No changes to the document were made in response to this comment.
5-1	3/12/2012	Citizen – Matt Berg	p. 22 The commenter recommends the document emphasize stakeholder participation throughout the development and implementation of WPPs.	The document text was revised to state that sustained participation by stakeholders is an important element in successful watershed planning.
5-2			p. 28 The commenter expresses concern regarding the description of the development of I-Plans for TMDLs.	The document text was revised to clarify the I-Plan development process with regards to water quality impairments. Reference to "extent practicable" was retained to allow the flexibility and adaptive management needed to facilitate stakeholder participation.
5-3			p. 39 The commenter recommends additional language be used to characterize stakeholder participation.	The document text was revised to clarify the role of stakeholders in the watershed planning process.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
5-4			p. 41 The commenter expresses concern about the water quality standards being "attainable."	TCEQ agrees that the use of "attainable" could be confusing to the reader, however it has a clear and statutory definition in the standards (TAC §307.3 Definitions and Abbreviations), which is as follows: "Attainable Use – A use that can be reasonably achieved by a water body in accordance with its physical, biological, and chemical characteristics whether it is currently meeting that use or not. Guidelines for the determination and review of attainable uses are provided in the standards implementation procedures. The designated use, existing use, or presumed use of a water body may not necessarily be the attainable use". No change to the document was made in response to this comment.
5-5			p. 51 The commenter expresses concern about the possibilities that Uses may be judged to be not attainable.	The statement that a use may not be attainable is correct. The TCEQ has guidelines for addressing water bodies that are not attaining their uses through the completion of a UAA. UAAs are intended to address situations where the existing, designated and/or presumed use may not be appropriate. The document text was revised to clarify the description of "Uses".

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
5-6			p. 52 The commenter expresses concern that "recreational uses" should be determined based on science, not based on existing regulations.	The most appropriate contact recreation category is determined by completion of Recreational UAAs. These scientific studies evaluate and document physical stream characteristics and types of recreation that occur on a water body. An RUAA survey must be completed in order for TCEQ to determine which sub-category best describes the local conditions of the water body. The practice of establishing sub-categories of a use and describing circumstances when this practice is allowable by EPA is documented in 40 CFR §131.10 - Designation of Uses. One of the allowable circumstances is when "human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied". No change to the document was made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
5-7			p. 56 The commenter expresses concern about the explanation of "UAAs."	UAAs are often associated with permit actions to confirm the appropriateness of a presumed use on an unclassified stream, or the designated use of a classified segment. For example, receiving water assessments are typically performed on unclassified streams when an application for a permit is received by TCEQ. These studies document the naturally-occurring aquatic life outside of the influence of any existing dischargers and ensure the discharged effluent does not negatively-impact the existing use. Aquatic life UAAs are performed on water bodies when the results of the receiving water assessment indicate the existing use might be lower (less stringent) than the presumed use. The UAA is a more extensive study that collects additional information in order to confirm the presumed use or better identify the most appropriate use if different from the presumed use. No change to the document was made in response to this comment.
5-8			p. 70 The commenter identified a typographical error.	The document text was revised to eliminate the typographical error.
5-9			The commenter recommends additional explanation of USEPA's process for utilizing WPPs in lieu of TMDLs (also know as the 4b process). The commenter notes that this should be a very open and transparent process with clear expectations upfront and clear guidelines and timetables if "other pollution control requirements" do not result in water quality restoration.	The document has been revised to include additional explanation of USEPA's process for utilizing WPPs in lieu of TMDLs.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
6-1	3/06/2012	Texas Department of Transportation	The commenter recommends document text in Chapter 5 pertaining to the description of TxDOT programs be revised by deleting language in the draft document.	The document text was revised to clarify the description of TxDOT programs by deleting the language as recommended.
7-1	3/12/2012	U.S. Environmental Protection Agency Region 6	The commenter notes that USEPA-R6 granted an extension for submittal of the revised Management Program to be submitted to USEPA-R6 no later than July 1, 2012. The commenter appreciates the State's diligence and effort in developing the revised document and adhering to the agreed-upon timeline.	The State is on schedule to submit this 2012 revision to USEPA-R6 by July 2012. No changes to the document were made in response to this comment.
7-2			The commenter recalls that in April 2010, USEPA-R6 provided recommendations for the State's consideration in developing the 2012 revision. These recommendations focused on the alignment of the Management Program with the NPS Program Annual Report, coordination between implementing agencies, and watershed prioritization. Additional comments were provided during 2011 focusing on consistency of information within the document, watershed prioritization, coordination, as well as measurable administrative and environmental milestones.	Informal comments received from USEPA-R6 in 2010 and 2011 were addressed during the development of the Management Program document. These informal comments were addressed by the incorporation of the WAP process and subsequent watershed priorities as detailed in Appendix C, in addition to the inclusion of administrative and environmental milestones in Appendix E. No changes to the document were made in response to this comment.
7-3			The commenter supports revisions and improvements contained in this draft of the Management Program, many of which stem from the WAP process. The coordination with stakeholders at the watershed, regional, and state levels that results in the WAP Strategy Table allows for greater transparency into the State's efforts to protect and restore individual water bodies.	The State concurs with the commenter in that WAP will 1) engage stakeholders more fully in determining strategies that restore water quality, 2) increase transparency of state agencies' water quality decision-making, and 3) improve accountability of state agencies' commitments to improve water quality. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
7-4			The commenter supports new milestones described in the Management Program, which are associated with each long- and short-term goal and objective. Milestones will allow for the tracking and performance of program efforts and provide a basis for evaluation of program implementation.	The State concurs with the commenter in that milestones detailed in Appendix E of the Management Program will facilitate tracking, reporting, and evaluating program efforts. No changes to the document were made in response to this comment.
7-5			The commenter supports the addition of environmental milestones, specifically statewide load reduction targets for nitrogen, phosphorus, and sediment. While the current draft includes load reduction milestones for each of these parameters, the document indicates that reductions will simply be reported utilizing USEPA's GRTS. In previously submitted informal comments, the commenter recommended that quantitative load reduction targets for the overall program (not just CWA §319(h)-funded projects) be provided. The commenter does not support the load reduction milestones as documented in this version of the Management Program document, as they do not represent quantitative targets that could be used to track or assess program performance.	The difficulties associated with developing such predictive quantitative milestones are significant. For the State to make commitments for anticipated pollutant load reductions associated with future BMP implementation, the State must have a scientifically credible and defensible methodology for establishing such milestones. As noted in Chapter 2 of the Management Program under the description of "Statewide Program Milestones", the State and USEPA recognize that changes to the milestones can be influenced by on-going revisions to national USEPA guidance. Over the next two years, the State will evaluate a variety of methods to predict future load reductions targets, and then depending on changes to national USEPA guidance will re-consider the inclusion of predictive quantitative milestones in Appendix E. Additionally, the inclusion of "reportable quantity" milestones in Appendix E is consistent with USEPA's approach to tracking and reporting pollutant load reductions to satisfy their strategic plan and performance measures. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
8-1	3/12/2012	San Antonio River Authority	The commenter recommends that the UAA tool section of the report be revised to indicate UAAs are locally driven processes, the TCEQ should proactively engage river and watershed statutorily responsible water quality management entities, and the TPWD should be an equal partner in the process.	The TCEQ acknowledges the San Antonio River Authority's (SARA) comments regarding UAAs. The TCEQ has considered feedback provided by SARA during the RUAA process and changed the RUAA process accordingly, highlighting the need and role local stakeholders play in the development and implementation of RUAAs. These changes include: 1) Soliciting feedback from local stakeholders prior to the initiation of a study, to determine if an RUAA is an appropriate water quality management approach to a water body identified on the §303(d) List for bacteria. These stakeholders include water quality management personnel from the following entities: River Authorities, TPWD, TCEQ Region, and TSSWCB. 2) Notifying River Authorities prior to the release of a draft RUAA report for public comment on the TCEQ website. The purpose of this comment period is to solicit additional information from the public on the type of recreational activities occurring on the water body, as well as physical characteristics of the stream, before the report is considered final. The document text was revised to clarify the description of the UAA process.
8-2			The commenter recommends removing references to older management practices (riprap, gabions, and armoring) and adding several new management practices (vegetative filter strips, rain gardens, trash interceptors/separators, tree boxes, riparian buffers, and connecting streams or channels for floodplain) to the lists in Chapter 6.	The document text was revised to include the new management practices as recommended. The document was not revised to remove management practices as recommended because these practices are still in use.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-1	3/12/2012	Richard Lowerre on behalf of Caddo Lake Institute, Lone Star Chapter of the Sierra Club, Clean Water Action, Neches River Watershed Sentinels, and an individual commenter (CLI, et al.)	The commenter noted that the Management Program fails to comply with the recommendations made by the Texas Sunset Advisory Commission, as adopted by the Legislature, to improve transparency and accountability in the operation of TSSWCB programs.	The correlation between the recommendations made by the Texas Sunset Advisory Commission and the commenter's concerns on this Management Program and the federally-funded CWA §319(h) NPS Grant Program mischaracterizes the Sunset Commission's recommendations which are exclusively focused on the TSSWCB's two primary state-funded cost-share programs. In fact, the Sunset Commission heralded the accountability and transparency of the TSSWCB's NPS Grant Program as a model which other agency programs should emulate. The Sunset Commission concluded that the "State Board's own NPS Grant Program... [has] developed ways to ensure grants are accountable and effective." (Final Report, July 2011, Issue 1, pg 11, *http://www.sunset.state.tx.us/82ndreports/swcb/swcb fr.pdf*). No changes to the document were made in response to this comment.
9-2			The commenter expressed concern that the inability of the State to demonstrate effective and efficient use of federal and state funds may put future funding at risk.	TCEQ and TSSWCB share the commenter's concern regarding future funding levels. To date, both agencies have been able to demonstrate to USEPA-R6 continued satisfactory progress to implement the Management Program, thereby allowing USEPA-R6 to annually award CWA §319(h) grant monies to the State. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-3			The commenter summarizes that the Management Program is deficient, given the requirements of CWA §319, including the "Nine Key Elements of an Effective State Program" as listed in USEPA's *Nonpoint Source Program and Grants Guidance for Fiscal Year 1997 and Future Years*. The commenter requests that the TCEQ and TSSWCB revise the 2012 Management Program to comply with USEPA Guidance and the requirements of the CWA.	In comments received both formally through the public comment process and informally during the development of the Management Program document, USEPA-R6 has not identified any deficiencies in the Management Program with respect to CWA §319 or the 1997 Guidance. No changes to the document were made in response to this comment.
9-4			The commenter recommended the use of environmental results as objectives, to the greatest extent possible. For example, the Management Program could include loading reductions (consistent with the modeling that forms the basis of a TMDL or WPP) as an environmental metric that could be used as an objective. Or, in the short-term, appropriate goals could include the percentage of BMPs inspected and shown to be properly implemented. The commenter noted that the Management Program should include environmental endpoints and functional measures of success in order to comply with EPA requirements, as well as CWA §319(h)(11). Therefore, the commenter recommended that the State designate environmental endpoints in the Management Plan to be used as measures of success.	Environmental results are tracked and reported through each WPP or TMDL I-Plan, not in the Management Program document. Restoration of water quality is tracked and reported through the Integrated Report and the NPS Annual Report. Pollutant load reductions achieved through grant-funded projects are reported as milestones as described in Appendix E of this Management Program document and annually to EPA through the GRTS. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-5			The commenter recommended the inclusion of annual milestones for implementation of BMPs at the earliest practicable date. The commenter expressed concern that Texas has failed to establish self-reporting by grant recipients, or other ways to determine if BMPs are properly implemented, or even implemented at all. The commenter recommended the inclusion of reasonable steps for verification of implementation of BMPs funded with federal or state money. The commenter expressed concern that the Management Program fails to meet EPA guidance requiring the Management Program to employ appropriate programmatic and financial mechanisms that ensure that NPS programmatic funds are managed to maximize environmental benefits.	Milestones for implementation of BMPs and steps for verification of implementation of BMPs are currently required to be included in each WPP or TMDL I-Plan, not in this Management Program document. Both agencies have adequate fiscal procedures in place to satisfy the State's fiduciary responsibility to verify the implementation of BMPs funded with federal or state NPS grants. No changes to the document were made in response to this comment.
9-6			The commenter expressed concern that the short-term goals identified in the Management Program are open-ended. The commenter suggests that a short-term goal should be achievable within a 3-5 year time frame, which would allow the EPA and the public to evaluate the progress of the Program. Therefore, the commenter recommends the inclusion of goals and objectives with time horizons of less than five years.	In comments received both formally through the public comment process and informally during the development of this Management Program document, USEPA-R6 has not identified the goals and objectives as deficient or needing revision with respect to time horizons of less than five years. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-7			The commenter expressed concern that there is a lack of information on the results of TMDL and WPP implementation, and noted that information on the results is important, whether or not the efforts are successful. The commenter states that a claim of restoration of water quality (i.e., reversal of an impairment) should not be made without appropriate monitoring information. The commenter therefore recommended that the State adopt minimum monitoring requirements (method and timing) for any TMDL, WPP or other process to reduce NPS pollution to assure that the effectiveness of the process and individual components of it can be evaluated and revised if needed.	Monitoring requirements to assess effectiveness of implementation are currently required to be included in each WPP or TMDL I-Plan, not in this Management Program document. Furthermore, progress in improving water quality associated with projects that reduce pollutant loadings is reported in the NPS Annual Report. No changes to the document were made in response to this comment.
9-8			The commenter expressed concern that the Management Program fails to meet EPA guidance requiring the Management Program to employ appropriate mechanisms that ensure WPPs and TMDLs are implemented in a timely fashion. Accordingly, the commenter recommended that Texas include milestones and goals establishing date-certain deadlines for the implementation of TMDLs and WPPs for segments impaired as the result of NPS pollution. The commenter also recommended that the State adopt explicit goals for the abatement of agricultural NPS pollution in a minimum number of segments by a certain time.	Significant watershed-specific issues associated with differences in pollutant loadings, needed reductions in loading, and the solutions to be implemented necessitate that the timeframes for implementation be set in each WPP or TMDL I-Plan as it is developed, rather than in the Management Program document. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-9			The commenter recommended increased public availability of information related to implementation of BMPs funded by NPS funds, including information on the effectiveness of BMPs, the extent of their use in individual watersheds, and the identification of individual sources or types of sources not properly implementing the BMPs if using public funds.	Due to watershed variability, it is most appropriate to report progress toward implementing BMPs identified in WPPs or TMDL I-Plans (i.e., extent of BMP use in individual watersheds), through public engagement mechanisms associated with each specific watershed (e.g., CRP meetings, WPP or TMDL stakeholder meetings, various publications by regional and local governmental entities), rather than through this Management Program document. Both agencies continue to work with collaborating entities to increase the availability of this information in specific watersheds. Research on and demonstration of effectiveness of BMPs is a priority for the State. Additionally, BMP efficiencies used in specific WPPs or TMDL I-Plans are described in those documents. Both agencies have adequate fiscal procedures in place to satisfy the State's fiduciary responsibility to verify the proper implementation of BMPs funded with federal or state NPS grants. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-10			The commenter recommended that the State create a process to include consideration of demonstrated BMP effectiveness in prioritizing projects to be funded.	Consideration of demonstrated BMP effectiveness is currently incorporated into the identification of selected BMPs for each specific WPP or TMDL I-Plan and in the development of proposals seeking NPS grant funds. Both agencies do consider demonstrated BMP effectiveness when prioritizing proposals for funding as reflected in the evaluation and ranking criteria published with each agency's annual RFGA or Request for Proposals. No changes to the document were made in response to this comment.
9-11			The commenter noted that the State has failed to comply with EPA guidance because it has failed to submit a revised Management Program at least every five years, noting that the State last submitted a revision in December 2005. Therefore, the commenter recommended that TCEQ and TSSWCB make a priority out of completing the current revision. The commenter noted that the current extension offered to the State by USEPA-R6 in order to complete the current revision was merely to allow Texas to develop an adequate plan. The commenter expressed concern that this would alter the schedule for future revisions, and recommended that the State submit the next revision no later than December 2015.	On August 16, 2010, USEPA-R6 approved extending the applicability of the 2005 Management Program document through July 2012 in order to give the State time to incorporate new programmatic initiatives and ensure an adequate public review process for the next revision (2012 document). The State is on schedule to submit this 2012 revision to EPA by July 2012. Consistent with requirements in USEPA's *Nonpoint Source Program and Grants Guidance for Fiscal Year 1997 and Future Years* (*http://water.epa.gov/polwaste/nps/guide.cfm*), the State must revise the Management Program at least every five years. The next revision subsequently must be accomplished in FY2017. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-12			The commenter expressed concern that the proposed Management Program lacks accountability. Specifically, the commenter notes that the Management Program lacks meaningful quantitative milestones and specific overarching goals necessary for EPA, the public or elected officials to judge the progress of the Program.	Through information publically available in the NPS Annual Report, specific WPPs and TMDLs, and specific grant work plans and deliverables, USEPA-R6 has continued to be able to evaluate the Management Program and find that the State is making satisfactory progress to implement the Management Program. No changes to the document were made in response to this comment.
9-13			The commenter expressed concern that the proposed Management Program lacks transparency. Specifically, the commenter notes that the TSSWCB uses CWA §319(h) funds to develop and implement Water Quality Management Plans (WQMP), and that the WQMP Program is an important component of the Management Program. However, the commenter notes that, according to the Sunset Commission, the TSSWCB does not clearly identify the beneficiaries of the program or the anticipated results, nor does the TSSWCB routinely verify that WQMP grant recipients comply with the terms of grants.	TSSWCB is taking steps to address issues raised by the Sunset Commission and changes required by the Legislature. TSSWCB staff regularly report to the State Board on progress to implement these programmatic changes, including the issues raised by the commenter related to WQMPs. For WQMP financial incentives funded with CWA §319(h) monies, the Sunset Commission concluded that the "State Board's own NPS Grant Program... [has] developed ways to ensure grants are accountable and effective." No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-14			The commenter asserted that the proposed Management Program is deficient because it does not address the concerns of the Sunset Commission on the TSSWCB. Specifically, the commenter notes that the Sunset Commission raised several issues regarding the ability of TSSWCB to evaluate the impact of WQMPs on water quality improvement, to tie grants awarded to specific improvements in water quality, and to implement a consistent statewide method to conducting status reviews of WQMPs.	TSSWCB is taking steps to address issues raised by the Sunset Commission and changes required by the Legislature. TSSWCB staff regularly report to the State Board on progress to implement these programmatic changes, including the issues raised by the commenter related to WQMPs and status reviews. TSSWCB is now utilizing the SWAT model to evaluate the statewide impact of WQMPs on water quality improvement. No changes to the document were made in response to this comment.
9-15			The commenter asserted that the proposed Management Program is deficient because it does not address the concerns of the Sunset Commission on the TSSWCB and because it does not incorporate their recommendations. The commenter noted that the Sunset Commission made three recommendations to TSSWCB, including: 1) establish statewide policies in each state-funded grant program to ensure grantees continue to meet grant responsibilities over the life of the grant; 2) create a centralized complaint tracking system; and 3) measure grant impacts using either empirical or non-empirical methods, and report program results via the agency's website or any existing statutorily required annual publication. The commenter asserted that these recommendations apply equally to federally-funded programs as to state-funded programs.	TSSWCB is taking steps to address issues raised by the Sunset Commission and changes required by the Legislature. TSSWCB staff regularly report to the State Board on progress to implement these programmatic changes, including the three specific recommendations identified by the commenter. TSSWCB is in the process of developing a centralized complaint tracking system. TSSWCB is now utilizing the SWAT model to measure impacts of the WQMP Program. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-16			The commenter expressed a concern that many of the specific details needed to evaluate the Program are not included in the actual document, but rather are included by reference to other documents, which makes it more difficult to evaluate the commitments the State will make in the 2012 Management Program.	It is appropriate to incorporate by reference independently developed documents and provide information on where those documents may be obtained. Commitments in the form of milestones to evaluate the Management Program are defined in Appendix E. No changes to the document were made in response to this comment.
9-17			The commenter noted the reference on page 26 to the MOU between the agencies; however, the commenter expressed concern that the MOU does not provide sufficient detail specifically regarding the execution of the Management Program. Therefore, the commenter expressed a concern that the Program includes insufficient detail regarding the division of responsibility between the TCEQ and TSSWCB, both in implementing the Program, and in monitoring the effectiveness of the Program.	As approved by both the Commission and the State Board, the MOU defines the statutory jurisdictions of each agency and establishes the framework for the collaborative implementation of the Management Program. As described on page 26 of the Management Program, the MOA between the agencies provides additional detail on the programmatic mechanisms to implement the Management Program. No changes to the document were made in response to this comment.
9-18			The commenter noted that the Management Program should include the details and milestones of the individual Priority Watershed work plans. The Management Program discusses Priority Watershed Milestones on Page 39, but then refers the reader to the individual work plans for the actual milestones. The commenter notes that an inspection of the individual work plans often reveals that the work plans lack the level of detail required by EPA guidance for state NPS programs. The commenter notes that the incorporation of work plans does not adequately establish milestones/objectives as required by CWA §319(b)(2)(C).	Significant discussions between both agencies and USEPA-R6 annually result in work plans with sufficient detail such that the work plans are approved by USEPA-R6 and funded with federal CWA §319(h) grants. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-19			The commenter notes that EPA guidance on NPS pollution management programs explicitly states that atmospheric deposition constitutes a source of nonpoint pollution that should be addressed in state NPS pollution management programs. The commenter notes that Texas has numerous instances of atmospheric deposition that impact water quality, and that these nonpoint sources should be addressed in the Management Program.	Atmospheric deposition, like other categories of NPS pollution, is addressed in Table 6.2 of the Management Program. TCEQ solicited input from stakeholders regarding programs and practices used in the state to address all categories of NPS pollution during the update to the Management Program. Programs and practices designed to reduce pollutants from atmospheric deposition are presented in the Management Program including erosion and sediment controls and pesticide management practices. The document was changed in response to this comment.
9-20			The commenter notes that EPA guidance on NPS pollution management programs explicitly states that hydrologic modification constitutes a source of nonpoint pollution that should be addressed in state NPS pollution management programs. The commenter notes that Texas has numerous instances of hydrologic modifications that impact water quality, and that these nonpoint sources should be addressed in the Management Program.	Hydrologic modification, like other categories of NPS pollution, is addressed in Table 6.2 of the Management Program. TCEQ solicited input from stakeholders regarding programs and practices used in the state to address all categories of NPS pollution during the update to the Management Program. Programs and practices designed to reduce pollutants from hydrologic modification are presented in the Management Program including, streambank stabilization, low head dams, and noneroding roadways. The document was modified to clarify the management measures for hydromodification in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-21			The commenter expressed a general concern that the long- and short-term goals identified in the Management Program fail to incorporate stated objectives that conform to USEPA guidance. The commenter notes that USEPA guidance requires "objectives" to indicate both 1) the implementation steps related to a goal and 2) the results to be achieved, such as water quality improvements or load reductions. The commenter argues that the Management Program describes the activities that Texas intends to engage in, but that the Management Program does not contain explicit results (including any particular water quality results) to be achieved by those activities, as required by the USEPA. The commenter suggests that other states, such as New Mexico, have done a better job of identifying quantifiable objectives for their Management Programs. The commenter argued that the Management Program does not meet the requirements of CWA §319(b)(2)(C) because the section titled "Statewide Program Milestones" in Appendix E fails to set forth milestones that set goals related to environmental endpoints, such as attainment of water quality standards. The commenter cited as an example that no pollutant load reductions are established as milestones.	As described in the long- and short-term goals, and in the WAP process, the State's results-oriented goal for all water quality management programs, including this Management Program, is explicitly to achieve restoration of designated uses in impaired water bodies. The State will achieve this result through the implementation of TMDLs and WPPs, and specific BMPs, to abate and prevent NPS pollutant loading; milestones in Appendix E will be used to assess progress to accomplish this. In comments received both formally through the public comment process and informally as this Management Program document was being developed, USEPA-R6 has not identified the goals and objectives as deficient with respect to the 1997 Guidance. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-22			The commenter expressed concern regarding the objectives associated with Short-Term Goal One on page 36 of the Management Program. Short-Term Goal One seeks to target water quality assessment activities in high priority, NPS-impacted watersheds by coordinating with various entities. One of the five objectives in furtherance of this goal – Objective E – is to "conduct monitoring to determine effectiveness of TMDL I-Plans, WPPs, and BMP implementation." The commenter notes that both TCEQ and TSSWCB claim to conduct extensive monitoring of TMDLs, WPPs, and BMPs. However, the commenter feels that without the identification or specific endpoints or results, these objectives cannot be used to demonstrate progress. The commenter feels that simply stating that monitoring will be conducted is not enough. The commenter argues that Texas needs to identify the specific methods, inspections, sampling, and monitoring that will be used to obtain results.	Due to date specific conditions, monitoring requirements to assess effectiveness of implementation are currently required to be included in each WPP or TMDL I-Plan, not in this Management Program document. Additionally, monitoring specifics, associated with each grant-funded project conducting monitoring, are detailed in QAPPs as required by USEPA. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-23			The commenter expressed concern regarding the objectives associated with Short-Term Goal Two on page 36 of the Management Program. Short-Term Goal Two concerns the implementation of TMDL I-Plans and/or WPPs to reduce NPS pollution. One of the four stated objectives in furtherance of this goal – Objective B – is to develop and implement BMPs to address constituents of concern or water bodies not meeting water quality standards in watersheds identified as impacted by NPS pollution. The commenter argues that this objective is deficient because it fails to identify a specific schedule with anticipated dates of implementation, and that without such a timeline, the goal fails to ensure any measure of whether there is reasonable progress.	Milestones and schedules for implementation of BMPs and steps for verification of implementation of BMPs are currently required to be included in each WPP or TMDL I-Plan, not in this Management Program document. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-24			The commenter notes that not all BMPs currently implemented and developed by TSSWCB have been demonstrated to be effective. The commenter argues that the Management Plan should include adequate objectives to ensure that BMPs being implemented are effective.	TSSWCB selected requirements for WQMPs, and specific BMPs called for in WQMPs, based on the criteria outlined in the USDA NRCS Field Office Technical Guide (FOTG). The FOTG is the primary scientific reference for NRCS. The FOTG contains technical information about the conservation of soil, water, air, and related plant and animal resources. The FOTG is localized so that it applies to specific geographic areas. The FOTG includes information on the documented effects of each practice, and the standards and specifications for implementing each practice. Therefore, any BMP implemented through any WQMP certified by TSSWCB, including any of those BMPs implemented with federal or state NPS grants from TSSWCB, has been demonstrated to be effective, otherwise it would not be included in the suite of potential BMPs in the NRCS FOTG. Further, the TSSWCB then employs methods (water quality monitoring and/or modeling (TBET/SWAT)) to assess and report on the environmental effects of implementation consistent with 1) requirements by USEPA to report load reductions through GRTS, and 2) recommendations from the Sunset Commission to use either empirical or non-empirical methods to assess the impact of WQMPs. Finally, Appendix E of the Management Program establishes milestones for the State to report load reductions achieved from BMP implementation. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-25			The commenter notes that the use of TBET by TSSWCB does not accomplish ensuring that BMPs being implemented are effective because TBET does not provide for verification on a local or statewide level for the model.	The Texas BMP Evaluation Tool (TBET) is a user-friendly interface for the SWAT model which has been calibrated for Texas conditions and includes published BMP efficiencies. The use of TBET/SWAT is consistent with the Sunset Commission recommendation to use either empirical or non-empirical methods to assess the impact of WQMPs. No changes to the document were made in response to this comment.
9-26			The commenter observes that since the Lake O' the Pines TMDL was adopted in 2006 and the I-Plan approved in 2007, it is difficult to determine whether any implementation has taken place as there are no meaningful objectives with anticipated results in either the TMDL or I-Plan. The commenter states that while the development of the TMDL and I-Plan allowed the State to remove the impairment from the 303(d) List, it does not appear that the State has done anything to reduce pollutant loadings or restore water quality.	I-Plans in Texas follow an adaptive management strategy. Rather than establishing proscriptive requirements, stakeholders work together to design a plan that addresses the pollutant sources, is manageable for the participants, contains performance measures to guide in assessing progress, and responsibilities for tracking the progress. There are a number of management measures for unregulated sources that have been agreed to by the stakeholders and a number of entities have agreed to track progress. Over the next two years, the stakeholders will reconvene to discuss the progress that has been made and to adjust the Lake O' Pines I-Plan. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-27			The commenter observes that it appears the requirements of the Lake O' the Pines TMDL applicable to point sources have been either ignored or the permits have been renewed without the limits described in the TMDL.	The TCEQ has been working with EPA to put phosphorus load reductions as required by the Water Quality Management Plan in an individual permit. Negotiations between TCEQ and EPA are ongoing, and once this permit is issued, the TMDL I-Plan for Lake O' the Pines can be fully implemented.
9-28			The commenter expressed concern over past attempts by TCEQ and EPA to procure information from TSSWCB that TSSWCB denied, including requests associated with the Caddo Lake WPP and the Lake O' the Pines TMDL I-Plan. The commenter also expressed concern that TSSWCB did not make greater efforts to facilitate the release of confidential information. The commenter states that while TSSWCB can be justified under Texas law in maintaining the confidentiality of some information on individual operations, most of TSSWCB's information can be consolidated or provided in ways that give the agencies and the public the information needed to evaluate TSSWCB programs and to allow work on TMDLs, WPPs and other pollution reduction activities to be effective.	The confidentiality of certain information related to individual WQMPs is protected by the Texas Legislature as codified in §201.006 of the Texas Agriculture Code. Further, it is prudent for TSSWCB to solicit legal interpretations from the Texas Attorney General as to what information may and may not be publically disclosed. TSSWCB routinely provides NPS implementation data at an aggregated, watershed level to collaborating entities for use in developing TMDLs and WPPs and tracking the progress to implement those TMDLs and WPPs. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-29			The commenter believes that many agricultural producers would waive confidentiality for their WQMP information and allow EPA, TCEQ and the public access to it if TSSWCB simply asked the producers for permission to do so.	There is no affirmative burden on TSSWCB to ask agricultural producers to waive the statutorily-protected confidentiality of their WQMPs. Further, the suggestion that TSSWCB should ask producers to waive confidentiality creates an inconsistency with the Legislative intent of §201.006 of the Texas Agriculture Code. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-30			The commenter urged the TSSWCB to make more information available to EPA, TCEQ, and especially members of the public. The commenter specifically referred to information related to expenditures of federal and state funds and information needed to evaluate programs for NPS pollution. The commenter noted that open access to information is necessary in order to work effectively to address NPS problems, and also noted that members of the public, such as private sector groups and citizen groups, often have limited access to agency information. The commenter therefore suggested that TSSWCB and TCEQ collect, compile, and make available through a publicly accessible website information that is related to the success of the NPS program, including the implementation and effectiveness of BMPs and CWA §319-funded projects. The commenter argued that the Management Program does not meet the requirements of CWA §319(b)(3) because the Management Program does not, to the maximum extent possible, involve local public and private agencies and organizations with expertise in the control of NPS pollution when developing and implementing the Management Program. To support this lack of compliance with the CWA, the commenter cites the lack of information available to the public from the TSSWCB, and the inability of the TSSWCB to assemble and disclose information needed for implementation and evaluation of the NPS program. The commenter argued that without this information, local involvement will not occur. Accordingly, the commenter recommended increased availability of information to facilitate involvement of public and private organizations in the development and implementation of the Management Program.	Environmental results are tracked and reported through public engagement mechanisms associated with each WPP or TMDL I-Plan. Both agencies consistently engage local entities, such as SWCDs, cities, and counties, in the implementation of the Management Program and specific WPPs/TMDLs. Additionally, individual project webpages are available on the agencies' Web sites. Further, as required by USEPA under the CWA §319(h) NPS Grant Program, the State must report progress in meeting milestones, including reductions of pollutant loadings and on improvements to water quality achieved by implementing NPS pollution control practices through the *Annual Report on Managing NPS Pollution in Texas* and USEPA's GRTS. GRTS is USEPA's primary tool for oversight of the 319 grant program. Information in GRTS is publicly available at *http://iaspub.epa.gov/grts/home*. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-31			The commenter expressed concern that the State has yet to show that it can resolve an impairment caused by agricultural NPS pollution through the Management Program. The commenter argues that the agencies have erroneously pointed to the Aquilla Reservoir as a Management Program success story. The commenter argues that Aquilla Reservoir achieved attainment through private educational efforts by pesticide companies that took place before the development of the TMDL.	The Aquilla Reservoir success story, which was published by USEPA consistent with their requirements for documentation, is an example of where the implementation of control measures can be correlated to reductions in pollutant loadings (*http://water.epa.gov/polwaste/nps/success319/tx aquilla.cfm*). The Aquilla Reservoir atrazine impairment is a positive demonstration of how federal CWA programs (§303(d) and §319(h)), federal Farm Bill programs, and state water quality programs (e.g., TCEQ water quality monitoring, TSSWCB WQMPs) synergistically resulted in restoration of water quality. Actions initiated by farmers, private pesticide companies, local governmental entities, and state and federal agencies, once the water body was first identified as impaired in 1998 by TCEQ, directly resulted in the abatement of atrazine loading. The continued low levels of atrazine in finished drinking water, achieved through multiple years of implementation of NPS control measures, led TCEQ and USEPA to consider water quality in Aquilla Reservoir restored in 2004. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-32			The commenter also expressed concern that the WAP process, as depicted in Figure 1.1, mainly produces an endless cycle of meetings, and that the process should focus more on developing plans that ensure timely implementation and monitoring.	WAP is a process for coordinating, documenting, and tracking strategies and activities to protect and improve water quality. The major objectives of WAP are to engage stakeholders more fully in determining strategies that restore water quality, increase transparency of state agencies' water quality management decision-making, and improve accountability of state agencies' commitments to improve water quality. While WAP does consist of a cycle of meetings, it will directly result in action (planning, implementation, and monitoring) to restore water quality. No changes to the document were made in response to this comment.
9-33			The commenter argued that the Management Program does not meet the requirements of CWA §319(b)(2)(C) because the section titled "Statewide Program Milestones" in Appendix E fails to set forth annual milestones related to BMPs that ensure attainment of beneficial uses as expeditiously as possible. Accordingly, the commenter recommended the inclusion of annual milestones related to BMPs that ensure implementation of these practices at the earliest practicable date. The commenter expressed concern that the Management Program fails to meet EPA guidance requiring the Management Program to employ appropriate mechanisms that ensure expeditious implementation of BMPs, or other measures that would achieve demonstrable water quality improvements.	In comments received both formally through the public comment process and informally during the development of this Management Program document, USEPA-R6 has not identified any deficiencies with respect to expeditious implementation of BMPs. Additionally, the use of federal CWA §319(h) grants to implement BMPs is limited only to those watersheds were a WPP or TMDL I-Plan have been developed. No changes to the document were made in response to this comment.

Tracking Number	Date Received	Affiliation of Commenter	Summary of Request or Comment	Summary of TCEQ/TSSWCB Action or Explanation
9-34			The commenter noted that, based on the milestones set forth in Appendix E, the State proposes a decreasing number of projects intended to reduce loadings over the next five years. The commenter notes that for FY2017, there appear to be no commitments to conduct any watershed characterization projects, watershed coordination projects, WPP or TMDL development or implementation projects, or BMP effectiveness monitoring projects. According to the commenter, because the State intends to take on fewer and fewer projects that use BMPs, this cannot be said to be accomplishing implementation at the "earliest practicable date."	Milestones are estimated based upon existing grant commitments at the time of publication (up to and including FY2011 CWA §319(h) grant commitments between EPA, the State, and collaborating entities). As the commenter observes, the State is not able to predict specifically what new scopes of work will be approved in the future, thereby making predictions of future milestones problematic. Estimates and milestones in Appendix E will be revised as new grant commitments are executed. Document text has been revised to clarify this limitation.
9-35			The commenter states that CWA §319(h)(11) requires that the state's annual report include information regarding reductions in NPS pollutant loading and improvements in water quality for water bodies in which BMPs have been implemented.	As demonstrated in *Annual Report on Managing NPS Pollution in Texas* (*http://www.tsswcb.texas.gov/reports#nps*) , the State continues to document pollutant load reductions being achieved through implementation of NPS control measures. No changes to the document were made in response to this comment.