



Nueces River Authority

Basin Highlights Report

Nueces River Basin

San Antonio-Nueces Coastal Basin

Nueces-Rio Grande Coastal Basin

May 2006

Prepared in cooperation with the Texas Commission on Environmental Quality
Clean Rivers Program

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LIST OF ACRONYMS

CBCOG	Coastal Bend Council of Governments
CCS	Center for Coastal Studies
CPL	Central Power and Light Company
CR	County Road
CRP	Clean Rivers Program
DSHS	Department of State Health Services
DO	Dissolved Oxygen
EPA	United States Environmental Protection Agency
FM	Farm to Market Road
FY	Fiscal year
gpd	Gallons per Day
GIWW	Gulf Intracoastal Waterway
ICWW	Intracoastal Waterway
IH	Interstate Highway
ISD	Independent School District
LP	Limited Partnership
MUD	Municipal Utility District
NAS	Naval Air Station
NRA	Nueces River Authority
PCB	polychlorinated biphenols
RR	Railroad / Ranch Road
SH	State Highway
SHP	State Historic Park
SNA	State Natural Area
SP	State Park
SWQM	Surface Water Quality Monitoring
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
TGLO	Texas General Land Office
TMDL	Total Maximum Daily Load
TPWD	Texas Parks and Wildlife Department
TxDOT	Texas Department of Transportation
WCID	Water Control and Improvement District / Water Conservation and Improvement District
US	U. S. Highway
WSC	Water Supply Corporation
WPP	Watershed Protection Plan
WWTP	Wastewater Treatment Plant

INTRODUCTION

In 1991, the Texas Legislature passed the Texas Clean Rivers Act which requires basin-wide water quality assessments to be conducted for each river basin in Texas. Under this act, the Clean Rivers Program (CRP) has developed an effective partnership involving the Texas Commission on Environmental Quality (TCEQ), other state agencies, river authorities, local governments, industry, and citizens. Using a watershed management approach, the Nueces River Authority (NRA) and TCEQ work together to identify and evaluate surface water quality issues and to establish priorities for corrective action. Under CRP, NRA is responsible for the Nueces River Basin, the San Antonio – Nueces Coastal Basin, and the Nueces – Rio Grande Coastal Basin (Figure 1), an area roughly 31,500 square miles, ranging from the hill county in Edwards County to San Antonio Bay in Refugio County to the Brownsville Ship Channel in Cameron County.



Figure 1. NRA's Basins of Responsibility

The Nueces River Basin covers approximately 17,000 square miles, encompassing all or part of 23 counties in South-Central Texas. Other rivers within the basin include the Frio, Leona, Sabinal, and Atascosa Rivers. The basin is bordered by the Colorado, Guadalupe, and San Antonio River Basins to the north, the San Antonio – Nueces Coastal Basin to the southeast, the Nueces – Rio Grande Coastal Basin to the south, and the Rio Grande River basin to the south and southwest. Throughout the basin, the rivers are used for water supply and recreational purposes. The basin is home to numerous state-operated recreational areas including: Choke Canyon State Park (SP) on the south side of Choke Canyon Reservoir near Three Rivers, Lake Corpus Christi SP on the

southeast bank of Lake Corpus Christi near Mathis, Garner SP north of Concan, Tips State Recreational Area on the Frio River in Three Rivers, Lipantitlan State Historic Park (SHP) near Sandia, Lost Maples State Natural Area (SNA) north of Vanderpool, and Hill Country SNA north of Hondo.

The San Antonio – Nueces Coastal Basin is approximately 3,100 square miles, covering all or part of 7 counties. The basin is bordered by the San Antonio River Basin to the north, the Lavaca-Guadalupe Coastal Basin to the northeast, bays, estuaries, and the Gulf of Mexico to the east, the Nueces-Rio Grande Coastal Basin to the south, and the Nueces River Basin to the northwest. Being a coastal area, the basin is naturally host to several state-operated recreational areas. These include Goose Island SP near Rockport, Copano Bay State Fishing Pier along State Highway 35 north of Fulton, Fulton Mansion SHP in Fulton, and the Aransas National Wildlife Refuge in Aransas County.

The Nueces – Rio Grande Coastal Basin covers approximately 10,400 square miles, encompassing all or part of 12 counties in South Texas. The basin is bordered by the Nueces River Basin and the San Antonio – Nueces Coastal Basin to the north, bays, estuaries, and the Gulf of Mexico to the east, and the Rio Grande River Basin to the south and southwest. The inland area of the basin is dominated by large ranches, including the King Ranch. State-operated recreational areas are primarily along the coast and include Mustang Island SP, Port Isabelle Light House SHP in Port Isabel, and the Padre Island National Seashore.

2005 BASIN HIGHLIGHTS

From Feast to Famine

2005 started off on a positive note for much of the Nueces River Basin with respect to the amount of surface water stored in the reservoir system. Both Lake Corpus Christi and Choke Canyon Reservoir, which are collectively referred to as the reservoir system, had a combined capacity of at least 95% for the longest duration in the history of the reservoir system. From mid June 2002 through late April 2005, the reservoir system maintained near full capacity until a combination of low rainfall and high evaporation rates began to take effect.

Despite a very active hurricane season with two near misses, the Nueces River Basin and the Nueces Coastal Basins received very little precipitation during the summer and fall of 2005. In Corpus Christi, a yearly deficit of nearly seven inches brought the annual total to 25.3 inches. Some locations in the basin recorded greater deficits resulting in severe drought status by the U.S. Drought Monitor. The Palmer Drought Severity Index, Figure 2 (downloaded from <http://www.txwin.net/Monitoring/Meteorological/Drought/pdsi.htm>), shows that as of April 1, 2006, the most upper portion of the Nueces Basin is considered to be in a mild drought, but the rest of the area is considered to be in a severe drought. By the end of December 2005, lack of major rainfall reduced reservoir system down to 81.9% of capacity. As of April 30, 2006, the system dropped to 75.2% of capacity.

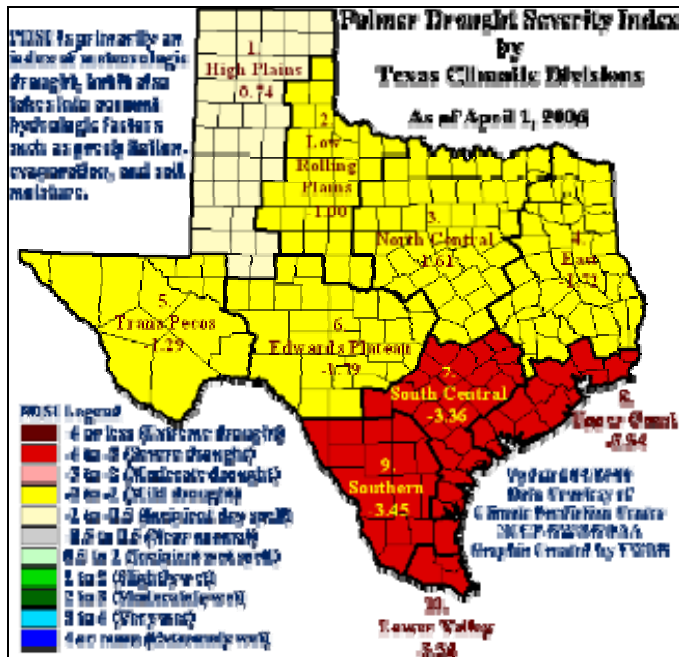


Figure 2. Palmer Drought Severity Index

2006 Water Quality Assessment

TCEQ is currently conducting the 2006 Water Quality Assessment. The assessment will be a full assessment, assessing all segments for all uses, were applicable, using data from December 1, 1999 to November 30, 2004. This information will not be available until after publication of this report. Therefore, this report provides the information from the 2002 and 2004 Assessments, with updates where possible. Each segment in NRA's area of responsibility is discussed in detail in the Water Quality Data Review section of this report, beginning on Page 3.

Cameron County Non Point Source Monitoring Project

NRA has completed the sampling for the Cameron County Non Point Source (NPS) Monitoring Project. NRA conducted monthly sampling from January 2004 through August 2005 to provide pre-construction data for a proposed retention facility and wetland treatment system. More information on the project and graphs of the data analysis are presented in the Special Studies Section of the report, beginning on Page 59.

Total Maximum Daily Load Projects

There are eight Total Maximum Daily Load (TMDL) projects, on 17 segments, and one Watershed Protection Plan (WPP), on three segments, underway within NRA's area of responsibility. They are all discussed in more detail in the respective segment discussions in the Water Quality Data Review section. Links

to the official TMDL websites are also provided. NRA participates in as many of the stakeholder meetings as possible.

Field Audit

TCEQ conducted a field audit on NRA in August 2005. Their report primarily consisted of three minor negative findings and two very positive findings. The negative findings were: (1) changes to field records not consistently initialed and dated; (2) metal sample preservation not consistently documented on Chain of Custody forms; and (3) training records not retained in staff personnel files. All findings have been corrected, and none of them caused any data to be rejected.

The positive findings included: (1) NRA's project manager/quality assurance officer conducts a review of 100% of the water quality data produced under CRP. Given the volume of data reported to TCEQ by NRA, this level of review is notable. In addition, the data rejection rate is very low, indicating that program procedures are being followed and are very effective; (2) The website produced by NRA is one of the more informative ones observed. Customers are provided several options for queries and can produce a plethora of reports.

New Website

NRA has redesigned, reorganized, and improved our website. Not to worry – all the information is still there. NRA encourages you to take a look and provide feedback: <http://www.nueces-ra.org>.

OVERVIEW OF WATER QUALITY MONITORING

NRA coordinates with TCEQ's TMDL team and Surface Water Quality Monitoring (SWQM) personnel from Regions 13, 14, 15, and 16 every spring to develop the monitoring schedule for the next fiscal year (FY). The Center for Coastal Studies (CCS) at Texas A&M University-Corpus Christi conducts TMDL sampling and also participates in the meeting. This coordination allows each entity to maximize their sampling efforts by avoiding duplication of effort, and assures that the parameters needed for assessment are being collected at the required stations.

The Lower Colorado River Authority has implemented a state-wide monitoring schedule: <http://cms.lcra.org>. The online schedule is an invaluable tool for water quality monitoring coordination. The program enables users to keep their individual monitoring schedules up-to-date and allows all users access to the most current information. The program is easy to use and has saved numerous hours previously spent on generating updated schedules and disseminating that information.

A detailed list of stations, the type of monitoring being performed, the monitoring entity, and the monitoring frequency for FY 2006 are included in the Water Quality Data Review section of this report. Routine monitoring consists of conventional and field parameters, bacteria, and flow, where applicable. Appendix 1 lists the individual parameters for conventional, bacteria, field, and metals for those stations monitored by NRA. (Metals in sediment sampling is not being conducted in FY 2006 since analysis to date has not shown any elevated levels. Periodic sampling, every two or three years, may be conducted as a

precautionary measure.) Appendix 2 gives a brief explanation of each parameter.

The data collected are used to assess the water quality with respect to aquatic life use, contact recreation, public water supply, and fish consumption as defined in the Texas Surface Water Quality Standards.

The standards associated with aquatic life use are designed to protect plant and animal species that live in and around the water. They establish optimal conditions for the support of aquatic life and define indicators used to measure if these conditions are met. Some pollutants or conditions that may violate this standard include low levels of dissolved oxygen (DO), or toxic substances such as metals or pesticides. The concentration of DO is a single, easy-to-measure characteristic of water that typically correlates with the occurrence 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. A related problem is an excess of nutrients in water. Large quantities of nutrients in water can cause excessive growth of vegetation. This excessive vegetation, often called an algal bloom, reduces DO in the water column as dead plant material decomposes. Water with a low concentration of DO is called hypoxic. Changes in dissolved solids concentrations also affect the quality of habitat for aquatic life. Metals also pose a threat to livestock and aquatic life.

The standard associated with contact recreation use measures the level of certain bacteria in water to estimate the relative risk of swimming or other sports involving direct contact with the water. It is possible to swim in water that does not meet this standard without becoming ill; however, the probability of becoming ill is higher than it would be if bacteria levels were lower. *E. coli* in fresh waters and Enterococci in marine waters are measured to determine the relative risk of swimming. Bacteria originate from the wastes of warm-blooded animals; their presence indicates that pathogens from these wastes may be reaching a body of water from such sources as inadequately treated sewage, improperly managed animal waste from livestock, pets in urban areas, aquatic birds and mammals, or failing septic systems.

Standards associated with public water supply indicate whether water from a lake or river is suitable for use as a source for a public water supply system. Source water is treated before it is delivered to the tap; a separate set of standards govern treated drinking water. 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. 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 uses. High concentrations of metals such as cadmium, mercury, and lead pose a threat to drinking water supplies and human health.

The standards associated with fish consumption are designed to protect the public from consuming fish or shellfish that may be contaminated by pollutants in the water. The standards identify levels at which there is a significant risk that

certain toxic substances dissolved in water may accumulate in the tissue of aquatic species. However, because these levels do not always predict when toxic substances will accumulate in fish to unsafe concentrations, the state also conducts tests on fish and shellfish tissue to determine if there is a risk to the public from consuming fish caught in state waters. The standards also specify bacterial levels in marine waters to assure that oysters or other shellfish that may accumulate bacteria from the water are safe for commercial harvest, sale, and consumption by the public. Eating fish contaminated with metals can cause these toxic substances to accumulate in human tissue, posing a significant health threat. Toxic substances from pesticides and industrial chemicals, called organics, pose the same concerns as metals. Polychlorinated biphenols (PCBs), for example, are industrial chemicals that are toxic and probably carcinogenic. Although banned in the United States in 1977, PCBs remain in the environment, and they accumulate in fish and human tissues when consumed.

The Department of State Health Services (DSHS), formerly the Texas Department of Health, 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. To reduce health risks in areas of contamination, people should eat smaller fish from a variety of water bodies. 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.

WATER QUALITY DATA REVIEW

This section is divided into four subsections, one for the Nueces River Basin, the San Antonio-Nueces Coastal Basin, the Nueces-Rio Grande Coastal Basin, and the Bays, Estuaries, and Gulf of Mexico. The discussion for each section contains:

- A description of the segment
- A map of the segment with FY 2006 monitoring stations and active permitted outfalls plotted
- Detailed information about the FY 2006 monitoring stations (parameters sampled, frequency of sampling, and the responsible agency)
- A discussion of any impairments or concerns in the segment
- A list of active permitted outfalls

There are two tables at the beginning of each subsection. The first table summarizes identified concerns, impairments and TMDL projects. The second table lists the FY 2006 monitoring stations in each segment.

A concern is identified when a parameter exceeds the standard in 10% - 25% of the samples. An impairment is identified when a parameter exceeds the standard in 25% or more of the samples.

The 2002 Assessment was the last assessment to evaluate all uses for all segments. The assessment used data from March 1, 1996 to February 28, 2001. The 2004 Assessment, using data from March 1, 1998 to February 28, 2003, primarily evaluated segments and parameters that were identified as concerns or impairments in the 2002 Assessment. The 2006 Assessment will be a full assessment, using data from December 1, 1999 to November 30, 2004. At the time of this writing, the 2006 Assessment has not yet been completed. Therefore, the concerns and impairments described in this report are no different than those reported in the 2005 Basin Highlights Report. However, updates are included when possible.

Appendix 1 lists the individual parameters for conventional, bacteria, field, and metals for those stations monitored by NRA. Appendix 2 gives a brief explanation of each parameter.

Segment discussions are organized geographically, being with the Nueces River Basin. The discussion for each river begins with the most upstream segment and progressing to the most downstream segment. The bay segments are discussed beginning with the most northern segment and progressing southward.

Nueces River Basin

The Nueces River Basin, Figure 3, covers approximately 17,000 square miles, encompassing all or part of 23 counties in South-Central Texas. Other rivers within the basin include the Frio, Leona, Sabinal, and Atascosa Rivers. The basin is bordered by the Colorado, Guadalupe, and San Antonio River Basins to the north, the San Antonio – Nueces Coastal Basin to the southeast, the Nueces – Rio Grande Coastal Basin to the south, and the Rio Grande River basin to the south and southwest. Throughout the basin, the rivers are used for water supply and recreational purposes. The basin is home to numerous state-operated recreational areas including: Choke Canyon State SP on the south side of Choke Canyon Reservoir near Three Rivers, Lake Corpus Christi SP on the southeast bank of Lake Corpus Christi near Mathis, Garner SP north of Concan, Tips State Recreational Area on the Frio River in Three Rivers, Lipantitlan SHP near Sandia, Lost Maples SNA north of Vanderpool, and Hill Country SNA north of Hondo.

There are 15 stream and two lake segments in the basin. TMDLs are being conducted on five of the stream segments. Water quality monitoring for FY 2006 includes 35 sites with at least one site on every segment. All of the segments will be discussed in detail in the following sections.



Figure 3. Nueces River Basin



Upper Nueces River at SH 55, south of Barksdale



Nueces River at SH 16 south of Tilden

Table 1. Assessment Summary for the Nueces River Basin

Segment	Description		Concerns	Impairments	TMDL
2101	Nueces River Tidal		Excessive Algal Growth		Zinc in Oyster Tissue (Segment 2482)
2104	Nueces River Above Frio River	25 miles surrounding SH 16	Chloride and TDS	Depressed DO	South Central Texas Bacteria and DO
		Remainder of segment	Chloride and TDS		
2107	Atascosa River	Lower 25 miles	TDS	Bacteria	South Central Texas Bacteria and DO
		25 miles surrounding US 281	Ammonia Excessive Algal Growth TDS	Bacteria Depressed DO	
		Remainder of segment	TDS		
2109	Leona River		Nitrate+nitrite nitrogen Sulfate		
2110	Lower Sabinal River			Nitrate+nitrite nitrogen	Lower Sabinal Nitrate+nitrite
2113	Upper Frio River	25 miles surrounding SH 127		Depressed DO	South Central Texas Bacteria and DO
2115	Seco Creek	Upper 25 miles	Temperature		
2116	Choke Canyon Reservoir	5120 acres near dam		TDS Bacteria	
		Small north arm near dam and Willow Hollow Tank		TDS Bacteria	
		5120 acres in middle of lake		TDS	
		Large north arm near mid-lake and Jacob oil field		TDS Bacteria	
		Southern arm near mid-lake and Rec. Road 7 west of Calliham	Depressed DO	TDS Bacteria	
		Western end of lake to RR bridge	Depressed DO	TDS Bacteria	
		Remainder of lake		TDS Bacteria	
2117	Frio River Above Choke Canyon Reservoir	Lower 25 miles	Chloride and TDS	Bacteria Depressed DO	
		2 miles downstream of SH 97 to 14 miles upstream of SH 97	Chloride and TDS	Bacteria Depressed DO	
		25 miles surrounding La Salle CR crossing north of SH 97	Chloride and TDS	Depressed DO	
		25 miles surrounding IH 35	Chloride and TDS	Depressed DO	
		25 miles surrounding FM 187	Chloride and TDS		
		Remainder of segment	Chloride and TDS		

Table 2. FY 2006 Monitoring Stations for the Nueces River Basin

Segment	Station ID	Station Description
2101	12960	Nueces River Tidal North of Viola Turning Basin
	12961	Nueces River Tidal Bridge on US 77 / IH 37 Below Dam and Salt Water Barrier
2102	12964	Nueces River Below Lake Corpus Christi at Bluntzer Bridge on FM 666
	12965	Nueces River Below Lake Corpus Christi At La Fruta Bridge, SH 359
2103	12967	Lake Corpus Christi Mid-lake at the Dam
	17648	Lake Corpus Christi At Live Oak CR 151 near River Creek Acres Upstream of Lake Corpus Christi
	18350	Lake Corpus Christi Mid-lake 1.42 KM East of the Intersection of Canyon Dr and McWhorter Dr in the Lagarto Subdivision
2104	12973	Nueces River Above Frio River At SH 16 South of Tilden
2105	12975	Nueces River Above Holland Dam At IH 35 South of Cotulla
2106	12977	Nueces River / Lower Frio River At US 72 in Three Rivers
	12978	Nueces River / Lower Frio River At US 59 East of George West
	12979	Nueces River / Lower Frio River At Nueces River Bridge on US 281 South of Three Rivers
2107	12980	Atascosa River At FM 99 Bridge West of Whitsett
	12982	Atascosa River At US 281 at Pleasanton
2108	12983	San Miguel Creek At SH 16 North of Tilden
2109	12985	Leona River At FM 1581 Southwest of Pearsall
	12987	Leona River At Hwy 57 Near Batesville
	12989	Leona River At Hoag's Dam (Upstream side) (Ft. Inge)
	18418	Leona River 370 M KM Upstream of FM 140
2110	12993	Lower Sabinal River Bridge on US 90 West Of Sabinal
2111	12994	Upper Sabinal River 12.5 Miles North of Sabinal and 2.3 Miles Downstream From the Mouth of Onion Creek
2112	12996	Upper Nueces River US 57 South of Uvalde
	13005	Upper Nueces River At SR-55, South of Barksdale
	16704	Upper Nueces River At SH 55 Bridge, 2.5km South of Laguna
	17143	Upper Nueces River Lake Averhoff (Upper Nueces Lake) Mid-Lake at Boat Ramp Off Dirt Road 0.5 mi North of FM 1025, 6.5 mi North of Crystal City
2113	13006	Upper Frio River At SH 127 East of Concan
2114	13010	Hondo Creek Downstream From Bridge on Ranch Road 462 Near Tarpley
	18408	Hondo Creek Mid Channel Immediately Downstream of SH 173 Southeast of Hondo
2115	13013	Seco Creek At Miller Ranch Near Utopia
2116	13020	Choke Canyon Reservoir Mid-lake on Live Oak/McMullen County Line (Near Old Hwy 99)
	17389	Choke Canyon Reservoir Approximately 0.5 km Southeast of RR 66 Southern Most Bridge Crossing the Frio River Arm
2117	13023	Frio River Above Choke Canyon Reservoir At SH 16 in Tilden
	13024	Frio River Above Choke Canyon Reservoir At US 35 North of Dilley
	15449	Frio River Above Choke Canyon Reservoir At FM 187 8 Mi. South of Sabinal
	18373	Frio River Above Choke Canyon Reservoir Immediately Upstream of SH 97 North of Fowlerton

Nueces River

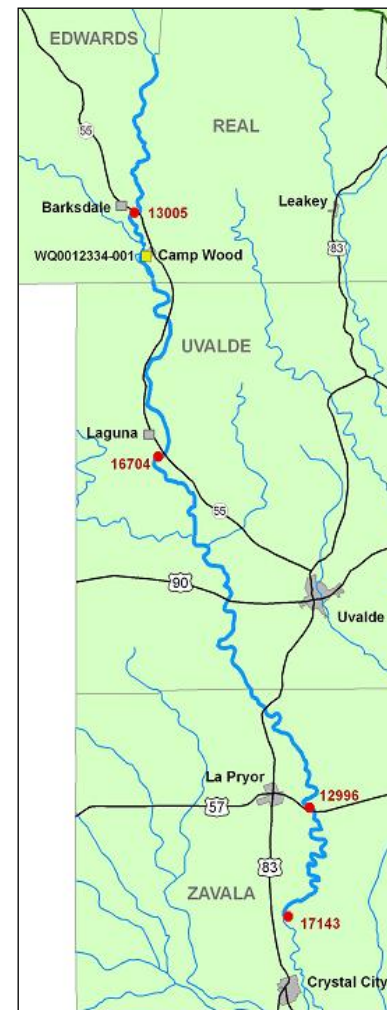


Figure 4. Nueces River

The Nueces River originates in Edwards County in the Texas Hill Country and terminates in Nueces Bay in Nueces County. The river crosses the Edwards Aquifer Recharge Zone in Uvalde County. During extended dry periods, surface flows may disappear, but re-emerge near US 90 as a result of spring flows. The braided reach of the river, primarily in McMullen County, is an area with a very low gradient, resulting in many interconnected channels and low flow. The Frio River flows into the Nueces River below Choke Canyon Reservoir near Three Rivers, Texas. The Nueces River is impounded by Wesley Seale Dam near Mathis, Texas to create Lake Corpus Christi, a primary water supply for the City of Corpus Christi and surrounding area. The reach below Lake Corpus Christi is prone to flooding, especially when Lake Corpus Christi is full and unable to capture flood waters. The tidal segment begins at the Calallen saltwater barrier dam in Corpus Christi.

The Nueces River is divided into six classified stream segments and one reservoir segment. Water quality monitoring for FY 2006 includes 16 sites with at least one site on every segment (includes one on the Frio River in Segment 2106). Each segment is discussed in more detail in the following sections, beginning with the most upstream segment and ending with the tidal segment.

2112 – Upper Nueces River



123 miles: from a point 100 m (110 yards) upstream of FM 1025 in Zavala County to the confluence of the East Prong Nueces River and Hackberry Creek in Edwards County.



Station 13005: May 2005

The segment is divided into three assessment units; the lower 25 miles, the 25 miles surrounding RR 334 and US 55, and the remainder of the segment.

2006 Monitoring Lower 25 Miles 12996 – US 57 South of Uvalde

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 16
Bacteria	4	
Field	4	

2112 – Upper Nueces River (continued)

17143 – Lake Averhoff (Upper Nueces Lake) Mid-Lake at Boat Ramp Off Dirt Road 0.5 mi North of FM 1025, 6.5 mi North of Crystal City

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 16
Bacteria	4	
Field	4	

25 Miles Surrounding RR 334 and US 55

16704 – At SH 55 Bridge, 2.5km South of Laguna

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 13
Bacteria	4	
Field	4	

Remainder of Segment

13005 – At SH 55, South of Barksdale

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

Impairments and Concerns

There are no impairments or concerns on this segment.

Active Wastewater Permits

WQ0012334-001 – City of Camp Wood: 101,000 gallons per day (gpd) via irrigation on 14 acres.

2105 – Nueces River Above Holland Dam

78 miles: from Holland Dam in LaSalle County to a point 100 m (110 yards) upstream of FM 1025 in Zavala County.

The segment is divided into three assessment units; the lower 25 miles, the 25 miles around FM 190, and the remainder of the segment.

2006 Monitoring

Lower 25 Miles

12975 – At IH 35 South of Cotulla

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 16
Bacteria	4	
Field	4	

Impairments and Concerns

There are no impairments or concerns in this segment.

2105 – Nueces River Above Holland Dam (continued)



Active Wastewater Permits

WQ0000546-000 – Del Monte Foods (Crystal City Plant)

WQ0004292-000 – Cotulla Border Patrol Station

WQ0010098-001 – City of Crystal City

WQ0010145-001 – City of Carrizo Springs: 950,000 gpd: Carrizo Creek to Soldier Slough to the Nueces River.

WQ0010153-001 – City of Cotulla: 990,000 gpd: Mustang Creek to the Nueces River.

WQ0013746-001 – City of Asherton: 180,000 gpd: unnamed tributary to El Moro Creek to Soldier Slough to the Nueces River.

WQ0013782-001 – City of Big Wells: 150,000 gpd: unnamed tributary to Arroyo Negro to the Nueces River.

WQ0014006-001 – Zavala County (Crystal City Land Fill): 50,000 gpd: Turkey Creek to Espantosa Lake to Soldier Slough to Soldier Lake to Soldier Slough to the Nueces River.

2104 – Nueces River Above Frio River

91 miles: from the confluence of the Frio River in Live Oak County to Holland Dam in LaSalle County.

The segment is divided into two assessment units; the 25 miles surrounding SH 16 and the remainder of the segment.



2006 Monitoring 25 Miles Surrounding SH 16 12973 – At SH 16 South of Tilden

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

At the coordinated monitoring meeting for FY 2006, the discussion arose as to whether or not an additional monitoring site is needed on this segment. Two sites, 12972 – at bridge on county road 1.2 miles north of Simmons and 12974 – at FM 624, have been identified as possible additional sites. With respect to more of a consistent stream flow, 12972 is the better site. This site was considered during the FY 2007 coordinated monitoring meeting and will be added to the monitoring schedule.

2104 – Nueces River Above Frio River (continued)

Impairments

The 25 miles surrounding SH 16 portion of the segment was identified in the 2000 Assessment as impaired due to depressed DO. A TMDL to address the low DO problem was conducted. 24-hour DO samples were collected at stations 12972, 12974, and 17897. The Executive Summary of the Final Report states:

“None of the means of average and minimum values of 24-hour dissolved oxygen samples for any of the three sampling stations exceeded their respective TCEQ criteria. However, the number of 24-hour samples of dissolved oxygen collected thus far on Segment 2104 is not sufficient to make a determination of support of aquatic life use, and additional sampling will continue.”

However, three samples at 12974 exceeded the average criteria and two samples exceeded the minimum criteria. The report goes on to state:

“Based on this information, remediation of low dissolved oxygen in Segment 2104 would not be recommended at this time.”

More information is available at

http://www.tceq.state.tx.us/implementation/water/tmdl/31-sc_bacox_project.html.

Concerns

Chloride and total dissolved solids (TDS) are identified as concerns for the entire segment. Both parameters had unusually high readings in June 1998. In each case, the one anomaly caused the mean to exceed the standard. Both parameters will most likely be removed as a concern as a result of the 2006 Assessment.

Active Wastewater Permits

WQ0004184-000 – Webb County – Colorado Acres Water Plant: 28,800 gpd via evaporation.

WQ0010088-001 – Freer Water Control and Improvement District (WCID): 280,000 gpd via surface irrigation on 250 acres of nonpublic access agricultural land.

WQ0013943-001 – Encinal Water Supply Corporation (WSC): 95,000 gpd via irrigation on 40 acres.

2106 – Nueces River / Lower Frio River



27 miles: from a point 100 m (110 yards) upstream of US 59 in Live Oak County to Choke Canyon Dam in Live Oak County.

The segment is divided into two assessment units; the lower 17 miles and the upper 10 miles.

2006 Monitoring

Upper 10 Miles

12977 – At US 72 in Three Rivers

Parameter	Frequency	Agency
Metals in Water	2	NRA
Conventional	4	
Bacteria	4	
Field	4	

Lower 17 Miles

12978 – At US 59 East of George West

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

2106 – Nueces River / Lower Frio River (continued)

12979 – Nueces River Bridge on US 281 South of Three Rivers

Parameter	Frequency	Agency
Metals in Water	2	NRA
Conventional	4	
Bacteria	4	
Field	4	

Impairments and Concerns

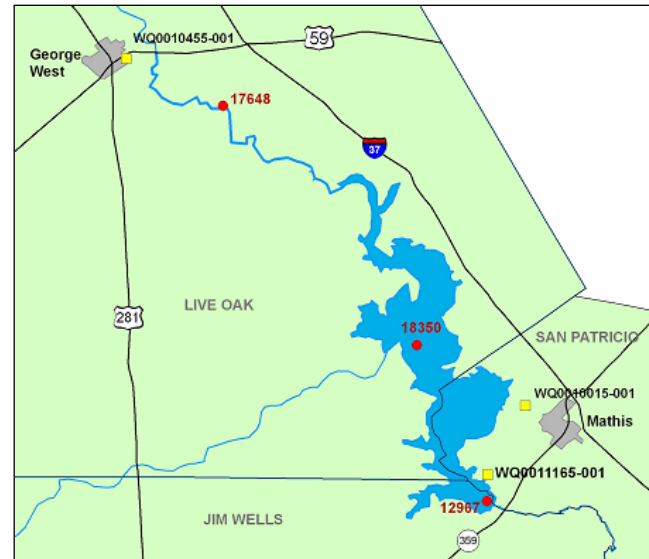
There are no impairments or concerns in this segment.

Active Wastewater Permits

WQ0001353-000 – Diamond Shamrock Refining Company: 3,000,000 gpd: unnamed ditch to the Lower Frio River.

WQ0010301-001 – City of Three Rivers: 400,000 gpd.

2103 – Lake Corpus Christi



21,900 acres: from Wesley E. Seale Dam in Jim Wells/San Patricio County to a point 100 m (110 yards) upstream of US 59 in Live Oak County, up to the normal pool elevation of 94.0 feet (impounds Nueces River).

The lake is divided into six assessment units; the area approximately 4

miles SE of FM 3162 and FM 534 intersection near western shore, mid-lake near the dam, upper arm of lake at FM 534 crossing, upper portion of lake on opposite shore from Hideaway Hill, western arm of lake near Largarto Creek inlet, and the remainder of the lake.

2103 – Lake Corpus Christi (continued)

2006 Monitoring

Mid-lake Near Dam

12967 – Mid-lake at the Dam

Parameter	Frequency	Agency
Metals in Water	2	NRA
Conventional	4	
Bacteria	4	
Field	4	

Western Arm of Lake Near Lagarto Creek

18350 – Mid-lake 1.42 KM East of the Intersection of Canyon Dr. and McWhorter Dr. in the Lagarto Subdivision

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

Remainder of Lake

17648 – At Live Oak CR 151 near River Creek Acres Upstream of Lake Corpus Christi

Parameter	Frequency	Agency
Metals in Water	2	NRA
Conventional	4	
Bacteria	4	
Field	4	

Impairments and concerns

There are no impairments or concerns in this segment.

Active Wastewater Permits

WQ0010015-001 – City of Mathis: 947,000 gpd: ditch to an unnamed reservoir to an unnamed tributary to Lake Corpus Christi.

WQ0010455-001 – City of George West: 639,000 gpd: Timon Creek to the Nueces River.

WQ0011165-001 – Texas Parks and Wildlife Department (TPWD) – Lake Corpus Christi SP: 67,000 gpd via evaporation and surface irrigation of 25 acres of non-public access land.

2102 – Nueces River Below Lake Corpus Christi



39 miles: from Calallen Dam 1.7 km (1.1 miles) upstream of US 77/IH 37 in Nueces/San Patricio County to Wesley E. Seale Dam in Jim Wells/San Patricio County.

This segment is divided into two assessment units; the upper 14 miles and the lower 25 miles.

2006 Monitoring

Upper 14 miles

12965 – At La Fruta Bridge, SH 359

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

Lower 25 miles

12964 – At Bluntzer Bridge on FM 666

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

Impairments and concerns

There are no impairments or concerns in this segment.

Active Wastewater Permits

WQ0002027-000 – Wright Materials, Inc.

2101 – Nueces River Tidal



12 miles: from the confluence with Nueces Bay in Nueces County to Calallen Dam 1.7 km (1.1 miles) upstream of US 77/IH 37 in Nueces/San Patricio County.

2006 Monitoring

12960 – North of Viola Turning Basin

Parameter	Frequency	Agency
24hr DO	1	TCEQ Region 14
Conventional	4	
Bacteria	4	
Field	4	
Metals in Water	4 (Zinc)	TCEQ TMDL (CCS)
Field	4	

12961 – Bridge on US 77 / IH 37 Below Dam and Salt Water Barrier

Parameter	Frequency	Agency
Metals in Water	4 (Zinc)	TCEQ TMDL (CCS)
Field	4	

Impairments

There are no impairments in this segment.

Although zinc in oyster tissues is not an impairment or concern, CCS is collecting metals samples in this segment as part of the Nueces Bay TMDL. More information is available at

<http://www.tceq.org/implementation/water/tmdl/21-nuecesbay.html>.

2101 – Nueces River Tidal (continued)

Concerns

There is a concern for excessive algal growth, based on chlorophyll a measurements, on this segment. One reason for the high readings in this segment has to do with the nature of the tidal segments. When there is low flow in the non-tidal segment, the tidal segment does not get flushed, but “flows” back and forth with the tides. The Rincon Diversion Pipeline, when completed, will transfer a portion of the City of Corpus Christi’s bay and estuary pass through requirements directly to the upper delta, bypassing the tidal segment. During low-flow conditions, the possibility of high chlorophyll a measurements may increase.

Active Wastewater Permits

WQ000531-000 – Flint Hill Resources Limited Partnership (LP): ditch to Nueces River Tidal.

WQ0001255-000 – Central Power and Light Company (CPL) Lon C. Hill Power Station: 1,098,000 gpd via Outfall 001; intermittent and flow variable basis via Outfall 002. The plant is no longer in operation, but the permit is still active.

WQ0010401-006 – City of Corpus Christi (Allison Plant): 5,000,000 gpd via Outfalls 001 and 002 (Nueces Bay).

WQ0013644-001 – San Patricio County Municipal Utility District (MUD) No. 1: 75,000 gpd: unnamed ditch to Hondo Creek to Nueces River Tidal.

FRIO RIVER

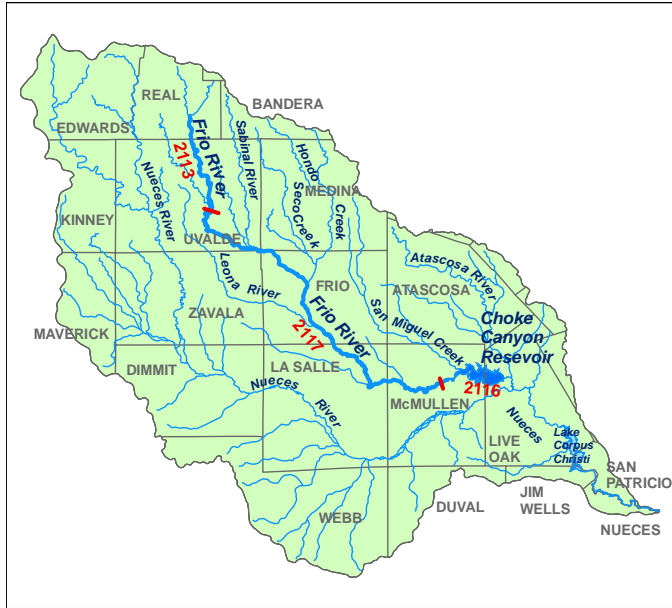


Figure 5. Frio River

The Frio River originates in Real County in the Texas Hill Country and terminates at its confluence with the Nueces River in Live Oak County. The river crosses the Edwards Aquifer Recharge Zone in Uvalde County. During extended dry periods, surface flows may disappear, but re-emerge a few miles south of US 90 as a result of spring flows. The Frio River is impounded by Choke Canyon Dam near Three Rivers, Texas, to create Choke Canyon Reservoir, part of the water supply system for the City of Corpus Christi and surrounding area. The reach below Choke Canyon Reservoir travels a short distance to the Nueces River. This short reach comprises the upper portion of Segment 2106.

The Frio River is divided into four classified stream segments, one of those being Segment 2106, and one reservoir segment. Water quality monitoring for FY 2006 includes eight sites (includes one on Segment 2106) with at least one site on every segment. Each segment is discussed in more detail in the following sections, beginning with the most upstream segment and ending with the reservoir segment. Segment 2106 is included in the previous Nueces River section.

2113 – Upper Frio River



47 miles: from a point 100 m (110 yards) upstream of US 90 in Uvalde County to the confluence of the West Frio River and the East Frio River in Real County.

The segment is divided into two assessment units; the 25 miles surrounding SH 127 and the remainder of the segment.

2006 Monitoring 25 Miles Surrounding SH 127 13006 – At SH 127 East of Concan

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 13
Bacteria	4	
Flow	4	
Field	4	

Impairments

Depressed DO is listed as an impairment in the 25 miles surrounding SH 127. A TMDL has been conducted and the final report is available on the TCEQ website:

www.tceq.state.tx.us/assess/public/implementation/water/tmdl/31-2113upperfrioriverfinalreport-pchem.pdf.

The Executive Summary states: “Based upon the 24-hour DO data collected for this study, the Upper Frio River appears to be meeting the exceptional aquatic life use and should be removed from the states list of impaired waters.”

Concerns

There are no concerns in this segment.

Active Wastewater Permits

WQ0011683-001 – Alto Frio Baptist

Encampment: 20,000 gpd via irrigation of 2.0 acres of pasture land.

WQ0011962-001 – Garner SP: 60,000 gpd via irrigation of 20 acres of non-public access land.

2117 – Frio River Above Choke Canyon Reservoir

158 miles: from a point 4.2 km (2.6 miles) downstream of SH 16 in McMullen County to a point 100 m (110 yards) upstream of US 90 in Uvalde County.

The segment is divided into six assessment units; the lower 25 miles, from 2 miles downstream of SH 97 to 14 miles upstream of SH 97 crossing, 25 miles surrounding La Salle CR crossing north of SH 97, the 25 miles surrounding IH 35, the 25 miles surrounding FM 187, and the remainder of the segment.



2006 Monitoring

Lower 25 Miles

13023 – At SH 16 in Tilden

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

From 2 Miles Downstream of SH 97 to 14 Miles Upstream of SH 97 Crossing

18373 – Immediately Upstream of SH 97 North of Fowlerton

Parameter	Frequency	Agency
24hr DO	4	NRA
Conventional	4	
Bacteria	4	
Field	4	

2117 – Frio River Above Choke Canyon Reservoir (cont.)

25 Miles Surrounding IH 35

13024 – At US 35 North of Dilley

Parameter	Frequency	Agency
24hr DO	4	TCEQ Region 13
Conventional	4	
Bacteria	4	
Field	4	

25 Miles Surrounding FM 187

15449 – At FM 187 8 Mi. South of Sabinal

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 13
Bacteria	4	
Field	4	

Impairments

Bacteria is listed as an impairment in the lower 25 miles of the segment. It is also listed for bacteria, based on limited data, in the section from 2 miles downstream of SH 97 to 14 miles upstream of SH 97 crossing.

Depressed DO is listed as an impairment in the 25 miles surrounding La Salle county road crossing north of SH 97, in the 25 miles surrounding IH 35, from 2 miles downstream of SH 97 to 14 miles upstream of SH 97, and in the lower 25 miles of the segment.

The source(s) of these impairments are unknown. Additional data and information will be collected before a TMDL is scheduled.

Concerns

Chloride and TDS are listed as concerns in the entire segment. NRA received a phone call in early April 2006 from a man reporting that oil field brine was routinely being dumped into a tributary of the Frio River about a mile south of Dilley. NRA reported this to the TCEQ Region 13 office for investigation. The complaint was turned over to the Railroad Commission.

Depressed DO and bacteria are listed as concerns in the 25 miles surrounding IH 35.

Nitrate+nitrite nitrogen is listed as a concern in the 25 miles surrounding IH 35 and in the lower 25 miles of the segment.

Excessive algal growth is listed as a concern in the lower 25 miles of the segment.

2117 – Frio River Above Choke Canyon Reservoir (cont.)

The source(s) of these concerns are unknown. Routine sampling will be continued in order to collect additional data and information for future assessments.

Active Wastewater Permits

WQ0010360-001 – City of Pearsall

WQ0010404-002 – City of Dilley: 300,000 gpd: unnamed tributary of Cibolo Creek to Cibolo Creek to the Frio River.

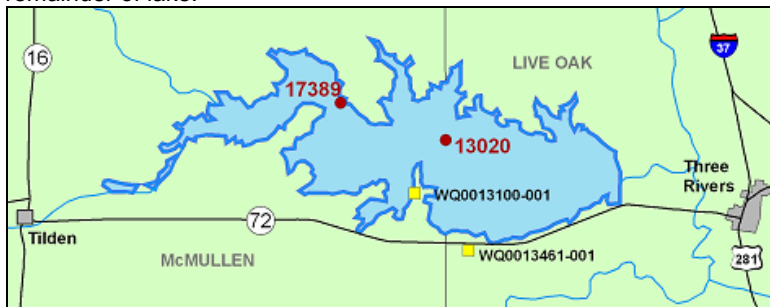
WQ0010404-003 – City of Dilley

WQ0013543-001 – McMullen County WCID No. 1 – Tilden Wastewater Treatment Plant (WWTP)

2116 – Choke Canyon Reservoir

26,000 acres: from Choke Canyon Dam in Live Oak County to a point 4.2 km (2.6 miles) downstream of SH 16 on the Frio River Arm in McMullen County and to a point 100 m (110 yards) upstream of the confluence of Mustang Branch on the San Miguel Creek Arm in McMullen County, up to the normal pool elevation of 220.5 feet (impounds Frio River).

The segment is divided into seven assessment units; 5120 acres near dam, small north arm of lake near dam and Willow Hollow Tank, 5120 acres in middle of lake, large north arm near mid lake and Jacob Oil Field, southern arm near mid lake and Rec. Road 7 west of Calliham, western end of lake to RR bridge, and remainder of lake.



2006 Monitoring

5120 Acres in Middle of Lake

13020 – Mid-lake on Live Oak/McMullen County Line.

Parameter	Frequency	Agency
Metals in Water	2	NRA
Conventional	4	
Bacteria	4	
Field	4	

2116 – Choke Canyon Reservoir (continued)

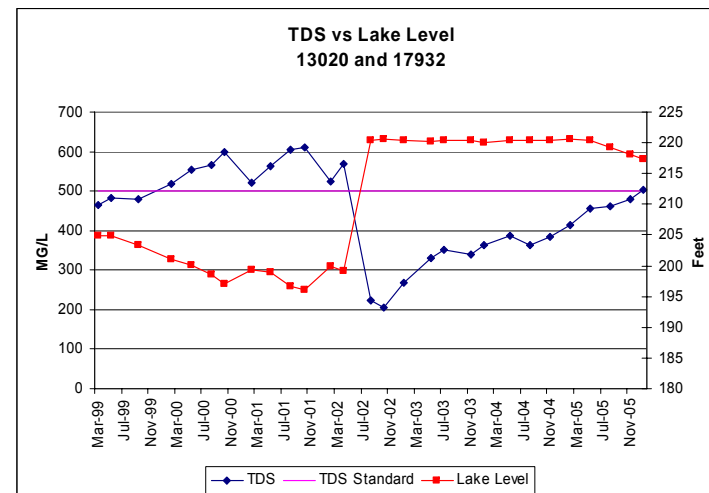
Western End of Lake up to RR Bridge

17389 – Approximately 0.5 km Southeast of RR 66 Southern Most Bridge Crossing the Frio River Arm

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

Impairments

The entire reservoir is listed as having an impairment for TDS with the majority of the data being collected during the drought of record for the area. The following graph uses data from stations 17392 from March 1999 – August 2000 and from 13020 from October 2000 to January 2006. At the time of writing of last year's report, the assumption was made that there was a direct relationship between TDS readings and the lake level. The data included values recorded through May 2004. This report includes data through January 2006. While TDS levels did drop significantly when the reservoir filled during the flood of July 2002, the TDS have continued to rise while the reservoir remained full. Other factors besides the lake level seem to affect the TDS levels. Segment 2117 just above the reservoir may be a contributor, as it has a concern for TDS. A standards review for parameter will be conducted before a TMDL is scheduled.



Bacteria is also listed as being an impairment throughout the reservoir, except for the 5120 acres near the middle of the lake. Segment 2117 may be a contributor, as it has also has an impairment for bacteria. Additional data and information will be collected before a TMDL is scheduled

2116 – Choke Canyon Reservoir (cont.)

Concerns

Depressed DO is listed as being a concern in the southern arm near mid lake and Rec. Road 7 west of Calliham and in the western end of the lake to RR bridge. Ten measurements were taken at station 17389 between August 2002 and October 2004. Four of the measurements did not meet the standard, so it is likely that the western end of the lake to RR bridge will remain listed after the 2006 Assessment. Segment 2117 may be a contributor, as it has an impairment for depressed DO. Routine sampling will be continued in order to collect additional data and information for future assessments.

Active Wastewater Permits

WQ0013100-001 – TPWD – Choke Canyon SP, Calliham Unit WWTP: 13,000 gpd via evaporation.

WQ0013461-001 – US Department of Justice – Federal Correctional Institution at Three Rivers: 300,000 gpd via irrigation of 82 acres of landscaping around the institute.

SABINAL RIVER

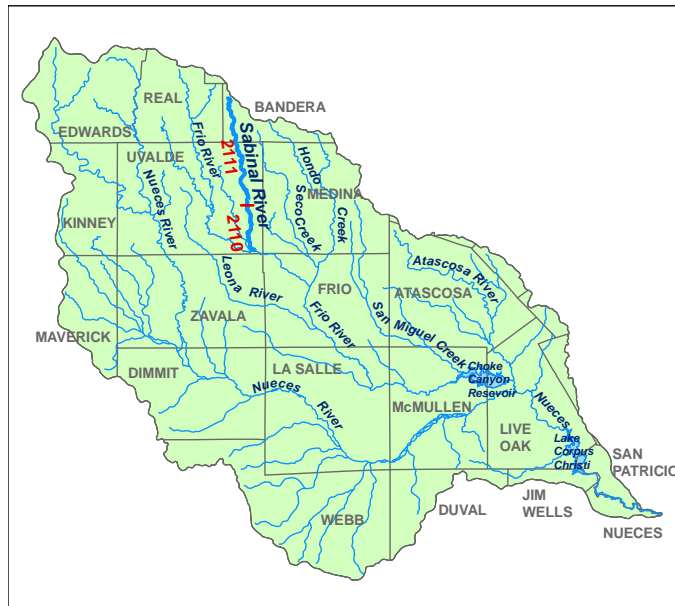


Figure 6. Sabinal River

The Sabinal River originates in Bandera County in the Texas Hill Country and terminates at its confluence with the Frio River in Uvalde County. The river crosses the Edwards Aquifer Recharge Zone in Uvalde County. During extended dry periods,

surface flows may disappear, but re-emerge at the town of Sabinal on US 90.

The Sabinal River is divided into two classified stream segments. Each segment is discussed in more detail in the following sections, beginning with the most upstream segment.

2111 – Upper Sabinal River



48 miles: from a point 100 m (110 yards) upstream of SH 127 in Uvalde County to the most upstream crossing of FM 187 in Bandera County.

2006 Monitoring

12994 – 12.5 Miles North of Sabinal and 2.3 Miles Downstream From the Mouth of Onion Creek

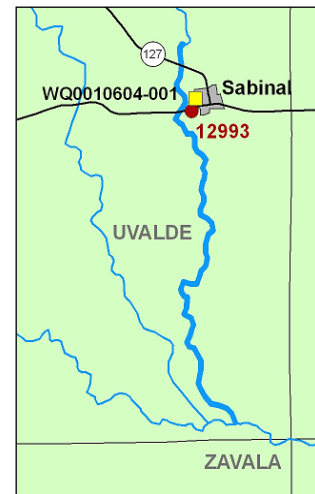
Parameter	Frequency	Agency
Conventional	4	TCEQ Region 13
Bacteria	4	
Field	4	

Impairments and Concerns

There are no impairments or concerns in this segment.

Active Wastewater Permits

WQ0011951-001 – TPWD – Lost Maples SP: 8,000 gpd via irrigation of 3.25 acres of non-public access grassland.



2110 – Lower Sabinal River

27 miles: from the confluence with the Frio River in Uvalde County to a point 100 m (110 yards) upstream of SH 127 in Uvalde County.

2006 Monitoring

12993 – Bridge on US 90 West Of Sabinal

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 13
Bacteria	4	
Field	4	

2110 – Lower Sabinal River (continued)

Impairments

Nitrate+nitrite nitrogen is listed as an impairment in this segment. A possible source of the nitrogen is the Sabinal WWTP. A TMDL is underway, the focus of which is to obtain grants to upgrade the plant and move it out of the 500 year flood plain. More information is available at

<http://www.tceq.org/assets/public/implementation/water/tmdl/45-sabinaltmdladopted.pdf>

Concerns

There are no concerns in this segment.

Active Wastewater Permits

WQ0010604-001 – City of Sabinal: 142,000 gpd: unnamed tributary of the Sabinal River to the Sabinal River.

2114 – HONDO CREEK

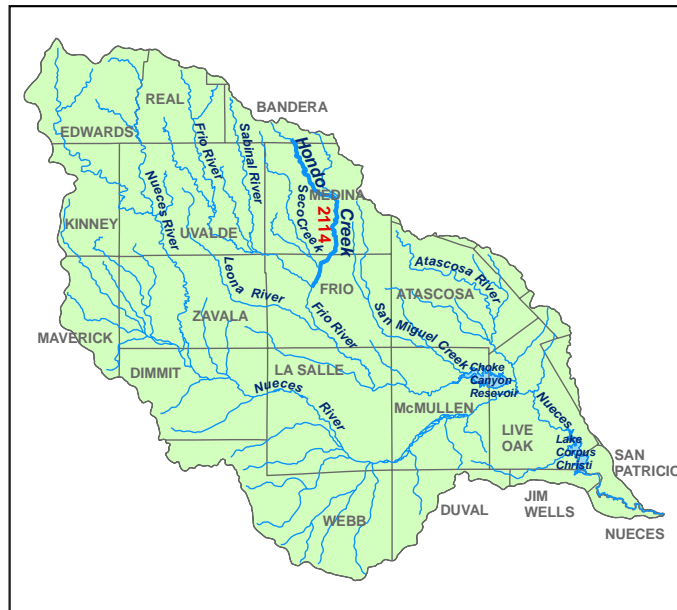


Figure 7.
Hondo Creek

Hondo Creek originates in Bandera County in the Texas Hill Country and terminates at its confluence with the Frio River in Frio County. During extended dry periods, surface flows may disappear, but re-emerge above US 90.

2114 – HONDO CREEK (continued)



78 miles: from the confluence with the Frio River in Frio County to FM 470 in Bandera County.

The segment is divided into two assessment units; the upper 25 miles and the lower 53 miles.

2006 Monitoring

Upper 25 Miles

13010 – Downstream From Bridge on Ranch Road 462 Near Tarpley

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 13
Bacteria	4	
Field	4	

Lower 53 Miles

18408 – Mid Channel Immediately

Downstream of SH 173 Southeast of Hondo

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 13
Bacteria	4	
Field	4	

Impairments and Concerns

There are no impairments or concerns in this segment.

Active Wastewater Permits

WQ0001645-000 – Hondo Vitreous China Plant Wastewater Treatment Facility: 30,000 gpd via evaporation.

WQ0010189-001 – City of Hondo: 1,800,000 gpd: Elm Slough to Hondo Creek.

2115 – SECO CREEK

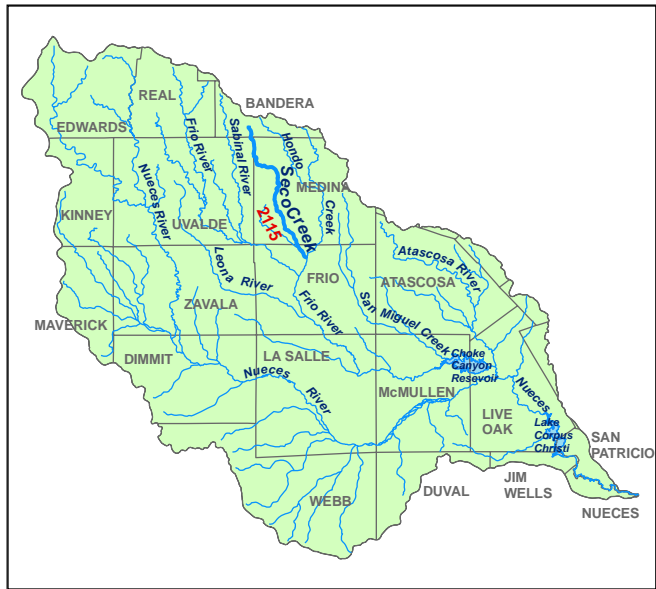
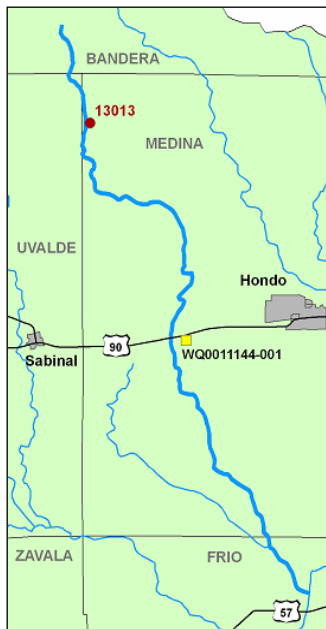


Figure 8. Seco Creek

Seco Creek originates in Bandera County in the Texas Hill Country and terminates at its confluence with Hondo Creek in Frio County. During extended dry periods, surface flows may disappear, but re-emerge above US 90.



70 miles: from the confluence with Hondo Creek in Frio County to the confluence of West Seco Creek in Bandera County.

The segment is divided into two sub-segments; the upper 25 miles and the lower 45 miles.

2006 Monitoring Upper 25 Miles

13013 – At Miller Ranch Near Utopia

Parameter	Frequency	Agency
24hr DO	2	TCEQ Region 13
Conventional	4	
Bacteria	4	
Field	4	

Impairments

There are no impairments in this segment.

Concerns

Temperature is listed as a concern in the upper 25 miles of the segment. The elevated

temperatures are most likely the result of natural causes.

2115 – SECO CREEK (continued)

Active Wastewater Permits

WQ0011144-001 – Medina County WCID 002: 80,000 gpd.

2109 –LEONA RIVER

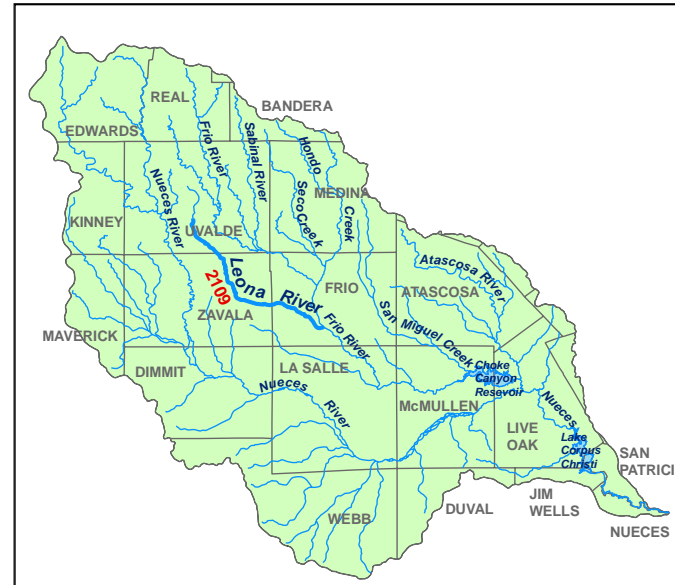


Figure 9. Leona River
The Leona River originates in Uvalde County in the Texas Hill Country and terminates at its confluence with the Frio River in Frio County.



85 miles: from the confluence with the Frio River in Frio County to US 83 in Uvalde County.

2109 –LEONA RIVER (continued)

2006 Monitoring

12985 – At FM 1581 Southwest of Pearsall

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 13
Bacteria	4	
Field	4	

12987 – At Hwy 57 Near Batesville

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 13
Bacteria	4	
Field	4	

12989 – At Hoags Dam (Upstream Side) (Ft. Inge)

Parameter	Frequency	Agency
Fish Tissue	2	TCEQ Region 13
Organics in Sediment	2	
Metals in Sediment	2	
Conventional	4	
Bacteria	4	
Field	4	

18418 – 370M Upstream of FM 140

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

Impairments

There are no impairments in this segment.

Concerns

Nitrate+nitrite nitrogen is identified as a concern. Beginning April 2003, the analysis for nitrogen switched from nitrate+nitrite to nitrate and nitrite separately, nitrate being the primary parameter of concern.

Review of the nitrate data that will be available for the 2006 Assessment indicates that the nitrate concentration increases downstream. Nitrite was not detected in any of the samples.

Sulfate is also identified as a concern.

The source(s) of these concerns are unknown. Routine sampling will be continued in order to collect additional data and information for future assessments.

2109 –LEONA RIVER (continued)

Recently, increased bacteria levels have been recorded in this segment and will continue to be monitored.

Active Wastewater Permits

WQ0002752-000 – TAFMI, Inc., Agrilink Foods: 250,000,000 gallons per year via irrigation. The facility is currently not in operation.

WQ0010306-001 – City of Uvalde

2108 – SAN MIGUEL CREEK



Figure 10. San Miguel Creek

San Miguel Creek originates in Frio County in the Texas Hill Country and terminates in Choke Canyon Reservoir in McMullen in Frio County.

2006 Monitoring

Lower 25 Miles

12983 – At SH 16 North of Tilden

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

2107 – ATASCOSA RIVER (continued)

2006 Monitoring

Lower 25 Miles

12980 – At FM 99 Bridge West of Whitsett

Parameter	Frequency	Agency
24hr DO	4	NRA
Conventional	4	
Bacteria	4	
Flow	4	
Field	4	

25 Miles Surrounding US 281

12982 – At US 281 at Pleasanton

Parameter	Frequency	Agency
24hr DO	4	TCEQ Region 13
Conventional	4	
Bacteria	4	
Flow	4	
Field	4	

Impairments

Bacteria is listed as an impairment in the lower 25 miles of the segment and in the 25 miles surrounding US 281. Depressed DO is also listed as an impairment in the 25 miles surrounding US 281. A TMDL for both parameters has been conducted. The Executive Summary of the Final Report states:

“Eleven of the 39 24-hour dissolved oxygen samples collected in the Atascosa River had an average value that was below the TCEQ average criteria of 5 mg/L, and 1 sample was below the TCEQ minimum criteria of 3 mg/L associated with a “high aquatic life use”. A total of 13 of the 38 e-coli samples collected exceeded the single sample exceedance criteria (394 col/100mL) associated with contact recreation use, and three of the four stations sampled yielded e-coli geometric means that exceeded the criteria (126 col/100mL) set by TCEQ for contact recreation. As a result of these findings, the Atascosa River will remain on the 303(d) List of impaired waters due to non-support of contact recreation due to elevated levels of bacteria in the stream. A TMDL will be established for this watershed. The next phase of the project will involve storm event based monitoring for physical and chemical parameters of the stream as well as numerical water quality model selection and development.”

More information on the TMDL is available at http://www.tceq.state.tx.us/implementation/water/tmdl/31-sc_bacox_project.html.

2107 – ATASCOSA RIVER (continued)

Concerns

Ammonia and excessive algal growth are listed as concerns in the 25 miles surrounding US 281 and TDS is listed as a concern for the entire segment.

The source(s) of these concerns are unknown. Routine sampling will be continued in order to collect additional data and information for future assessments.

Active Wastewater Permits

WQ0002043-000 – San Miguel Electric Cooperative: 62,000 gpd via evaporation and mine pit water and storm water runoff on an intermittent and flow variable basis via nine outfalls. Outfalls 001A – 001M discharge to Caballos Creek, Souse Creek, La Parita Creek, Christine Creek, and Metate Creek, and/or their tributaries; to the Atascosa River. (Outfall 002 discharges to San Miguel Creek, Segment 2108.)

WQ0002601-000 – San Miguel Electric Cooperative

WQ0010096-001 – City of Lytle: 450,000 gpd: West Prong Atascosa River to Atascosa River.

WQ0010418-001 – City of Jourdanton: 330,000 gpd: unnamed tributary of Goose Creek to Goose Creek to La Parita Creek to Metate Creek to the Atascosa River.

WQ0010598-001 – City of Pleasanton

WQ0013630-001 – City of Poteet

WQ0014265-001 – Benton City WSC: 15,000 gpd: unnamed tributary to the Atascosa River.

San Antonio – Nueces Coastal Basin

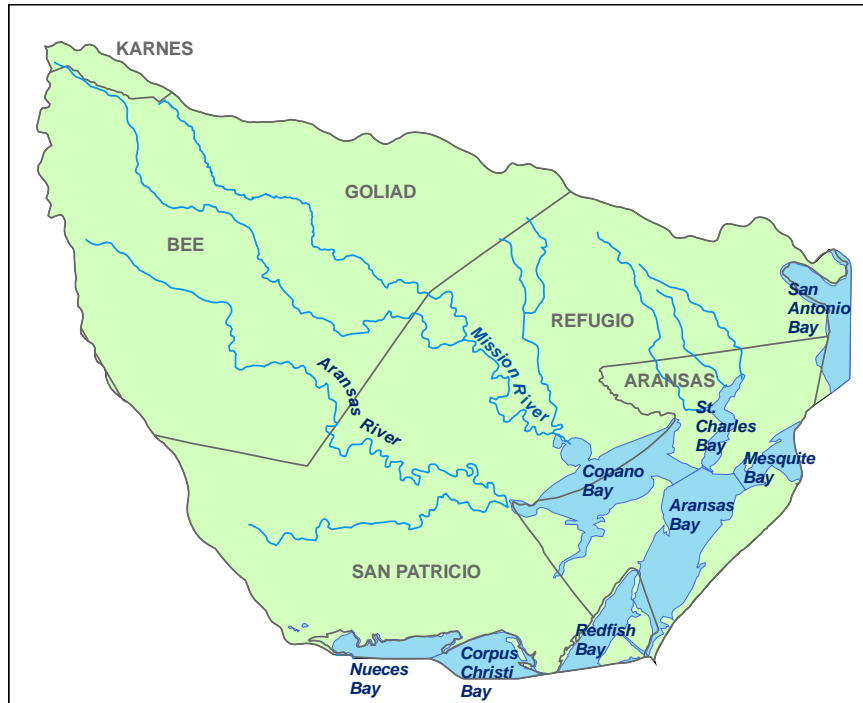


Figure 12. San Antonio – Nueces Coastal Basin

The San Antonio – Nueces Coastal Basin is approximately 3,100 square miles, covering all or part of 7 counties. The basin is bordered by the San Antonio River Basin to the north, the Lavaca-Guadalupe Coastal Basin to the northeast, bays, estuaries, and the Gulf of Mexico to the east, the Nueces-Rio Grande Coastal Basin to the south, and the Nueces River Basin to the northwest. Being a coastal area, the basin is naturally host to several state-operated recreational areas. These include Goose Island SP near Rockport, Copano Bay State Fishing Pier along State Highway 35 north of Fulton, Fulton Mansion SHP in Fulton, and the Aransas National Wildlife Refuge in Aransas County.

There are four stream segments in the basin. Water quality monitoring for FY 2006 includes four sites with one site on every segment. All of the segments will be discussed in detail in the following sections.

Table 3. Assessment Summary for the San Antonio – Nueces Coastal Basin

Segment	Description	Concerns	Impairments	TMDL
2001	Mission River Tidal		Bacteria	Copano Bay Bacteria
2002	Mission River Above Tidal	Depressed DO		
2003	Aransas River Tidal	Orthophosphorus	Bacteria	Copano Bay Bacteria
2004	Aransas River Above Tidal	Upper 25 miles	Depressed DO	

Table 4. FY 2006 Monitoring Stations for the San Antonio – Nueces Coastal Basin

Segment	Station ID	Station Description
2001	12943	Mission River Tidal at FM 2678 Bridge between Refugio and Bayside
2002	12944	Mission River Above Tidal at US 77-upstream from bridge at Refugio
2003	12947	Aransas River Tidal at boat ramp on FM 629 south of Bonnie View
2004	12952	Aransas River Above Tidal at County Road East of Skidmore

MISSION RIVER

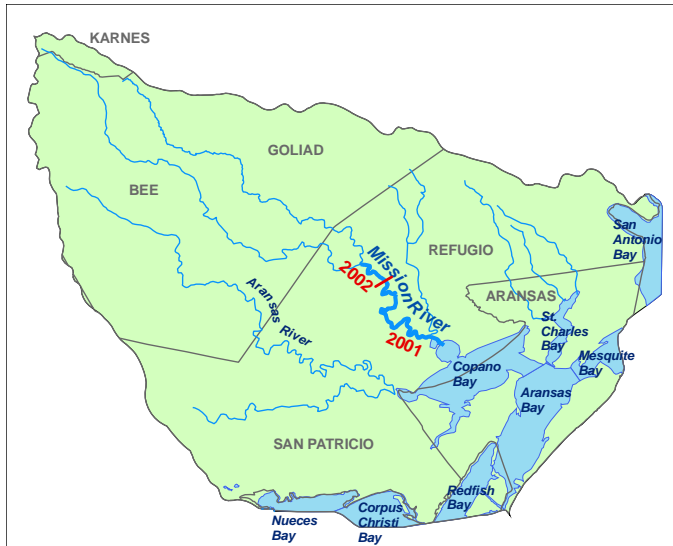


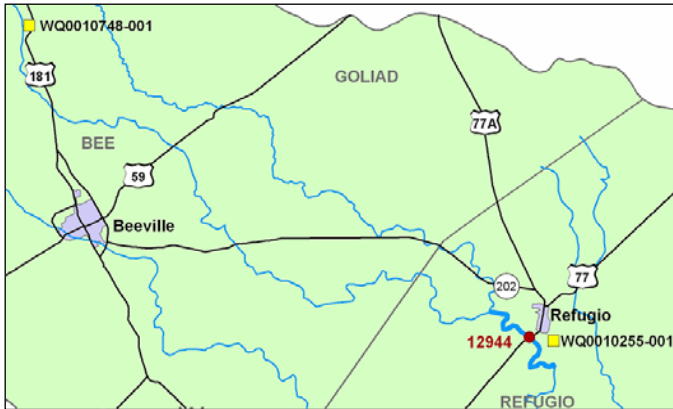
Figure 13. Mission River
The Mission River originates in Refugio County and terminates in Mission Bay in Refugio County.

The Mission River is divided into two classified stream segments.

Each segment is discussed in more detail in

the following sections, beginning with the most upstream segment.

2002 – Mission River Above Tidal



9 miles: from a point 7.4 km (4.6 miles) downstream of US 77 in Refugio County to the confluence of Blanco Creek and Medio Creek in Refugio County.

2006 Monitoring

12944 – US 77-upstream from bridge at Refugio

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

2002 – Mission River Above Tidal (continued)

Impairments

There are no impairments in this segment.

Concerns

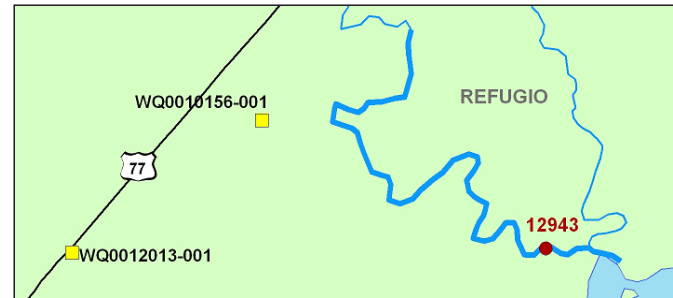
Depressed DO is listed as a concern for this segment. The 24 hour DO monitoring has been completed and all ten of the results meet the standard. Therefore, this segment should be removed from the 303(d) list after the 2006 Assessment.

Active Wastewater Permits

WQ0010255-001 – Town of Refugio

WQ0010748-001 – Pettus MUD: 105,000 gpd: Medio Creek to Mission River Above Tidal.

2001 – Mission River Tidal



19 miles: from the confluence with Mission Bay in Refugio County to a point 7.4 km (4.6 miles) downstream of US 77 in Refugio County.

2006 Monitoring

12943 – FM 2678 Bridge between Refugio and Bayside

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

Impairments

Bacteria is listed as an impairment in this segment. This segment is included in a TMDL to address bacteria in oyster-harvesting waters in Copano Bay. A discussion of the TMDL is included in the Copano Bay summary of Page 44 of this report.

Concerns

There are no concerns in this segment.

2001 – Mission River Tidal (continued)

Active Wastewater Permits

WQ0010156-001 – Town of Woodsboro: 250,000 gpd: a ditch to Willow Creek to Sous Creek to Mission River Tidal.

WQ0012013-001 – Texas Department of Transportation (TxDOT): - Refugio County Rest Area: 3,200 gpd via evaporation in a 0.086 acre pond and irrigation of 1.5 acres of highway right-of-way land.

ARANSAS RIVER

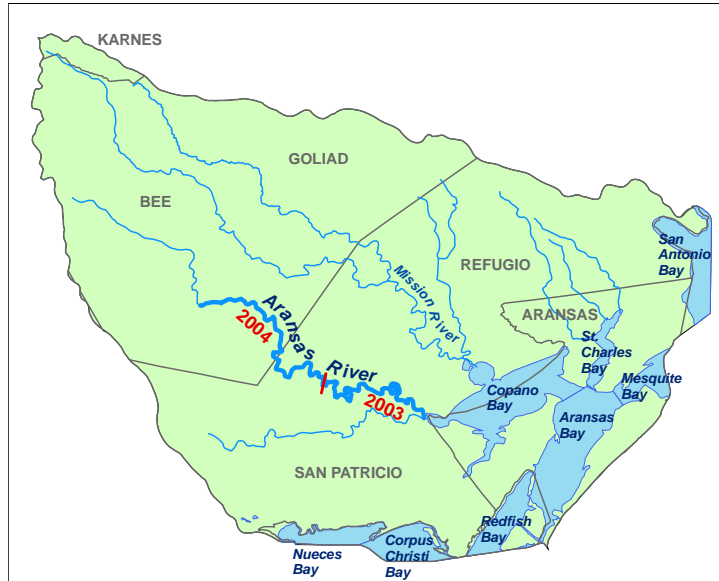


Figure 14. Aransas River

The Aransas River originates in Bee County and terminates in Copano Bay in Aransas County.

The Aransas River is divided into two classified stream segments. Each segment is discussed in more detail in the following sections, beginning with the most upstream segment.

2004 – Aransas River Above Tidal



35 miles: from a point 1.6 km (1.0 mile) upstream of US 77 in Refugio/San Patricio County to the confluence of Poesta Creek and Aransas Creek in Bee County.

This segment is divided into two assessment units; the upper 18 miles and the lower 17 miles.

2006 Monitoring

12952 – At County Road East of Skidmore

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

Impairments

There are no impairments on this segment.

Concerns

The 2002 Assessment listed the upper 25 miles as having a concern for depressed DO. After the assessment, it was discovered that beginning in August 1998, samples were being taken on Aransas Creek, an intermittent stream, not the Aransas River. The incorrect location was assigned a new SWQM number and assigned to those sampling results. The correct location has been sampled since July 2002, but there were only 3 grab samples available for the 2004 Assessment. Two of the ten samples available for the 2006 Assessment do not meet the standard. Ten 24 hour DO measurements will be needed in order to determine if there is an actual depressed DO problem.

2004 – Aransas River Above Tidal (continued)

Active Wastewater Permits

WQ0010124-002 – City of Beeville: 3,000,000 gpd with provisions for irrigation of the grass and landscaping of the plant site: to Poesta Creek to the Aransas River Above Tidal.

WQ0010124-004 – City of Beeville, Chase Field: 2,500,000 gpd.

WQ0014112-001 – Skidmore WSC

WQ0014123-001 – Tynan WSC: 45,000 gpd: Papalote Creek to the Aransas River Above Tidal.

2003 – Aransas River Tidal



6 miles: from the confluence with Copano Bay in Aransas/Refugio County to a point 1.6 km (1.0 mile) upstream of US 77 in Refugio/San Patricio County.

2006 Monitoring

12947 – At boat ramp on FM 629 south of Bonnie View

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

Impairments

Bacteria is listed as an impairment in this segment. This segment is included in a TMDL to address bacteria in oyster-harvesting waters in Copano Bay. A discussion of the TMDL is included in the Copano Bay summary of Page 44 of this report.

2003 – Aransas River Tidal (continued)

Concerns

The 2004 assessment lists this segment as having a concern for orthophosphorus. Beginning in FY 2004, orthophosphorus samples were required to be filtered in the field immediately after collection, and this parameter was dropped from the analysis.

Trend analysis for the data from March 1996 (beginning of 2002 Assessment) through August 2003 shows a decreasing trend in the orthophosphorus values.

The orthophosphorus data was reviewed at the FY 2006 Coordinated Monitoring Meeting and a decision was made to resume sampling for orthophosphorus at this location.

Active Wastewater Permits

WQ0010055-001 – City of Sinton: 15,000 gpd: San Patricio County Drainage District ditch to an unnamed tributary of Chiltipin Creek to Chiltipin Creek to Aransas River Tidal.

WQ0010237-001 – City of Odem

WQ0013412-001 – TxDOT: 380 gpd: Oliver Drainage Ditch to an unnamed tributary to Chiltipin Creek to Aransas River Tidal.

WQ0013641-001 – City of Sinton Rob and Bessie Welder Park: 15,000 gpd: San Patricio County Drainage District ditch to an unnamed tributary of Chiltipin Creek to Chiltipin Creek to Aransas River Tidal.

WQ0014119-001 – St. Paul WSC: 50,000 gpd: unnamed tributary to Chiltipin Creek to the Aransas River Tidal.

Nueces – Rio Grande Coastal Basin



Figure 15. Nueces – Rio Grande Coastal Basin

The Nueces – Rio Grande Coastal Basin covers approximately 10,400 square miles, encompassing all or part of 12 counties in South Texas. The basin is bordered by the Nueces River Basin and the San Antonio – Nueces Coastal Basin to the north, bays, estuaries, and the Gulf of Mexico to the east, and the Rio Grande River Basin to the south and southwest. The inland area of the basin is dominated by large ranches, including the King Ranch. State-operated recreational areas are primarily along the coast and include Mustang Island SP, Port Isabelle Light House SHP in Port Isabel, and the Padre Island National Seashore.

There are five stream segments and one reservoir segment in the basin. Water quality monitoring for FY 2006 includes 13 sites with at least one site on every segment except the reservoir segment. All of the segments will be discussed in detail in the following sections.

Table 5. Assessment Summary for the Nueces – Rio Grande Coastal Basin

Segment	Description		Concerns	Impairments	TMDL
2201	Arroyo Colorado Tidal	3 miles upstream to 2 miles downstream of Marker 27	Nitrate+nitrite nitrogen		Arroyo Colorado WPP
		1 mile upstream to 3 miles downstream of Camp Perry	Nitrate+nitrite nitrogen	Depressed DO	
		Upper 4 miles	Nitrate+nitrite nitrogen Ammonia	Depressed DO	
2202	Arroyo Colorado Above Tidal	Lower 4 miles	Ammonia Orthophosphorus Total phosphorus Excessive algal growth Nitrate+nitrite nitrogen	Bacteria Chlordane, DDE, and toxaphene in small mouth buffalo	Arroyo Colorado WPP & Arroyo Colorado Legacy Pollutants and Organics
		11 miles upstream to 4 miles downstream of US 77	Nitrate+nitrite nitrogen	Bacteria Chlordane, DDE, and toxaphene in small mouth buffalo	
		14 miles upstream to 11 miles downstream of FM 1015	Ammonia Orthophosphorus Total phosphorus Excessive algal growth Nitrate+nitrite nitrogen	Bacteria Chlordane, DDE, and toxaphene in small mouth buffalo	
		Upper 19 miles	Ammonia Orthophosphorus Total phosphorus Excessive algal growth Nitrate+nitrite nitrogen	Bacteria Chlordane, DDE, and toxaphene in small mouth buffalo	
2202A	Donna Reservoir			PCBs in fish tissue	Arroyo Colorado WPP & Arroyo Colorado Legacy Pollutants and Organics
2203	Petronila Creek Tidal		Excessive algal growth	Temperature	
2204	Petronila Creek Above Tidal		Excessive algal growth	Chloride, Sulfate, TDS	South Central Texas Bacteria and DO
2485A	Oso Creek	Lower 25 Miles	Orthophosphorus Total phosphorus Nitrate+nitrite nitrogen	Bacteria	Oso Bay and Oso Creek Bacteria

Table 6. FY 2006 Monitoring Stations for the Nueces – Rio Grande Coastal Basin

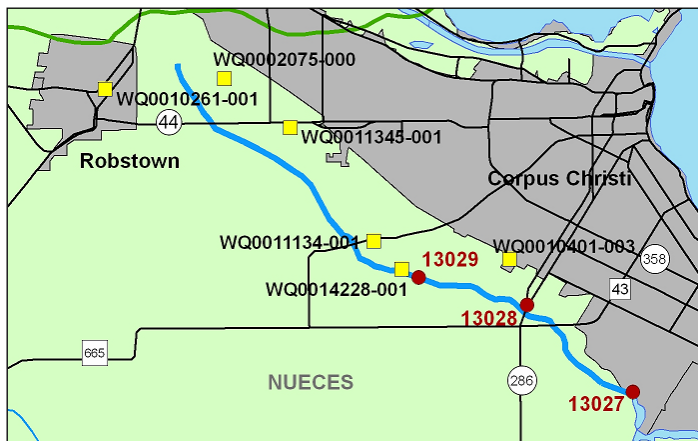
Segment	Station ID	Station Description
2201	13072	Arroyo Colorado Tidal FM 106 Bridge at Rio Hondo
	13073	Arroyo Colorado Tidal At Camp Perry North of Rio Hondo
	13559	Arroyo Colorado Tidal At Marker 27 (Mile 15) 0.5 Mile North of the Point Where Channel Becomes Boundary Between Willacy And Cameron Counties
	13782	Arroyo Colorado Tidal Near CM 16 at Arroyo City, KM 10.9
2202	13074	Arroyo Colorado Above Tidal At Low Water Bridge at Port Harlingen
	13081	Arroyo Colorado Above Tidal Main Floodway In Llano Grande At Fm 1015 South Of Weslaco
	13084	Arroyo Colorado Above Tidal At US 281 South Of Pharr
2203	13090	Petronila Creek Tidal 1.2 2 Km Upstream of the Confluence With Tunas Creek
2204	13094	Petronila Creek Above Tidal At FM 892 Southeast of Driscoll
2485A	13027	At FM 2444 South of Corpus Christi
	13028	At SH 286 South of Corpus Christi
	13029	At FM 763 Southwest of Corpus Christi
2492A	13033	At US 77 Bypass in Kingsville

2485A – OSO CREEK



Figure 16. Oso Bay

Oso Creek originates in Nueces County and terminates in Oso Bay in Nueces County.



29.5 miles: from the confluence with Oso Bay in southern Corpus Christi to a point 3 miles upstream of SH 44, west of Corpus Christi in Nueces County.

2485A – Oso Creek (continued)

The segment is divided into two assessment units; the lower 25 miles and the upper 4.5 miles.

2006 Monitoring

Lower 25 Miles

13027 – At FM 2444 South of Corpus Christi

Parameter	Frequency	Agency
Bacteria	12	TCEQ TMDL (A&M – CC)
Flow	12	
Field	12	
Bacteria	2	Rainfall Event TCEQ TMDL (A&M – CC)
Flow	2	
Field	2	

13028 – At SH 286 South of Corpus Christi

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	
Bacteria	12	TCEQ TMDL (A&M – CC)
Flow	12	
Field	12	
Bacteria	2	Rainfall Event TCEQ TMDL (A&M – CC)
Flow	2	
Field	2	

13029 – At FM 763 Southwest of Corpus Christi

Parameter	Frequency	Agency
Bacteria	12	TCEQ TMDL (A&M – CC)
Flow	12	
Field	12	
Bacteria	2	Rainfall Event TCEQ TMDL (A&M – CC)
Flow	2	
Field	2	

Impairments

The lower 25 miles has an impairment for bacteria. This segment is included in the TMDL discussed in the write up for Segment 2485 on Page 52.

Concerns

The lower 25 miles has concerns for nitrate+nitrite nitrogen, orthophosphorus, and total phosphorus.

2485A – Oso Creek (continued)

The source(s) of these concerns are unknown. Routine sampling will be continued in order to collect additional data and information for future assessments.

The Coastal Bend Council of Governments (CBCOG) is currently working on a proposal to combine public education and outreach with actual clean ups in an effort to reduce illegal dumping in Oso Creek, Oso Bay, and Petronila Creek.

Active Wastewater Permits

WQ0002075-000 – Equistar Chemicals LP: 2,000,000 gpd.

WQ0010261-001 – City of Robstown: 3,000,000 gpd: unnamed ditch to Oso Creek.

WQ0010401-003 – City of Corpus Christi – Greenwood Plant

WQ0011134-001 – Corpus Christi Peoples Baptist Church: 20,000 gpd.

WQ0011345-001 – Texas A&M University System Agricultural Research and Extension Center

WQ0014228-001 – Tennessee Pipeline Construction (Cudahy Field): 3,000,000 gpd.

PETRONILA CREEK



Figure 17. Petronila Creek

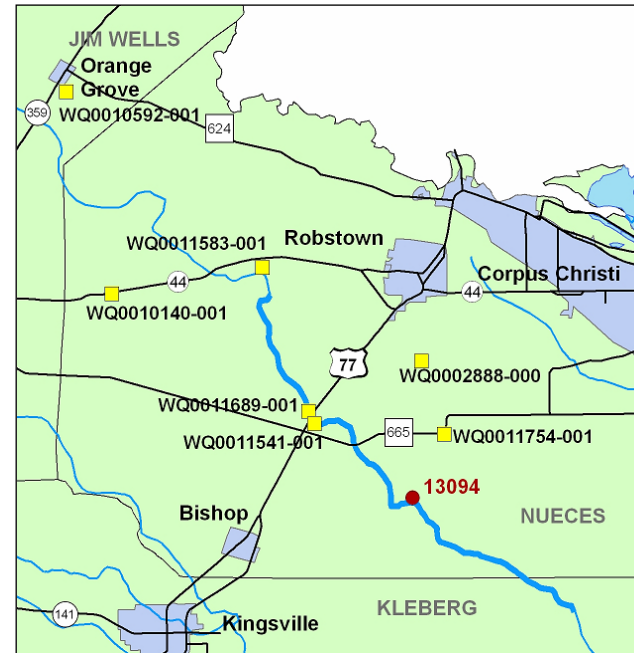
Petronila Creek originates in Nueces County and terminates in Alazan Bay, an arm of Baffin Bay, in Kleberg County.

Petronila Creek is divided into two classified stream segments. Each segment is discussed in more detail in the following sections, beginning with the most upstream segment.

2204 – Petronila Creek Above Tidal

44 miles: from a point 1 km (0.6 miles) upstream of private road crossing near Laureles Ranch in Kleberg County to the confluence of Agua Dulce and Banquete Creeks in Nueces County.

The segment is divided into two sub-segments, the lower 25 miles and the upper 19 miles of the segment.



2006 Monitoring Lower 25 Miles 13094 – At FM 892 Southeast of Driscoll

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Flow	4	
Field	4	

Impairments

This segment has impairments for chloride, sulfate, and TDS. A TMDL is underway. The data collection phase of the project is complete. The data results collected under baseline, runoff, and storm event flows are being studied to qualify the suspected sources: groundwater migration/geology; non-compliant saltwater injection, oil, and gas wells; and agriculture.

An airborne geophysical survey was conducted to try and pinpoint the source or sources of the high concentrations of chloride, sulfate, and TDS.

More information can be found at

http://www.tceq.org/implementation/water/tmdl/32-colorado_petronila.html.

2204 – Petronila Creek Above Tidal (continued)

Concerns

Excessive algal growth has been identified as a concern in the lower 25 miles of the segment. The source(s) of this concern is unknown. Routine sampling will be continued in order to collect additional data and information for future assessments. It has been observed that the downstream tidal segment, Baffin Bay, and the Laguna Madre at the mouth of Baffin Bay also have concerns for excessive algae growth.

This segment is included in the CBCOG clean up project.

Active Wastewater Permits

WQ0002888-000 – US Ecology Texas: storm water discharge at an intermittent and flow variable rate via four outfalls: a Nueces County Drainage Ditch to Petronila Creek Above Tidal.

WQ0010140-001 – City of Agua Dulce: 160,000 gpd: drainage ditch to Agua Dulce Creek to Petronila Creek Above Tidal.

WQ0010592-001 – City of Orange Grove: 200,000 gpd: Leon Creek to Quinta Creek to Agua Dulce Creek to Petronila Creek Above Tidal.

WQ0011541-001 – City of Driscoll: 100,000 gpd.

WQ0011583-001 – Nueces County WCID No. 5: 160,000 gpd: Banquete Creek to Petronila Creek Above Tidal.

WQ0011754-001 – Bishop Consolidated Independent School District (ISD): 15,000 gpd: unnamed ditch to Petronila Creek Above Tidal.

WQ0011689-001 – Coastal Bend Youth City: 8,000 gpd: unnamed ditch to Petronila Creek Above Tidal.

2203 – Petronila Creek Tidal



14 miles: from the confluence of Chiltipin Creek in Kleberg County to a point 1 km (0.6 miles) upstream of private road crossing near Laureles Ranch in Kleberg County.

2006 Monitoring

13090 – 1.2 2 Km Upstream of the Confluence With Tunas Creek

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Impairments

Temperature was identified as an impairment in the 2002 Assessment. However, it has been determined that the elevated temperatures are due to natural causes.

Concerns

Excessive algal growth was identified as a concern. Station 13090 was not monitored from November 2001 through August 2004 due to inaccessibility onto the King Ranch. The station was added back to the monitoring schedule for FY 2005 in order to properly evaluate the chlorophyll a. It has been observed that the upstream segment, downstream Baffin Bay, and the Laguna Madre at the mouth of Baffin Bay also have concerns for excessive algae growth.

Active Wastewater Permits

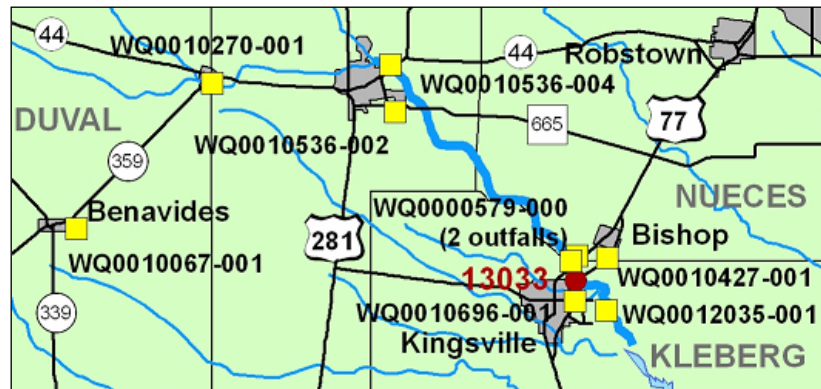
There are no active wastewater permits that discharge in this segment.

2492A – SAN FERNANDO CREEK



Figure 18. San Fernando Creek

San Fernando Creek originates in Jim Wells County and terminates in Cayo Del Grullo, an arm of Baffin Bay in Kleberg County.



45.6 miles: from the confluence with the Cayo del Grullo arm of Baffin to just east of the Nueces and Jim Wells county line.

The segment is divided into two assessment units; 25 miles upstream of the confluence with Cayo del Grullo and the remainder of the creek.

2492A – SAN FERNANDO CREEK (continued)

2006 Monitoring Remainder of Creek

13033 – At US 77 Bypass Bridge at Kingsville

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Flow	4	
Field	4	

Impairments and Concerns

There are no impairments or concerns on this segment.

Active Wastewater Permits

WQ0000579-000 – Ticona Polymers, Inc.

WQ0010067-001 – Duval County Conservation and Reclamation District: 250,000 gpd: Santa Gertrudis Creek to San Fernando Creek.

WQ0010270-001 – San Diego MUD: 750,000 gpd: San Diego Creek to San Fernando Creek.

WQ0010427-001 – City of Bishop: 320,000 gpd: Carreta Creek to San Fernando Creek.

WQ0010536-002 – City of Alice: 2,600,000 gpd: Lattas Creek to San Fernando Creek.

WQ0010536-004 – City of Alice: 2,020,000 gpd. Also authorizes the disposal of treated domestic wastewater via irrigation of a total of 164 acres which include the municipal golf course, softball fields, and park acreage.

WQ0010696-001 – City of Kingsville – Plant 1: 3,000,000 gpd: Tranquitas Creek to San Fernando Creek.

WQ0010696-004 – City of Kingsville (Not plotted on Map)

WQ0012035-001 – US Department of the Navy (Kingsville Naval Air Station (NAS)): 40,000 gpd.

ARROYO COLORADO



Figure 19. Arroyo Colorado

The Arroyo Colorado is an ancient distributary channel of the Rio Grande, extending 90 miles from Mission, Texas to the Laguna Madre. The Arroyo Colorado WPP is being developed in an effort to reduce loadings of nutrients, biochemical oxygen demand, and suspended solids flowing

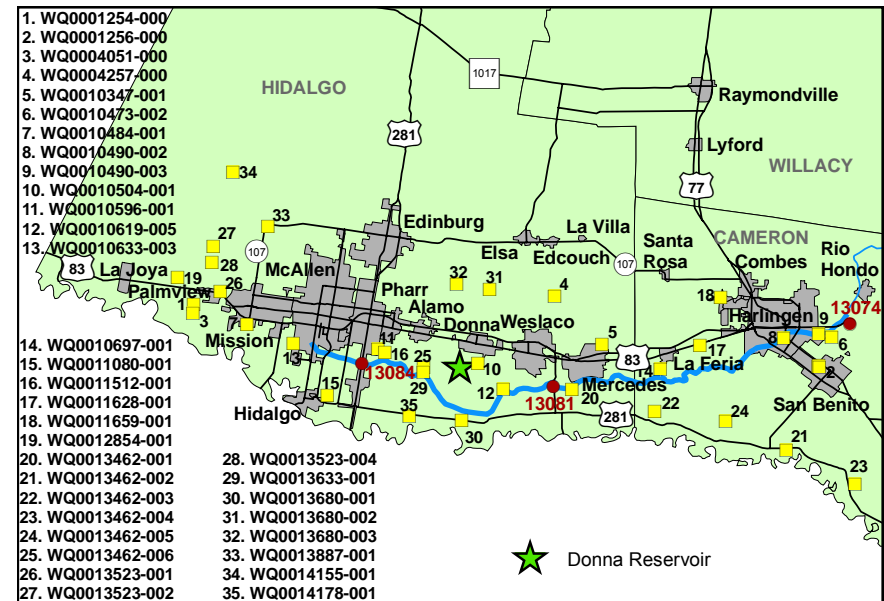
into the Arroyo Colorado. A major component of the WPP is an effort to reduce the amount of domestic and municipal wastewater that enters the Arroyo Colorado. The plan includes measures for institutional controls (i.e. changes in permits), wastewater infrastructure improvements that are designed to mitigate nonpoint sources of pollution and to improve current wastewater treatment levels, and enhanced biological treatment projects such as reuse via irrigation, polishing ponds, and constructed wetland cells.

The WPP encompasses the entire Arroyo Colorado watershed and all potential pollutants, not just the identified concerns and impairments. Implementation of the WPP is expected in 2006. More information is available at <http://www.tceq.state.tx.us/implementation/water/tmdl/arroyo.html>.

2202 – Arroyo Colorado Above Tidal

63 miles: from a point 100 m (110 yards) downstream of Cemetery Road south of Port Harlingen in Cameron County to FM 2062 in Hidalgo County.

The segment is divided into four sub-segments, the lower 4 miles, approximately 11 miles upstream to approximately 4 miles downstream of US 77, approximately 14 miles upstream to approximately 11 miles downstream of FM 1015, and the upper 19 miles of the segment.



2006 Monitoring

13074 – At Low Water Bridge at Port Harlingen

Parameter	Frequency	Agency
24hr DO	2	NRA
Metals in Sediment	2	TCEQ Region 15
Organics in Sediment	2	
Conventional	4	
Bacteria	4	
Field	4	

2202 – Arroyo Colorado Above Tidal (continued)

13081 – Main Floodway In Llano Grande At Fm 1015 South Of Weslaco

Parameter	Frequency	Agency
24hr DO	2	NRA
Conventional	4	TCEQ Region 15
Bacteria	4	
Field	4	

13084 – At US 281 South Of Pharr

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 15
Bacteria	4	
Flow	4	
Field	4	

Impairments

Bacteria has been identified as an impairment in the entire segment. This impairment is being addressed by the Arroyo Colorado WWP.

The United States Environmental Protection Agency (EPA) has approved a TMDL for chlordane, DDE, and toxaphene in smallmouth buffalo. All the other organic compounds (DDD, DDE, DDT, dieldrin, endrin, heptachlor epoxide, heptachlor, hexachlorobenzene, lindane) in the fish tissue have been removed from the list. More information is available at <http://www.tceq.state.tx.us/implementation/water/tmdl/07-arroyoleg.html>.

Concerns

Ammonia, orthophosphorus, total phosphorus, and excessive algal growth are concerns in all but the 11 miles upstream to 4 miles downstream of US 77 sub-segment.

Nitrate+nitrite nitrogen is listed as a concern for the entire segment.

These concerns are being addressed by the Arroyo Colorado WWP.

Active Wastewater Permits

WQ0001254-000 – CPL Bate Facility: 2,000,000 gpd: Hidalgo County Drainage Ditch to the Arroyo Colorado Above Tidal.

WQ0001256-000 – CPL La Palma Power Station: 1,120,000 gpd: Cameron County Drainage Ditch to the Arroyo Colorado Above Tidal.

WQ0004051-000 – Frontera Generation Ltd.: 1,240,000 gpd: Hidalgo County Drainage Ditch to the Main Floodway to Arroyo Colorado Above Tidal.

WQ0004257-000 – Watermill Express: 1,000 gpd via a subsurface drainfield with an area of approximately 7,000 square feet.

2202 – Arroyo Colorado Above Tidal (continued)

WQ0004754-000 – Military Highway WSC Progresso Water Treatment Plant: 2,300,000 gpd: Progresso Main Canal to Llano Grande Lake - part of the Arroyo Colorado Above Tidal. (Not plotted on map.)

WQ0010347-001 – City of Mercedes: 520,000 gpd: unnamed drainage ditch to Arroyo Anacuitas to Arroyo Colorado Above Tidal.

WQ0010473-002 – City of San Benito: 2,160,000 gpd.

WQ0010484-001 – City of Mission: 9,000,000 gpd.

WQ0010490-002 – Harlingen Water Works Facility No. 1: 3,100,000 gpd.

WQ0010490-003 – Harlingen Water Works Facility No. 2: 12,200,000 gpd.

WQ0010504-001 – City of Donna: 2,700,000 gpd: unnamed drainage ditch to Llano Grande Lake - part of the Arroyo Colorado Above Tidal.

WQ0010596-001 – City of Pharr.: 5,000,000 gpd: Hidalgo County Drainage No. 1 Ditch to the Main Floodway in the Arroyo Colorado Above Tidal.

WQ0010619-005 – City of Weslaco South Plant: 2,000,000 gpd: unnamed drainage ditch to the South Donna Drain to Arroyo Colorado Above Tidal.

WQ0010633-003 – City of McAllen Facility No. 2: 10,000,000 gpd: unnamed drainage ditch to Arroyo Colorado Above Tidal.

WQ0010697-001 – City of La Feria: 500,000 gpd: drainage ditch to Arroyo Colorado Above Tidal.

WQ0010972-002 – Palm Valley Estates: 280,000 gpd via irrigation on 139.5 acres of golf course land. (Not plotted on map.)

WQ0011080-001 – City of Hidalgo: 280,000 gpd: Hidalgo County Drainage Ditch along HCID No. 2 Canal to Arroyo Colorado Above Tidal.

WQ0011512-001 – City of San Juan: 4,000,000 gpd: unnamed drainage ditch to the Main Floodway - part of the Arroyo Colorado Above Tidal.

WQ0011628-001 – Winter Garden Park Association: 11,000 gpd: Reba Bass Lake, a closed lake in the drainage area of the Arroyo Colorado Above Tidal.

WQ0011659-001 – Harlingen Consolidated ISD Wilson Elementary.: 6,000 gpd.

WQ00112854-001 – Hidalgo County MUD #1: 500,000 gpd.

WQ0013462-001 – Military Highway WSC Progresso: 400,000 gpd: unnamed drainage ditch to an International Boundary and Water Commission canal to the Arroyo Colorado Above Tidal.

2202 – Arroyo Colorado Above Tidal (continued)

WQ0013462-002 – Military Highway WSC La Paloma: 210,000 gpd via flood irrigation of 59 acres of non public access grassland.

WQ0013462-003 – Military Highway WSC Santa Maria: 230,000 gpd via flood irrigation of 59 acres of land.

WQ0013462-004 – Military Highway WSC San Pedro: 160,000 gpd via flood irrigation of 56 acres of non public access grassland.

WQ0013462-005 – Military Highway WSC Los Indios: 135,000 gpd via flood irrigation of 49 acres of non public access grassland.

WQ0013462-006 – Military Highway WSC South Alamo: 515,000 gpd.

WQ0013523-001 – La Joya ISD La Joya Elementary: 15,000 gpd via a subsurface pressure system with a minimum area of 1.36 acres.

WQ0013523-002 – La Joya ISD Chapa Elementary: 15,000 gpd via a subsurface pressure system with a minimum area of 0.96 acres.

WQ0013523-003 – La Joya ISD Kika Dela Garza Elementary: 15,000 gpd via a subsurface pressure system with a minimum area of 40,000 square feet. (Not plotted on map.)

WQ0013523-004 – La Joya ISD 11th and 12th Elementary: 15,000 gpd via a subsurface pressure system with a minimum area of 1.44 acres.

WQ0013633-001 – City of Alamo: 2,000,000 gpd: Hidalgo County Drainage Ditch #2 to the Arroyo Colorado Above Tidal.

WQ0013680-001 – Donna ISD Runn Elementary: 17,000 gpd: 3-inch force main into a drainage ditch to Donna Irrigation District Drainage Ditch to the Arroyo Colorado Above Tidal.

WQ0013680-002 – Donna ISD Munoz Elementary: 2,500 gpd via subsurface drainfields with a minimum area of 47,600 square feet.

WQ0013680-003 – Donna ISD Garza Elementary: 12,500 gpd via subsurface drainfields with a minimum area of 71,400 square feet.

WQ0013887-001 – Mission ISD Mission Elementary: 3,000 gpd via subsurface drainfields.

WQ0014155-001 – US Department of Agriculture Moore Field WWTP: 3,300 gpd via subsurface drainfields.

WQ0014178-001 – US Fish and Wildlife Service Santa Ana National Wildlife Refuge: 1,500 gpd via evaporation of 1.7 acres.

2202A – Donna Reservoir

333 acres: off-channel irrigation reservoir pumped from Rio Grande near the City of Donna in Hidalgo County.

2006 Monitoring

No CRP or SQWM monitoring is conducted on Donna Reservoir.

Impairments

The segment has an impairment for PCBs in fish tissue. The segment and parameter are included in the TMDL approved by EPA for segment 2202.

Concerns

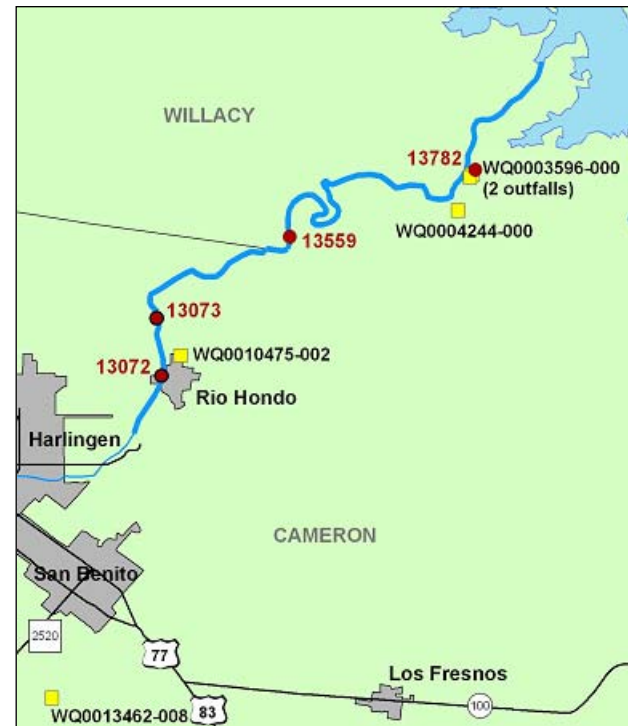
There are no concerns in this segment.

Active Wastewater Permits

There are no active wastewater permits that discharge into this segment.

2201 – Arroyo Colorado Tidal

26 miles: from the confluence with Laguna Madre in Cameron/Willacy County to



a point 100 m (110 yards) downstream of Cemetery Road south of Port Harlingen in Cameron County.

The segment is divided into five assessment units; the lower 9 miles, approximately 2 miles upstream to approximately 2 miles downstream of Marker 22, approximately 3 miles upstream to 2 miles downstream of Marker 27, approximately 1 mile upstream to 3 miles downstream of Camp Perry, and the upper 4 miles of the segment.

2201 – Arroyo Colorado Tidal (continued)

Upper 4 Miles of Segment

2006 Monitoring

13072 – FM 106 Bridge at Rio Hondo

Parameter	Frequency	Agency
24hr DO	2	NRA
Conventional	4	TCEQ Region 15
Bacteria	4	
Field	4	

Approximately 1 mile Upstream to 3 Miles Downstream of Camp Perry

13073 – At Camp Perry North of Rio Hondo

Parameter	Frequency	Agency
24hr DO	2	NRA
Conventional	4	TCEQ Region 15
Bacteria	4	
Field	4	

Approximately 3 Miles Upstream to 2 Miles Downstream of Marker 27

13559 – At Marker 27 (Mile 15) 0.5 Mile North of the Point Where Channel Becomes Boundary Between Willacy And Cameron Counties

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 15
Bacteria	4	
Field	4	

Lower 9 Miles of Segment

13782 – Near CM 16 at Arroyo City, KM 10.9

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 15
Bacteria	4	
Field	4	

2201 – Arroyo Colorado Tidal (continued)

Impairments

Depressed DO is listed as an impairment in the 1 mile upstream to 3 miles downstream of Camp Perry and in the upper 4 miles of the segment. The source of the impairment has been identified as crop-related.

Initial studies indicate that a 90% load reduction would be required for the segment to meet the standard – a goal that is feasibly unrealistic. As a result, the Arroyo Colorado WPP was initiated.

Concerns

Nitrate+nitrite nitrogen is listed as a concern in the approximately 1 mile upstream to 3 miles downstream of Camp Perry, approximately 3 miles upstream to 2 miles downstream of Marker 27, and in the upper 4 miles of the segment.

Ammonia is listed as a concern in the upper 4 miles of the segment.

The source of the nitrogen and ammonia has been identified as crop-related.

These concerns are being addressed by the Arroyo Colorado WPP.

Active Wastewater Permits

WQ0003596-000 – Taiwan Shrimp Village Association and Arroyo Aquaculture Association: 100,000,000 gpd.

WQ0004244-000 – Southern Star Inc.: 50,000,000 gpd.

WQ0010475-002 – City of Rio Hondo: 400,000 gpd.

WQ0010697-002 – City of La Feria: 1,250,000 gpd: drainage ditch to another drainage ditch to the Arroyo Colorado Tidal. (Not plotted on map.)

WQ0011348-002 – River Bend Resort: 1150,000 gpd via surface irrigation of 42.8 acres of golf course. (Not plotted on map.)

WQ0013462-008 – Military Highway WSC Lago: 510,000 gpd: drainage ditch to Resaca Del Rancho Viejo to the Arroyo Colorado Tidal.

Bays, Estuaries, and Gulf of Mexico



Figure 20. Bays, Estuaries, and Gulf of Mexico

There are 16 bay segments and the Gulf of Mexico segment in the basin. Water quality monitoring for FY 2006 includes 54 sites with at least one site on every segment except Conn Brown Harbor. All of the segments will be discussed in detail in the following sections.

Table 7. Assessment Summary for Bays, Estuaries, and Gulf of Mexico

Segment	Description		Concerns	Impairments	TMDL
2462	San Antonio Bay / Hynes Bay / Guadalupe Bay	San Antonio Bay near Austwell	Nitrate+nitrite nitrogen Orthophosphorus Total phosphorus		Bacteria in Oyster Waters
		Guadalupe Bay		Bacteria in oyster waters	
		San Antonio Bay near Seadrift		Bacteria in oyster waters	
		ICWW		Bacteria in oyster waters	
		18.0 square miles in Hynes Bay and upper San Antonio Bay	Bacteria in oyster waters		
2471	Aransas Bay	6.8 square miles along the northern edge of the bay near Rockport	Bacteria in oyster waters		
2472	Copano Bay / Port Bay / Mission Bay	Near FM 188, west of Rockport	Depressed DO		Bacteria in Oyster Waters & Copano Bay Bacteria
		Near FM 136, south of Bayside	Total phosphorus		
		Area along southern shore including Port Bay		Bacteria in oyster waters	
2473	St. Charles Bay	Northeast of Goose Island State Park		Bacteria	
2481	Corpus Christi Bay	16.0 square miles along shoreline near Corpus Christi and Portland		Bacteria in oyster waters	Bacteria in Oyster Waters
2482	Nueces Bay			Zinc in oyster tissue	Zinc in Oyster Tissue
2483	Redfish Bay	Area near SH 361	Depressed DO		
2483A	Conn Brown Harbor			Depressed DO	
2484	Corpus Christi Inner Harbor	Area near Avery Turning Basin	Ammonia		
		Area near Navigation Blvd.	Ammonia Nitrate+nitrite nitrogen		
		Area near Viola Turning Basin	Ammonia Nitrate+nitrite nitrogen		
2485	Oso Bay	Lower portion of bay		Depressed DO Bacteria	Oso Bay and Oso Creek Bacteria & Oso Bay and Laguna Madre DO
		Middle portion of bay near SH 358		Depressed DO Bacteria	
		Middle portion of bay near railroad bridge		Depressed DO	
		Upper portion of bay		Depressed DO	
		Lower portion of bay, western side	Depressed DO Elevated nutrients Excessive algal growth	Bacteria	

Table 7. (cont.)

2491	Laguna Madre	Upper Laguna Madre near Packery Channel		Depressed DO	Oso Bay and Laguna Madre DO
		Area near upper end of Padre Island National Seashore		Depressed DO	
		Area around mouth of Baffin Bay	Excessive algal growth	Depressed DO	
		Area around mouth of Arroyo Colorado	Ammonia Nitrate+nitrite nitrogen Orthophosphorus Total phosphorus	Depressed DO	
		18.1 square miles near the Arroyo Colorado and along ICWW	Bacteria in oyster waters		
2492	Baffin Bay	Upper Baffin Bay near Los Olmos and Fernando Creek arms	Excessive algal growth		
2494	Brownsville Ship Channel	Turning Basin	Depressed DO		
2501	Gulf of Mexico			Mercury in king mackerel > 43 inches	

Table 8. FY 2005 Monitoring Stations for Bays, Estuaries, and Gulf of Mexico

Segment	Station ID	Station Description
2462	13397	San Antonio Bay Intracoastal Canal at Buoy C-17
	14956	Hynes Bay At Austwell at Texas Parks And Wildlife Public Boat Ramp
2463	13400	Mesquite Bay South of Intracoastal Waterway Marker 13
2471	13402	Aransas Bay Intersection of Intracoastal Canal and Lydia Ann Channel South of Rockport
	16232	Aransas Bay At Broadway and the Inlet Canal to Canoe Lake in Rockport
	16492	Aransas Bay In Lydia Ann Channel Directly West of Aransas Light House
2472	12945	Copano Bay At FM 136 Bridge South of Bayside
	13404	Copano Bay West Side of Fishing Pier, Alongside SH 35
	13405	Copano Bay At FM 881 West of Rockport
	14783	Copano Bay 1 Mile East of Bayside
	17724	Copano Bay Approx. 3.5 Miles West of Copano Bay Fishing Pier Boat Ramp at South End of Copano Bay Causeway (SH 35)
2473	13406	St. Charles Bay Northeast of Goose Island State Park
2481	13407	Corpus Christi Bay At Corpus Christi Channel Marker 62
	13409	Corpus Christi Bay La Quinta Channel Marker 16
	13410	Corpus Christi Bay Near Corpus Christi Ship Channel Marker 86
	13411	Corpus Christi Bay ½ Mile off Doddridge Road
	14355	Corpus Christi Bay Near Shamrock Point
	17791	Corpus Christi Bay Approx. 3.1 Miles Southwest of Shamrock Point on Shamrock Island
2482	13420	Nueces Bay US 181 Bridge at Causeway (North Side)
	13421	Nueces Bay US 181 Bridge At Causeway (South Side)
	13422	Nueces Bay ½ Mile From South Shore at East Overhead Power Line
	13423	Nueces Bay 1 Mile From North Shore at East Overhead Power Line
	13424	Nueces Bay ½ Mile From North Shore at West Overhead Powerline at the 11th Pair Of Pylons From the North Shore
	13425	Nueces Bay Near Whites Point
	14833	Nueces Bay, South Side of Bay at Central Power And Lights Discharge
	18365	Nueces Bay Near S Shore Just S Of E-W Powerlines Between Pylons 10-11 1.08 Km W and 362 M N of Northernmost Point of Burlison Rd

Table 8 (cont.)

2483	13426	Redfish Bay SH 361 at 3rd Bridge Between Aransas Pass and Port Aransas
	14801	Redfish Bay At the ICWW at Aransas Pass
2484	13430	Corpus Christi Inner Harbor US 181 Bridge At Causeway (South Side)
	13432	Corpus Christi Inner Harbor Near Navigation Blvd. Draw Bridge
	13436	Corpus Christi Inner Harbor Mid- Channel, Adjacent to the Saber Refining Co Barge Dock
	13439	Corpus Christi Inner Harbor In Viola Turning Basin
2485	13026	At Yorktown Bridge in Corpus Christi
	13440	Oso Bay At Padre Island Drive (SH 358)
	13441	Opposite Oso WWTP Discharge, 500' east of Ennis Joslin Rd.
	13442	Oso Bay 13442 - Ocean Drive
2491	13443	Laguna Madre South of the Intersection of GIWW and Padre Island Causeway
	13444	Laguna Madre At Intersection of GIWW at Baffin Bay Marker
	13445	Laguna Madre At GIWW Near Bird Island
	13446	Laguna Madre GIWW at Marker 129 East of Port Isabel
	13447	Intersection of GIWW and Arroyo Colorado
	13448	Laguna Madre Intersection of GIWW and Port Mansfield Channel
	13449	Laguna Madre Channel Marker C-225A North of Port Mansfield
14870	Laguna Madre 200 yds. Off Laguna Vista Shoreline	
2492	13450	Baffin Bay At Channel Marker 14
	13452	Baffin Bay At Channel Marker 36
2493	13459	South Bay Near Ship Channel Marker 1
	14865	South Bay Middle of Bay
2494	13460	Brownsville Ship Channel Near Ship Channel Marker 35 (Black Buoy)
	14871	Brownsville Ship Channel At East End of Turning Basin
	14875	Brownsville Ship Channel At Entrance to San Martin Lake
2494A	13285	Port Isabel Fishing Harbor At Hwy 100 Bridge
2501	13468	Gulf of Mexico At Port Aransas Near End of South Jetty Near Marker R-7
	13470	Gulf of Mexico At Port Isabel, Just Beyond Jetties at Bell Buoy

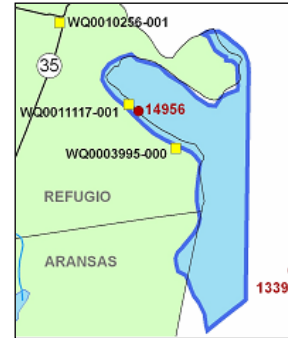
2462 – San Antonio Bay / Hynes Bay / Guadalupe Bay
2463 – Mesquite Bay
2473 – St. Charles Bay



Figure 21. San Antonio Bay / Hynes Bay / Guadalupe Bay / Mesquite Bay : St. Charles Bay

2462 – San Antonio Bay / Hynes Bay / Guadalupe Bay

119.5 square miles.



The segment is divided into three assessment units; 8.0 square miles of San Antonio Bay near Seadrift, Hynes Bay near Austwell, and the remainder of the bay.

2006 Monitoring
Remainder of Bay
13397 – Intracoastal Canal at Buoy C-17

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Hynes Bay Near Austwell

14956 – At Austwell at Texas Parks And Wildlife Public Boat Ramp

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

Impairments

There is an impairment for bacteria for oyster waters for Guadalupe Bay, San Antonio Bay near Seadrift, and intracoastal waterway (ICWW). The assessment is based on shellfish classification maps produced by DSHS.

A TMDL is underway for all affected bays along the Texas Coast to try and identify the source of the bacteria. Participants in the TMDL, led by DSHS, are the Texas General Land Office (TGLO), TPWD, the Galveston Bay Estuary Program, EPA, and the Coastal Bend Bays Estuary Program. More information can be found at <http://www.tceq.state.tx.us/implementation/water/tmdl/35-gulfcoastoysters.html>.

Concerns

Bacteria for oyster waters is listed as a concern for the 18.0 square miles in Hynes Bay and upper San Antonio Bay.

Nitrate+nitrite nitrogen, orthophosphorus, and total phosphorus have been identified as concerns in San Antonio Bay near Austwell. The source of these contaminants has been identified as dry and/or wet weather municipal point source discharges.

2462 – San Antonio Bay / Hynes Bay / Guadalupe Bay
(continued)

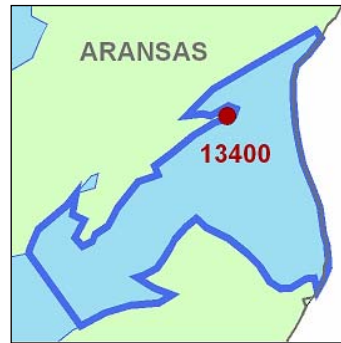
Active Wastewater Permits

WQ0003995-000 – Austwell Auqa Farm, Inc: 3,700,000 gpd of aquaculture pond effluent.

WQ0010256-001 – Refugio WCID No. 1

WQ0011117-001 – City of Austwell

2463 – Mesquite Bay



12.6 square miles.

The segment is divided into two assessment units; the northern portion and the remainder of the bay.

The segment is divided into two oyster waters assessment units, 12.0 square miles in the main portion of the three bays, and 0.6 square miles near ICWW.

2006 Monitoring
Remainder of Bay

13400 – South of Intracoastal Waterway Marker 13

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

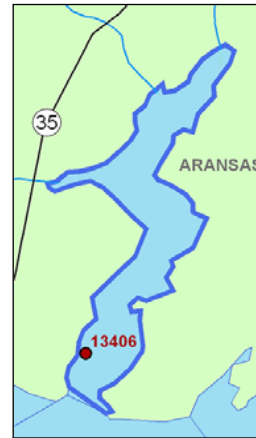
Impairments and Concerns

There are no impairments or concerns in this segment.

Active Wastewater Permits

There are no active wastewater permits in this segment.

2473 – St. Charles Bay



13.1 square miles.

The bay is divided into two assessment units; northeast of Goose Island State Park and the remainder of the bay.

2006 Monitoring

Northeast of Goose Island State Park

13406 – Northeast of Goose Island State Park

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

Impairments

Bacteria has been identified as an impairment in the area northeast of Goose Island State Park. The source(s) of this impairment is unknown. Although it is in close proximity, this segment was not included in the Copano Bay Bacteria TMDL discussed on Page 44 of this report. Routine sampling will be continued in order to collect additional data and information for future assessments.

Concerns

There are no concerns in this segment.

Active Wastewater Permits

There are no active wastewater permits in this segment.

2472 – Copano Bay / Port Bay / Mission Bay
2471 – Aransas Bay

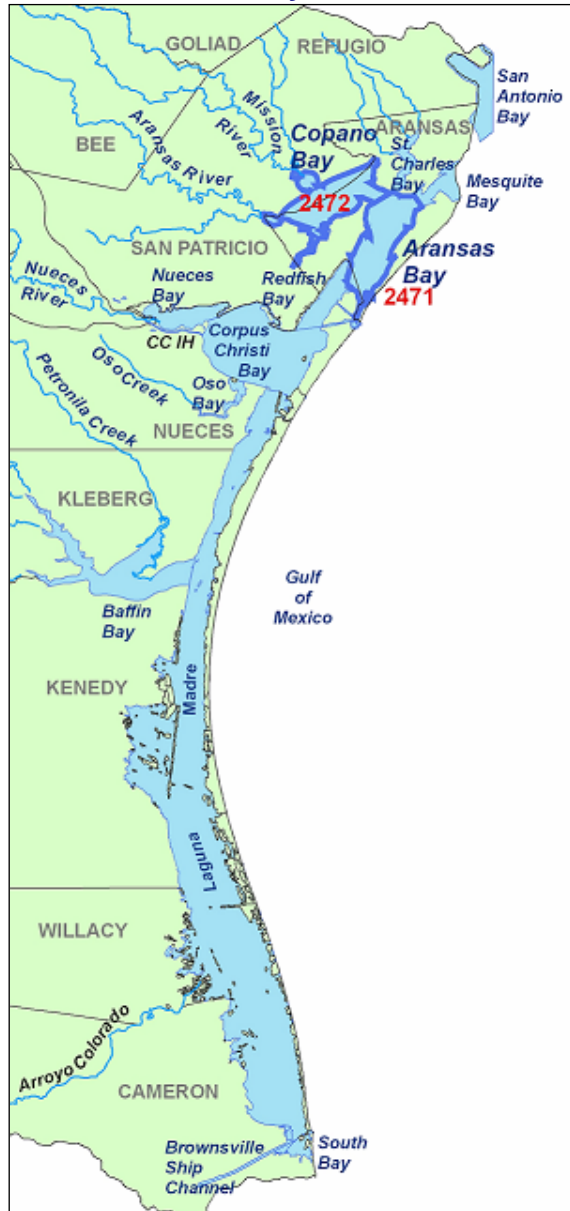
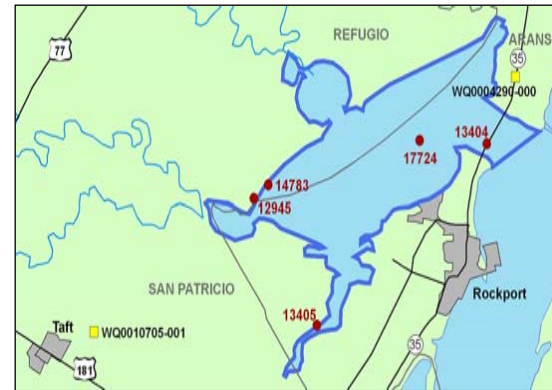


Figure 22. Copano Bay / Port Bay / Mission Bay : Aransas Bay

2472 – Copano Bay / Port Bay / Mission Bay

65.2 square miles.



The bay is divided into five assessment units: the area near SH 35; the area near FM 188, west of Rockport; the area near FM 136, south of Bayside; the area east of Bayside; and the remainder of the bay.

The bay is divided into three oyster waters assessment units; the area along southern shore including

Port Bay, area near Bayside, and the main portion of Copano Bay.

2006 Monitoring

Area Near FM 136

12945 – At FM 136 Bridge South of Bayside

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

Area Near SH 35

13404 – West Side of Fishing Pier, Alongside SH 35

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

Area Near FM 188

13405 – At FM 188 West of Rockport

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

Area East of Bayside

14783 – 1 Mile East of Bayside

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

2472 – Copano Bay / Port Bay / Mission Bay (continued)

Remainder of Bay

17724 – Approx. 3.5 Miles West of Copano Bay Fishing Pier Boat Ramp at South End of Copano Bay Causeway (SH 35)

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Impairments

There is an impairment for bacteria for oyster waters in the area along the southern shore including Port Bay and the area near Bayside. The assessment is based on shellfish classification maps produced by DSHS.

A TMDL is currently underway to address bacteria in oyster-harvesting waters in Copano Bay. The tidal segments of the Aransas and Mission Rivers are included in the study. Initial studies indicate that cows have the greatest impact on bacteria concentrations in Copano Bay. The study also determined the load reductions necessary to meet water quality standards. Recommendations include:

- More monitoring data should be collected along the Aransas and Mission River Tidal segments
- More monitoring data should be collected at WWTPs in the watershed
- Fecal coliform loadings should be converted into enterococci loadings
- More monitoring of enterococci should be implemented on the tidal segments

More information is available at

<http://www.tceq.state.tx.us/implementation/water/tmdl/42-copano.html>.

This bay is included in the Oyster Waters TMDL discussed in the write up for Segment 2462.

Concerns

Total phosphorus has been identified as a concern in the area near FM 136, south of Bayside.

Depressed DO has been identified as a concern in the area near FM 188, west of Rockport. Ten 24-hour DO measurements were collected between July 2002 and August 2004 and all averages values were above the standard of 5 MG/L. The 2006 Assessment should remove this concern.

Active Wastewater Permits

WQ0003487-000 – Town of Bayside (Not plotted on map.)

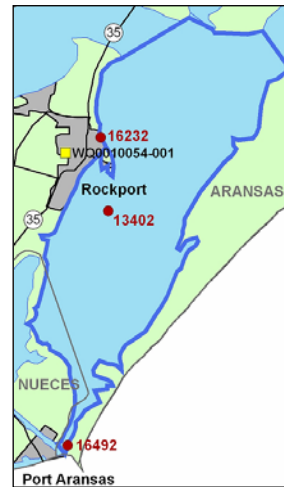
WQ0004290-000 – Holiday Beach WSC: 120,000 gpd: Taft Drainage Ditch to Mud Flats to Copano Bay.

2472 – Copano Bay / Port Bay / Mission Bay (continued)

WQ0010705-001 – City of Taft: 900,000 gpd: four inch pipe to a tidal ditch to Copano Bay.

WQ0011228-001 – Aransas County Airport: 3,600 gpd via evaporation. (Not plotted on map.)

2471 – Aransas Bay



87.8 square miles.

The segment is divided into three assessment units; middle of bay near Shell Ridge, lower portion of bay in Lydia Ann Channel, and remainder of the bay.

The segment is divided into oyster water assessment units; 81.0 square miles in the main portion of the bay, and 6.8 square miles along the northern edge of the bay and near Rockport.

2006 Monitoring

Middle of Bay Near Shell Ridge

13402 – Intersection of Intracoastal Canal and Lydia Ann Channel South of Rockport

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Remainder of Bay

16232 – At Broadway and the Inlet Canal to Canoe Lake in Rockport

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Lower Portion of Bay in Lydia Ann Channel

16492 – In Lydia Ann Channel Directly West of Aransas Light House

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

2471 – Aransas Bay (continued)

Impairments

There are no impairments in this segment.

Concerns

Bacteria for oyster waters is listed as a concern for the 6.8 square miles along the northern edge of the bay and near Rockport.

Active Wastewater Permits

WQ0010054-001 – City of Rockport: 2,500,000 gpd: Tulle Ditch to Tulle Lake to an unnamed ditch to Little Bay to Aransas Bay. Also authorizes the disposal of treated domestic wastewater via irrigation of 200 acres.

2483 – Redfish Bay

2483A – Conn Brown Harbor

2501 – Gulf of Mexico (Port Aransas Area)

2481 – Corpus Christi Bay

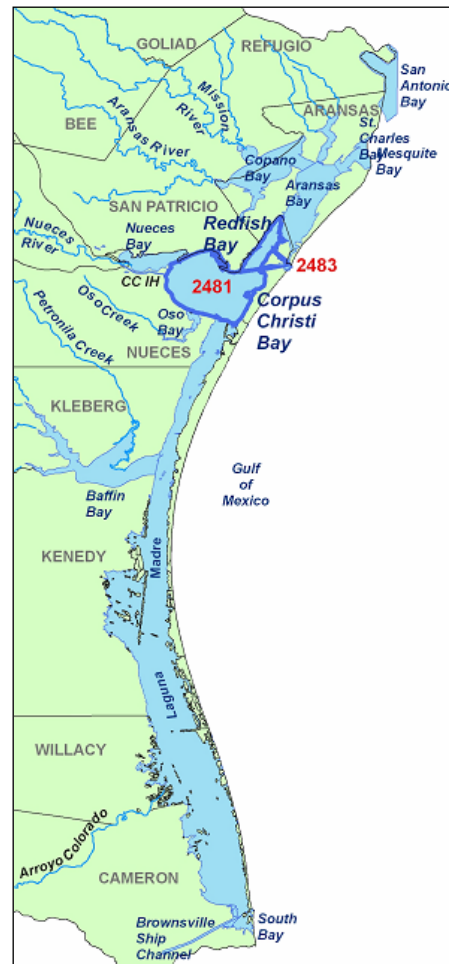
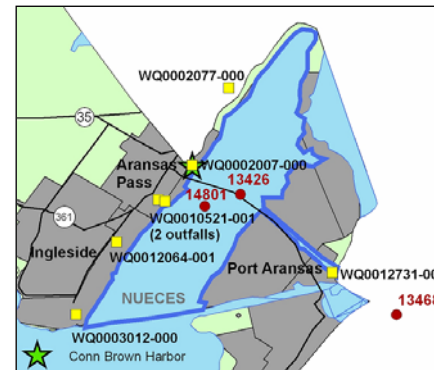


Figure 23. Redfish Bay : Conn Brown Harbor : Gulf of Mexico : Corpus Christi Bay

2483 – Redfish Bay



28.8 square miles:

The bay is divided into four assessment units; the area near SH 361, the area near Ransom Island, ICWW near Ingleside, and the rest of the bay.

2006 Monitoring Area Near SH 361

13426 – SH 361 at 3rd Bridge Between Aransas Pass and Port Aransas

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	

14801 – At the ICWW at Aransas Pass

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Impairments

There are no impairments in this segment.

Concerns

There is a concern for depressed DO in the area near SH 361. Ten 24-hour DO measurements were collected between July 2002 and September 2004 and all were above the standard of 5 MG/L. The 2006 Assessment should remove this concern.

Active Wastewater Permits

WQ0002077-000 – Degussa Engineered Carbons

WQ0003012-000 – Aker Gulf Marine

WQ0010521-001 – City of Aransas Pass

2483 – Redfish Bay (continued)

WQ0012064-001 – Aker Gulf Marine: 12,000 gpd: via pipe to a drainage ditch to Redfish Bay.

WQ0012731-001 – Tesoro Marine Service: 3,800 gpd.

2483A – Conn Brown Harbor

0.07 square miles: from the confluence with the Aransas Channel southeast of Aransas Pass in San Patricio County to a point 1 mile northeast in Aransas County.

2006 Monitoring

No FY 2006 CRP or SWQM monitoring is being conducted in this segment since the conclusion of the TMDL (see discussion below). That site was located near the mouth of the harbor. At the FY 2007 coordinated monitoring meeting it was decided that NRA would add a monitoring site closer to the center of the harbor.

Impairments

The harbor has an impairment for depressed DO. The 24-hour DO monitoring conducted by The University of Texas Marine Science Institute at Port Aransas for this impairment has been completed. The results indicate that the harbor is meeting the DO standard and the report recommends delisting of this segment from the 303D list.

Concerns

There are no concerns in this segment.

Active Wastewater Permits

WQ0002007-000 – Liberty Seafood

2501 – Gulf of Mexico

The lower gulf is divided into three assessment units; the Port Aransas area, the Port Isabel area, and the Port Mansfield area.

2006 Monitoring

13468 – At Port Aransas Near End of South Jetty Near Marker R-7

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Impairments

Based on data from DSHS, all areas are listed as having an impairment for mercury in King Mackerel > 43 inches long. The source of the mercury is attributed to atmospheric deposition.

2501 – Gulf of Mexico (continued)

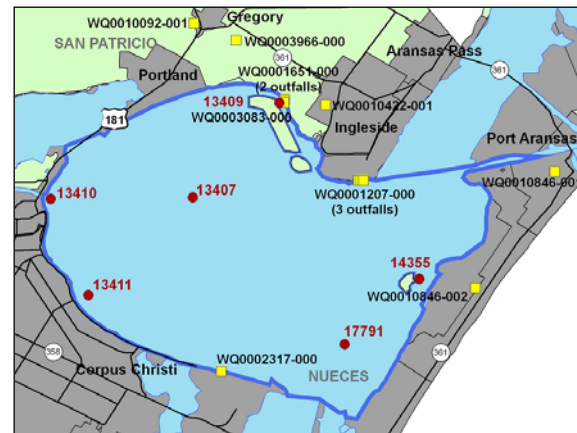
Concerns

There are no concerns in this segment.

Active Wastewater Permits

There are no active wastewater permits in this segment.

2481 – Corpus Christi Bay



123.1 square miles.

The bay is divided into six assessment units; mid-bay north near channel marker 62, near Shamrock Cove, La Quinta Channel near channel marker 16, Corpus Christi Channel near channel marker 86, off Doddridge Rd., and the remainder of the bay.

The bay is divided into two oyster waters

assessment units; 16.0 square miles along shoreline near Corpus Christi and Portland and 107.1 square miles in the main portion of the bay.

2006 Monitoring

Mid Bay North Near Channel Marker 62

13407 – At Corpus Christi Channel Marker 62

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

La Quinta Channel Near Channel Marker 16

13409 – La Quinta Channel Marker 16

Parameter	Frequency	Agency
Metals in Water	2	TCEQ Region 14
Metals in Sediment	2	
Organics in Sediment	2	
Conventional	4	
Bacteria	4	
Field	4	

2481 – Corpus Christi Bay (continued)

Corpus Christi Channel Near Channel Marker 86

13410 – Near Corpus Christi Ship Channel Marker 86

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Off Doddridge Road

13411 – ½ Mile off Doddridge Road

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Near Shamrock Cove

14355 – Near Shamrock Point

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Remainder of Bay

17791 – Approx. 3.1 Miles Southwest of Shamrock Point on Shamrock Island

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Impairments

There is an impairment for bacteria for oyster waters in the 16.0 square miles along shoreline near Corpus Christi and Portland. The assessment is based on shellfish classification maps produced by DSHS.

This bay is included in the TMDL discussed in the write up for Segment 2462.

More information can be found at

<http://www.tnrcc.state.tx.us/water/quality/tmdl/gulfcoastoyster.pdf>.

Concerns

There are no concerns in this segment.

2481 – Corpus Christi Bay (continued)

Active Wastewater Permits

WQ0001207-000 – Koch Pipeline Company, LP: storm water runoff associated with industrial activity via Outfalls 001, 002, 003, and 004: roadside ditch to Corpus Christi Bay.

WQ0001651-000 – E. I. Du Pont De Nemours & Co.: 4,610,000 gpd via Outfall 001: pipe with a submerged outlet into a barge slip on La Quinta Channel to Corpus Christi Bay; and storm water runoff on an intermittent and flow variable basis via Outfall 002.

WQ0002317-000 – US Department of the Navy Corpus Christi NAS: 1,510,000 gpd.

WQ0003083-000 – Occidental Chemical Corporation: 2,240,000 gpd: submerged pipeline in La Quinta Channel.

WQ0003966-000 – Reynolds Metal Company: 1,000 metric tons per year on 190 acres of closed bauxite tailing beds.

WQ0004165-000 – Texas A&M University System: 30,000 gpd via Outfalls 001 and 002. (Not plotted on map).

WQ0010092-001 – City of Gregory: 320,000 gpd: drainage ditch to Green Lake to Corpus Christi Bay.

WQ0010422-001 – City of Ingleside

WQ0010846-001 – Nueces Co. WCID No. 4 Mustang Island North Plant: 1,880,000 gpd: mud flat to Corpus Christi Bay.

WQ0010846-002 – Nueces Co. WCID No. 4 Mustang Island South Plant: 1,200,000 gpd: through 350 feet of diffuser pipe to a mud flats to Shamrock Cove to Corpus Christi Bay.

2482 – Nueces Bay

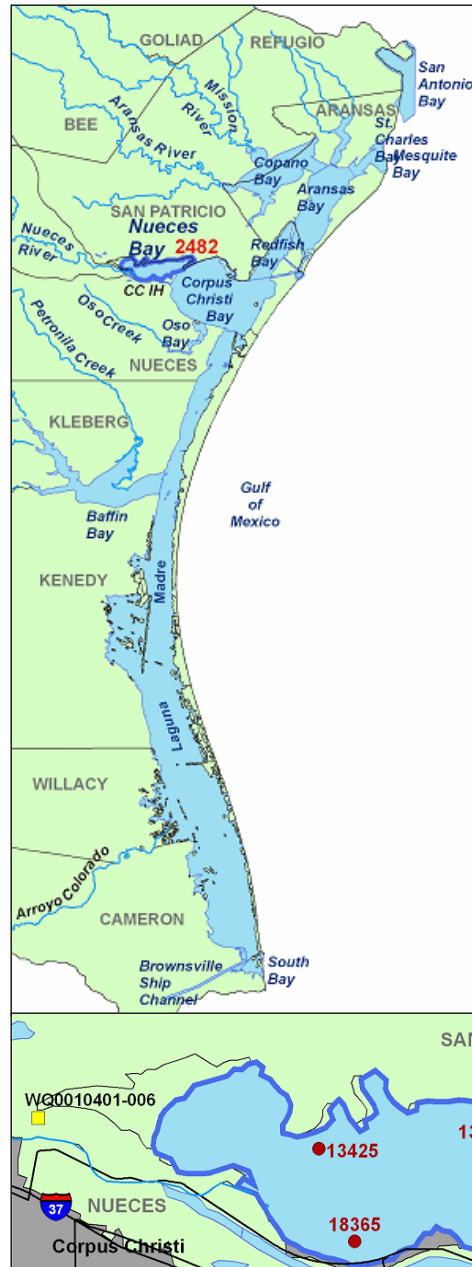


Figure 24. Nueces Bay:

28.9 square miles.

The bay is divided into four assessment units, US 181 Causeway, south shore power line, near Whites Point, and the remainder of the bay.

2482 – Nueces Bay (continued)

2006 Monitoring

Remainder of Bay

13420 – US 181 Bridge at Causeway (North Side)

Parameter	Frequency	Agency
Metals in Water	4 (Zinc)	TCEQ TMDL (CCS)
Field	4	

14833 – South Side of Bay at Central Power And Light's Discharge

Parameter	Frequency	Agency
Metals in Water	4 (Zinc)	TCEQ TMDL (CCS)
Field	4	

18365 – Near S Shore Just S of E-W Powerlines Between Pylons 10-11 1.08 Km W and 362 M N of Northernmost Point of Burleson Rd

Parameter	Frequency	Agency
Metals in Water	4 (Zinc)	TCEQ TMDL (CCS)
Field	4	

13423 – 1 Mile From North Shore at East Overhead Power Line

Parameter	Frequency	Agency
Metals in Water	4 (Zinc)	TCEQ TMDL (CCS)
Field	4	

13424 – ½ Mile From North Shore at West Overhead Powerline at the 11th Pair Of Pylons From the North Shore

Parameter	Frequency	Agency
Metals in Water	4 (Zinc)	TCEQ TMDL (CCS)
Field	4	

US 181 Causeway

13421 – US 181 Bridge At Causeway (South Side)

Parameter	Frequency	Agency
Metals in Water	4 (Zinc)	TCEQ TMDL (CCS)
Field	4	
Conventional Bacteria	4	TCEQ Region 14
Field	4	

2482 – Nueces Bay (continued)

South Shore Power Line

13422 – ½ Mile From South Shore at East Overhead Power Line

Parameter	Frequency	Agency
Metals in Water	4 (Zinc)	TCEQ TMDL (CCS)
Field	4	
Metals in Water	2	TCEQ Region 14
Conventional	4	
Bacteria	4	
Field	4	

Whites Point

13425 – Near Whites Point

Parameter	Frequency	Agency
Metals in Water	4 (Zinc)	TCEQ TMDL (CCS)
Field	4	
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Impairments

The entire bay has an impairment for zinc in oyster tissue. A TMDL is underway. The majority of zinc loadings (66%) were attributed to once-through cooling water that originates in the Corpus Christi Harbor from discharges by the CPL Nueces Bay Plant. Approximately 23% of the loadings were attributed to atmospheric deposition, 5% to Lake Corpus Christi, 5% to land surface runoff, and 1% to the remaining permitted dischargers.

Metals sampling is also being conducted in Segment 2101, Nueces River Tidal, and Segment 2484, Corpus Christi Ship Channel in conjunction with this TMDL.

More information on the TMDL, which is funded through FY 2006, is available at <http://www.tceq.org/implementation/water/tmdl/21-nuecesbay.html>.

Concerns

There are no concerns in this segment.

Active Wastewater Permits

WQ0001244-000 – Nueces Bay WLE LP: 500,000,000 gpd (once through cooling water and previously monitored effluent.)

WQ0010401-006 – City of Corpus Christi (Allison Plant): 5,000,000 gpd via Outfalls 001 (Nueces River Tidal) and 002.

WQ0010478-001 – City of Portland WWTP: 2,500,000 gpd: drainage ditch to Nueces Bay.

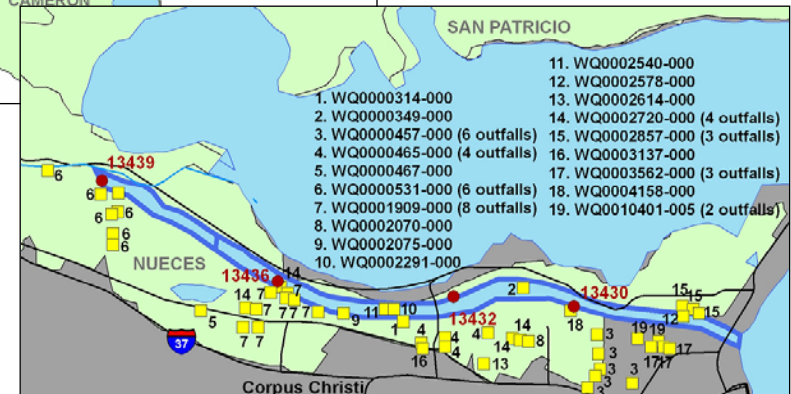
WQ0011096-001 – Sublight Enterprises, Inc. (Portland Inn)

2484 – Corpus Christi Inner Harbor



Figure 25. Corpus Christi Inner Harbor: 0.7 square miles.

The harbor is divided into three sub-segments; the area near Avery Turning Basin, the area near Navigation Blvd., and the area near Viola Turning Basin.



2484 – Corpus Christi Inner Harbor (continued)

2006 Monitoring

13436 – Mid-Channel, Adjacent to the Saber Refining Co. Barge Dock

Parameter	Frequency	Agency
Metals in Water	4 (Zinc)	TCEQ TMDL (CCS)
Field	4	

Area Near Viola Turning Basin

13439 – In Viola Turning Basin

Parameter	Frequency	Agency
Metals in Water	4 (Zinc)	TCEQ TMDL (CCS)
Field	4	
Metals in Water	2 (Zinc)	TCEQ Region 14
Organics in Water	2 (Zinc)	
Conventional	4	
Bacteria	4	
Field	4	

Area Near Navigation Blvd.

13432 – Near Navigation Blvd. Draw Bridge

Parameter	Frequency	Agency
Metals in Water	4 (Zinc)	TCEQ TMDL (CCS)
Field	4	
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Area Near Avery Turning Basin

13430 – US 181 Bridge At Causeway (South Side)

Parameter	Frequency	Agency
Metals in Water	4 (Zinc)	TCEQ TMDL (CCS)
Field	4	
Metals in Water	2 (Zinc)	TCEQ Region 14
Metals in Sediment	2	
Organics in Sediment	2	
Conventional	4	
Bacteria	4	
Field	4	

Impairments

There are no impairments in this segment.

Concerns

Ammonia has been identified as a concern in the entire harbor.

Nitrate+nitrite nitrogen has been identified as a concern in the area near Navigation Blvd. and in the area near the Viola Turning Basin.

2484 – Corpus Christi Inner Harbor (continued)

Active Wastewater Permits

WQ0000314-000 – Encycle / Texas, Inc.: 750,000 gpd

WQ0000349-000 – Elementis Chromium LP: 20,000 gpd.

WQ0000457-000 – Flint Hills Resources LP: 2,160,000 gpd.

WQ0000465-000 – Coastal Refining and Marketing

WQ0000467-000 – Citgo Refining and Chemicals.: 3,500,000 gpd via Outfall 001; 1,600,000 gpd via Outfall 2; intermittent stormwater runoff via Outfalls 003, 004, 005, 006, and 007.

WQ0000531-000 – Flint Hills Resources LP: 145,000 gpd via irrigation on Unit 1 & 2; stormwater discharge from construction activities, add waste streams via Outfalls 004, 011, and 012: Outfall 001 - ditch to tidal bayou to Tule Lake Turning Basin; Outfalls 002, 004, 007, 009 and 012 - ditch to Tule Lake Channel; Outfall 003 - ditch to the Viola Turning Basin; Outfall 006 - docks in Viola Turning Basin; Outfall 011 - Corpus Christi Inner Harbor.

WQ0001909-000 – Valero Refining: Company-Texas: 2,390,000 gpd via Outfall 003; 50,000 gpd via Outfall 005; 3,300,000 gpd via Outfall 007.

WQ0002070-000 – Williams Terminals Holdings: 350,000 gpd: plant to drainage Ditch to Inner Harbor.

WQ0002075-000 – Equistar Chemicals LP: 2,000,000 gpd.

WQ0002291-000 – Applied Industrial Materials

WQ0002540-000 – Coastal Refining and Marketing: stormwater on intermittent and flow variable basis.

WQ0002578-000 – Koch Pipeline Company LP

WQ0002614-000 – Citgo Refining and Chemicals: stormwater on intermittent and flow variable rate via Outfalls 001, 002, and 003: unnamed ditch to Inner Harbor.

WQ0002720-000 – Trifinery Petroleum Services: 120,000 gpd via Outfall 001: Valero Storm Water Culvert to underground pipe to Inner Harbor; stormwater on intermittent and flow variable basis via Outfall 002: unnamed ditch to Tule Lake to Inner Harbor.

WQ0002857-000 – Shamrock Logistics Operations Diamond Shamrock Refining

WQ0003137-000 – Javelina Company

2484 – Corpus Christi Inner Harbor (continued)

WQ0003562-000 – Citgo Refining and Chemicals: stormwater on intermittent and flow variable rate via Outfalls 001, 002, and 003: unnamed ditch to Inner Harbor.

WQ0004158-000 – Corpus Christi Cogeneration: 11,000,000 gpd.

WQ0010401-005 – City of Corpus Christi Broadway Plant: 10,000,000 gpd.

2485 – Oso Bay

2485 – Laguna Madre

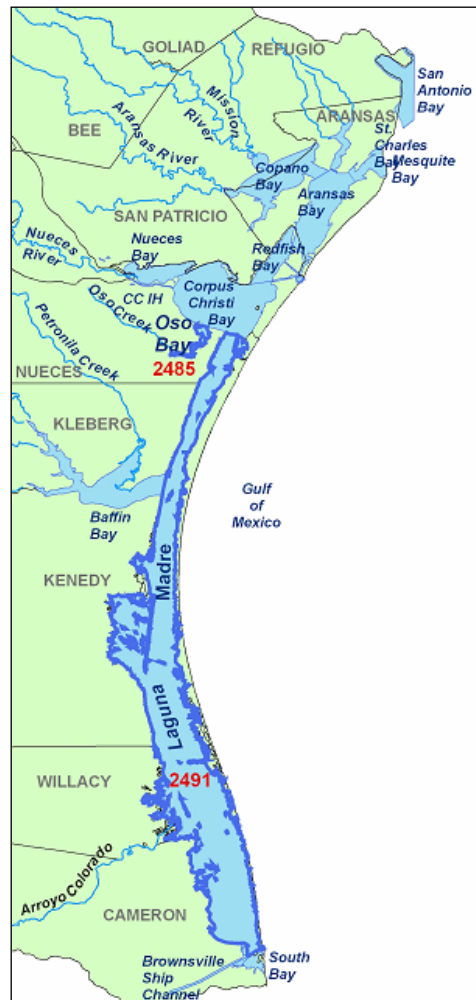
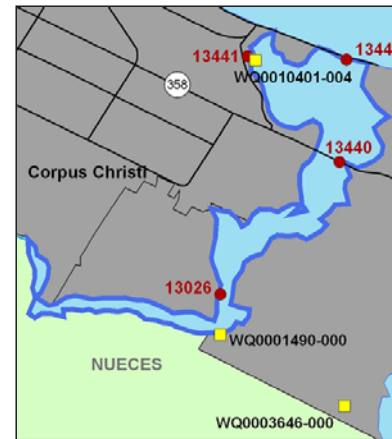


Figure 26. Oso Bay : Laguna Madre

2485 – Oso Bay

7.2 square miles.



The bay is divided into five assessment units; lower portion of bay, middle portion of bay near SH 358, middle portion of bay near railroad bridge, upper portion of bay, and lower portion of bay - western side.

2006 Monitoring Lower Portion of Bay

13026 – At Yorktown Bridge in Corpus Christi

Parameter	Frequency	Agency
Bacteria	12	TCEQ TMDL (A&M – CC)
Flow	12	
Field	12	
Bacteria	2	Rainfall Event TCEQ TMDL (A&M – CC)
Flow	2	

Middle Portion of Bay Near SH 358 13440 – At Padre Island Drive (SH 358)

Parameter	Frequency	Agency
Conventional	4	NRA
Bacteria	4	
Field	4	
Bacteria	12	TCEQ TMDL (A&M – CC)
Flow	12	
Field	12	
Bacteria	2	Rainfall Event TCEQ TMDL (A&M – CC)
Flow	2	

2485 – Oso Bay (continued)

Upper Portion of Bay

13441 – Opposite Oso WWTP Discharge, 500' east of Ennis Joslin Rd.

Parameter	Frequency	Agency
Bacteria	12	TCEQ TMDL (A&M – CC)
Flow	12	
Field	12	
Bacteria	2	Rainfall Event TCEQ TMDL (A&M – CC)
Flow	2	

Upper Portion of Bay

13442 – At Ocean Drive

Parameter	Frequency	Agency
Bacteria	12	TCEQ TMDL (A&M – CC)
Flow	12	
Field	12	
Bacteria	2	Rainfall Event TCEQ TMDL (A&M – CC)
Flow	2	

Impairments

The entire bay, except for the lower portion - western side, has an impairment for depressed DO. A TMDL to address low DO is underway in Oso Bay and the Laguna Madre, Segment 2491 – down to the Arroyo Colorado. 24-hour DO monitoring was conducted for this TMDL. The sampling has been completed and a draft report has been prepared that is currently being reviewed by TCEQ. For the most part, the average 24-hour DO criteria is met but the minimum 24-hour values are not met consistently enough to warrant removal from the 303d list in either segments. There are some on-going discussions with the Water Quality Standards group about re-evaluating the standards to determine if the current standard is achievable given the unique conditions of the Laguna Madre (high salinities, warm temperatures and shallow nature of the water body) and its influence on Oso Bay.

The lower portion of the bay, the lower portion of the bay – western side, and the middle portion of the bay near SH 358 have an impairment for bacteria. A TMDL is also underway for this impairment. A hydrologic model is being developed to try and identify the source of the bacteria. The bacteria is generally believed to be from municipal discharges and non-point source runoff. More information on the TMDL is available at <http://www.tceq.org/implementation/water/tmdl/24-osobayoxygen.html>. This TMDL also includes Oso Creek, Segment 2485A.

Concerns

The lower portion of the bay – western side has concerns for depressed DO, elevated nutrients, and excessive algal growth. The source has been identified as municipal discharges.

2485 – Oso Bay (continued)

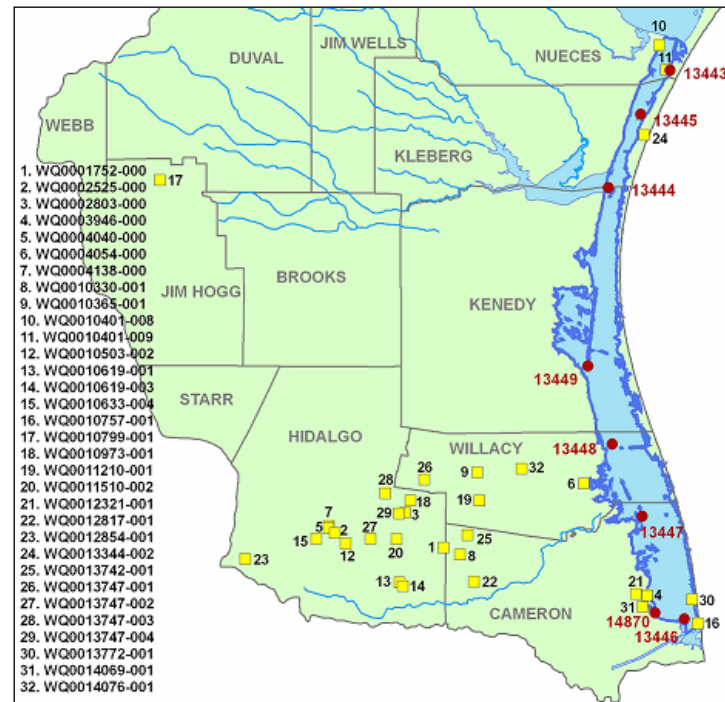
Active Wastewater Permits

WQ0001490-000 – AEP Texas Central Barney M. Davis Plant

WQ0003646-000 – Texas A&M University System La Coss Facility Corpus Christi

WQ0010401-004 – City of Corpus Christi Oso Facility

2491 – Laguna Madre



347.4 square miles

The Laguna is divided into eleven assessment units; upper Laguna Madre near Packery Channel Park, the area near the upper end of Padre Island National Seashore, the area around the mouth of

Baffin Bay, the area around Rincon de San Jose, the area around Port Mansfield, the area around the mouth of the Arroyo Colorado, the area adjacent to the Laguna Atascosa National Wildlife Refuge, the area around Morano Blanco, the Lower Laguna Madre near Laguna Heights and Laguna Vista, the lower Laguna Madre from Andie Bowie Park to Isla Blanca Park to Port Isabel, and the remainder of the segment.

The Laguna is divided into three oyster waters assessment units; 18.1 square miles near the Arroyo Colorado and along the ICWW, the main portion of the Laguna Madre south of Ports Mansfield, and the remainder of the Laguna Madre north of Port Mansfield.

2491 – Laguna Madre (continued)**2006 Monitoring****Upper Laguna Madre Near Packery Channel Park****13443 – South of the Intersection of GIWW and Padre Island Causeway**

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Upper End of Padre Island National Seashore**13445 – At GIWW Near Bird Island**

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Mouth of Baffin Bay**13444 – At Intersection of GIWW at Baffin Bay Marker**

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Rincon de San Jose**13449 – Channel Marker C-225A North of Port Mansfield**

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 15
Bacteria	4	
Field	4	

Port Mansfield**13448 – Intersection of GIWW and Port Mansfield Channel**

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 15
Bacteria	4	
Field	4	

Mouth of the Arroyo Colorado**13447 – Intersection of GIWW and Arroyo Colorado**

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 15
Bacteria	4	
Field	4	

2491 – Laguna Madre (continued)**Lower Laguna Madre Near Laguna Heights and Laguna Vista****14870 – 200 yds. Off Laguna Vista Shoreline**

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 15
Bacteria	4	
Field	4	

Laguna Madre from Andie Bowie Park to Isla Blanca Park to Port Isabel**13446 – GIWW at Marker 129 East of Port Isabel**

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 15
Bacteria	4	
Field	4	

Impairments

The area around the mouth of Baffin Bay, the area around the mouth of the Arroyo Colorado, the area near the upper end of Padre Island National Seashore, and the Upper Laguna Madre near Packery Channel have an impairment for depressed DO. See the write up on the TMDL underway in the previous section on Oso Bay, Segment 2485, Page 52.

Concerns

There is a concern for bacteria in oyster waters in the 18.1 square miles near the Arroyo Colorado and along the ICWW.

The area around the mouth of Baffin Bay has a concern for excessive algal growth.

The area around the mouth of the Arroyo Colorado has concerns for ammonia, nitrate+nitrate nitrogen, orthophosphorus, and total phosphorus. The source is believed to be from municipal discharges and urban runoff.

Active Wastewater Permits

WQ0001752-000 – Rio Grande Valley Sugar Growers: 289,000 gpd: Valley Acres Drainage Canal to North Floodway Pilot Channel to Laguna Madre.

WQ0002525-000 – Azteca Milling: 300,000 gpd via irrigation.

WQ0002803-000 – Value Frozen Foods: 537,000 gpd via evaporation and irrigation.

WQ0003946-000 – Harlingen Shrimp Farms, LTD: 8,000,000 gpd: tidal ditch to Laguna Madre.

2491 – Laguna Madre (continued)

WQ0004040-000 – Calpine Construction Finance: Hidalgo County Drainage District Ditch No. 1 (North Main Drain) to Santa Cruz Canal to the Donna Drain to North Floodway Pilot Channel to Laguna Madre.

WQ0004054-000 – Loma Alta Trust (Loma Alta Aquaculture): 8,200,000 gpd: Hidalgo County Drainage Ditch to Laguna Madre.

WQ0004138-000 – Calpine Hidalgo Energy Center: 920,000 gpd: Hidalgo County drainage District Ditch to Santa Cruz Canal to Donna Drain to North Floodway Pilot Channel to Laguna Madre.

WQ0004758-000 – North Alamo WSC (La Sara): 2,000,000 gpd: elevated drainage ditch to North Floodway to Laguna Madre. (Not plotted on map.)

WQ0010330-001 – City of Santa Rosa: 390,000 gpd: unnamed drainage ditch to North Floodway to Laguna Madre.

WQ0010365-001 – City of Raymondville: 1,500,000 gpd: ditch to Delta Irrigation Ditch to Laguna Madre.

WQ0010401-008 – City of Corpus Christi Laguna Madre: 3,000,000 gp: pipeline to Laguna Madre.

WQ0010401-009 – City of Corpus Christi Whitecap

WQ0010503-002 – City of Edinburg: 5,900,000 gpd: San Juan holding pond to drainage ditch to North Floodway to the Laguna Madre.

WQ0010619-001 – City of Weslaco: 250,000 gpd: ditch to North Floodway System to Laguna Madre

WQ0010619-003 – City of Weslaco: 3,000,000 gpd: drainage ditch to North Floodway to Laguna Madre.

WQ0010633-004 – City of McAllen

WQ0010682-003 – Port Mansfield PUD: 221,000 gpd: ditch within Four Mile Slough to Laguna Madre. (Not plotted on map.)

WQ0010757-001 – Laguna Madre Water District Isla Blanca Plant: 2,600,000 gpd via irrigation.

WQ0010799-001 – Jim Hogg County WCID No. 2 (Hebbronville Plant): 796,000 gpd: Noriacitas Creek to Palo Blanco Creek to undefined drainage paths to the Laguna Madre.

2491 – Laguna Madre (continued)

WQ0010973-001 – County of Hidalgo Delta Lake Park: 5,000 gpd: Hidalgo and Willacy WCID Ditch No. 1 to Laguna Madre.

WQ0011210-001 – City of Lyford: 270,000 gpd: drainage ditch to North Floodway to Laguna Madre.

WQ0011510-002 – City of Elsa: 800,000 gpd: ditch to HCCID Ditch 10F to North Floodway to Laguna Madre.

WQ0012321-001 – U.S. Department of Homeland Security Immigration and Customs Enforcement: 160,000 gpd: ditch to Cameron County WCID No. 11 Drainage Ditch to Laguna Madre.

WQ0012817-001 – Fig Tree R.V. Resort, L.C.

WQ0012854-001 – Hidalgo County MUD: 500,000 gpd.

WQ0013344-002 – US Department of the Interior: 25,000 gpd: intermittent wetland to Laguna Madre.

WQ0013742-001 – Sebastian MUD: 250,000 gpd: North Floodway to Laguna Madre.

WQ0013747-001 – North Alamo WSC: 100,000 gpd: series of ditches and drains to Laguna Madre.

WQ0013747-002 – North Alamo WSC: 510,000 gpd via surface irrigation.

WQ0013747-003 – North Alamo WSC: 122,000 gpd via surface irrigation.

WQ0013747-004 – North Alamo WSC: 300,000 gpd: Delta Irrigation District Drain Ditch to series of drainage ditches to the Laguna Madre,

WQ0013772-001 – Laguna Madre Water District Andy Bowie Park Plant: 1,500,000 gpd: wetland area contiguous with and part of Laguna Madre.

WQ0014069-001 – Laguna Madre Water District Laguna WWTP: 650,000 gpd: City of Port Isabel Reservoir to the Laguna Madre.

WQ0014076-001 – City of San Perlita: 100,000 gpd via evaporation/percolation.

- 2492 – Baffin Bay
- 2493 – South Bay
- 2494 – Brownsville Ship Channel
- 2494A – Port Isabel Fishing Harbor
- 2501 Gulf of Mexico (Port Isabel Area)



Figure 27. Baffin Bay :
South Bay : Brownsville
Ship Channel : Port
Isabel Fishing Harbor :
Gulf of Mexico

2492 – Baffin Bay

49.8 square miles.

The bay is divided into three assessment units; Upper Baffin Bay near Los Olmos and Fernando Creek arms, Lower Baffin Bay near Salvation Point and Black Bluff, and the remainder of the segment.



2006 Monitoring

Near Los Olmos and Fernando Creek arms

13452 – At Channel Marker 36

Parameter	Frequency	Agency
Metals in Water	2	TCEQ Region 14
Conventional	4	
Bacteria	4	
Field	4	

Near Salvation Point and Black Bluff

13450 – At Channel Marker 14

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 14
Bacteria	4	
Field	4	

Impairments

There are no impairments in this segment.

Concerns

There is a concern for excessive algal growth in Upper Baffin Bay near Los Olmos and Fernando Creek arms.

2492 – Baffin Bay (continued)

Active Wastewater Permits

WQ0004761-000 – El Paso Merchant Energy-Petroleum Company: 7,200 gpd via evaporation. (Not plotted on map).

WQ0010067-002 – Duval County Conservation and Reclamation District: 40,000 gpd: Macho Creek to Los Olmos Creek to Baffin Bay.

WQ0010084-001 – Utility Board of Falfurias: 460,000 gpd via surface irrigation.

WQ0010253-001 – City of Premont: 430,000 gpd via surface irrigation.

WQ0011515-001 – Riviera ISD: 16,000 gpd via surface irrigation.

WQ0013361-001 – Sarita Sewer Service and WSC: 44,000 gpd via evaporation.

WQ0013374-001 – Kleberg County Kaufer Hubert Memorial Park: 33,000 gpd: Kaufer Lake to Hubert Lake to unnamed ditch to Cayo Del Grullo.

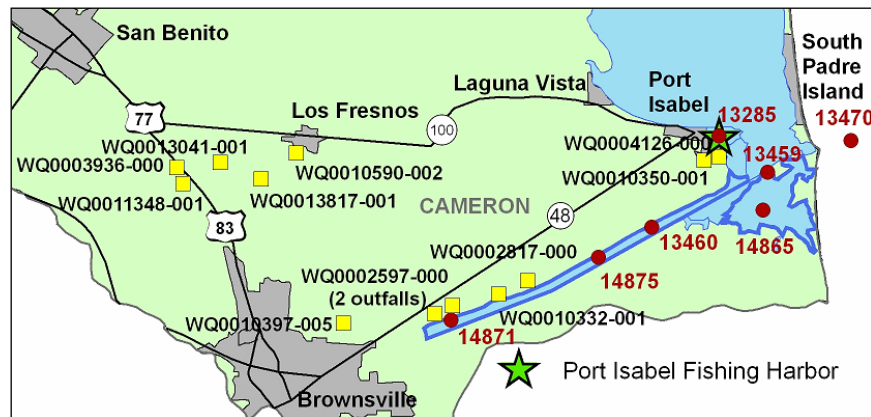
WQ0013374-002 – Riviera WCID: 60,000 gpd: drainage ditch to Salado Creek to Los Olmos Creek, to Baffin Bay.

WQ0013374-003 – County of Kleberg Ricardo WWTP: 48,500 gpd: drainage ditch to Jaboncillos Creek to Baffin Bay.

2493 – South Bay

7.8 square miles.

The segment is divided into three assessment units; near the mouth, in the turning basin, and the mid-portion of the ship channel.



2493 – South Bay (continued)

2006 Monitoring

Entire Segment

13459 – Near Near Ship Channel Marker 17

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 15
Bacteria	4	
Field	4	

14865 – Middle of Bay

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 15
Bacteria	4	
Field	4	

Impairments and Concerns

There are no impairments or concerns on this segment.

Active Wastewater Permits

There are no active wastewater permits in this segment.

2494 – Brownsville Ship Channel

1.5 square miles.

2006 Monitoring

14871 – At East End of Turning Basin

Parameter	Frequency	Agency
24hr DO	2	TCEQ Region 15
Conventional	4	
Bacteria	4	
Field	4	

14875 – At Entrance to San Martin

Parameter	Frequency	Agency
Metals in Water	2	TCEQ Region 15
Metals in Sediment	2	
Conventional	4	
Bacteria	4	
Field	4	

2494 – Brownsville Ship Channel (continued)

13460 – Near Ship Channel Marker 35 (Black Buoy)

Parameter	Frequency	Agency
Metals in Water	2	TCEQ Region 15
Metals in Sediment	2	
Conventional	4	
Bacteria	4	
Field	4	

Impairments

There are no impairments on this segment.

Concerns

There is a concern for depressed DO in the turning basin. 24-hour DO measurements are being collected at two stations in order to help determine the pollutant source for this concern.

Active Wastewater Permits

WQ0002597-000 – Brownsville Navigation District: 100,000 gpd via evaporation.

WQ0002817-000 – Brownsville Navigation District Fishing Harbor

WQ0003936-000 – Valley MUD No. 2

WQ0004126-000 – Texas Pack: 150,000 gpd via irrigation.

WQ0004466-000 – Lone Star Hatchery, Inc.: 500,000 gpd: pipeline to Port Isabel Turning Basin to Port Isabel Channel to Brownsville Ship Channel. (Not plotted on map.)

WQ0010332-001 – Brownsville Navigation District Northside Plant: 98,000 gpd: drainage ditch to Brownsville Ship Channel.

WQ0010350-001 – Laguna Madre Water District Port Isabel Plant: 1,100,000 gpd: tidal mud flat to Vadia Ancha to Brownsville Ship Channel.

WQ0010397-005 – Brownsville Public Utilities N. Robindale Plant: 10,000,000 gpd: Cameron County Drainage Ditch No.1 to San Martin Lake to the Brownsville Ship Channel.

WQ0010590-002 – City of Los Fresnos: 1,000,000 gpd: unnamed ditch to Los Fresnos West Ditch of Cameron County Drainage Ditch District (CCDD) No.1 to Main Ditch No. 2 of CCDD No. 1 to San Martin Lake to Brownsville Ship Channel.

WQ0011348-001 – Valley MUD No. 2: 400,000 gpd.

2494 – Brownsville Ship Channel (continued)

WQ0013041-001 – John Frias (St. Francis of Assisi)

WQ0013817-001 – Olmito WSC (Olmito Plant): 750,000 gpd: pipeline to CCDD No. 1 Main Ditch No. 2 to San Martin Lake to Brownsville Ship Channel.

WQ0014355-001 – Brownsville Navigation District: 100,000 gpd: unnamed ditch to CCDD No. 1 Main Ditch No. 2 to San Martin Lake to Brownsville Ship Channel. (Not plotted on map.)

2494A – Port Isabel Fishing Harbor (unclassified water body)

0.2 square miles.

2006 Monitoring

13285 – At Hwy 100 Bridge

Parameter	Frequency	Agency
Metals in Water	2	TCEQ Region 15
Metals in Sediment	2	
Conventional	4	
Bacteria	4	
Field	4	

Impairments and Concerns

There are no impairments or concerns on this segment.

Active Wastewater Permits

There are no active wastewater permits in this segment.

2501 – Gulf of Mexico

The lower gulf is divided into three assessment units; the Port Aransas area, the Port Isabel area, and the Port Mansfield area.

2006 Monitoring

Port Isabel Area

13470 – At Port Isabel, Just Beyond Jetties at Bell Buoy

Parameter	Frequency	Agency
Conventional	4	TCEQ Region 15
Bacteria	4	
Field	4	

2501 – Gulf of Mexico (continued)

Impairments

Based on data from DSHS, all areas are listed as having an impairment for mercury in King Mackerel > 43 inches long. The source of the mercury is attributed to atmospheric deposition. Additional data and information will be collected before a TMDL is scheduled.

Concerns

There are no concerns on this segment.

Active Wastewater Permits

There are no active wastewater permits in this segment.

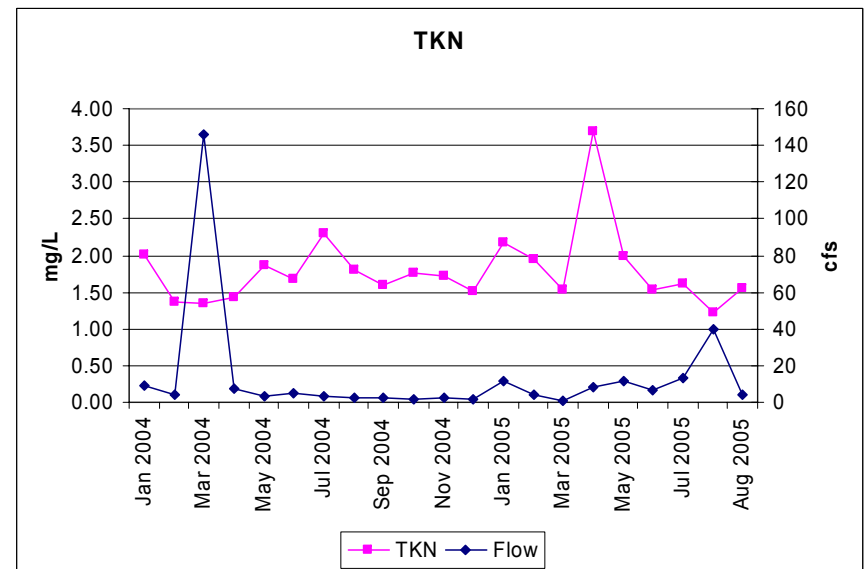
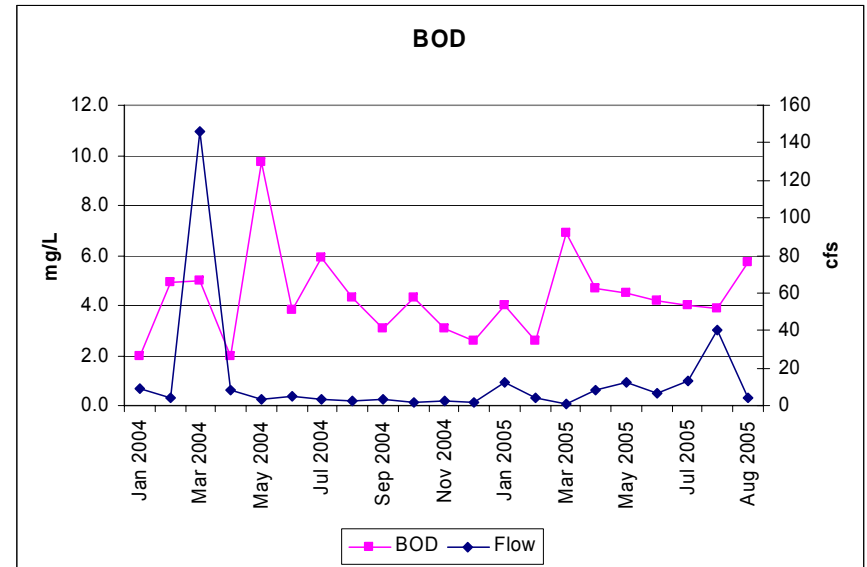
SPECIAL STUDIES

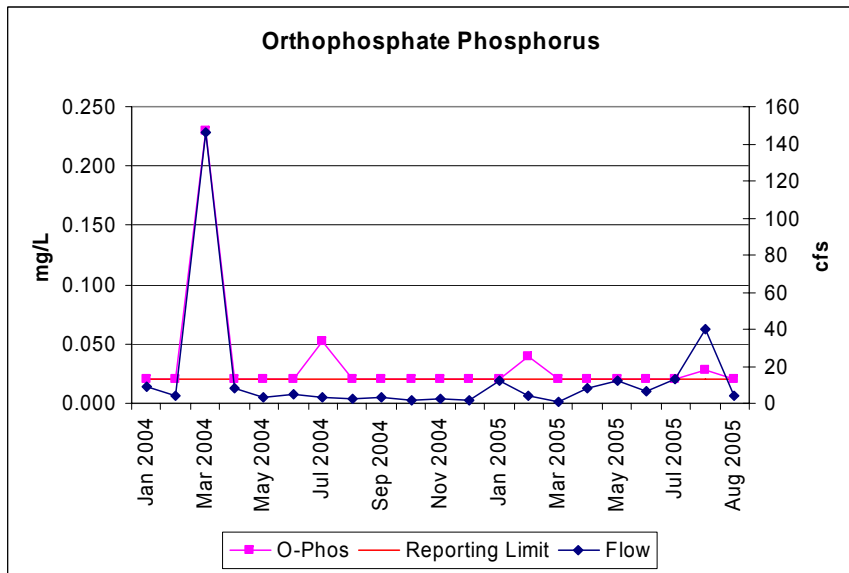
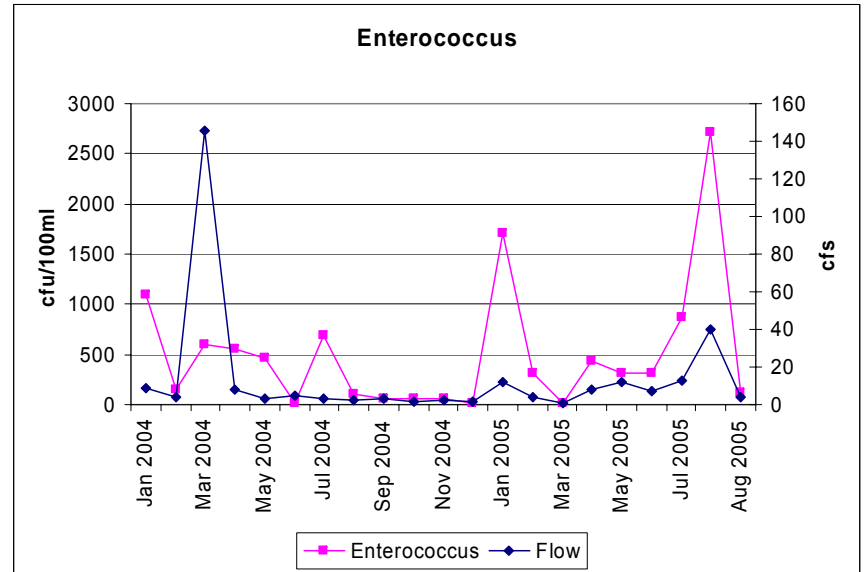
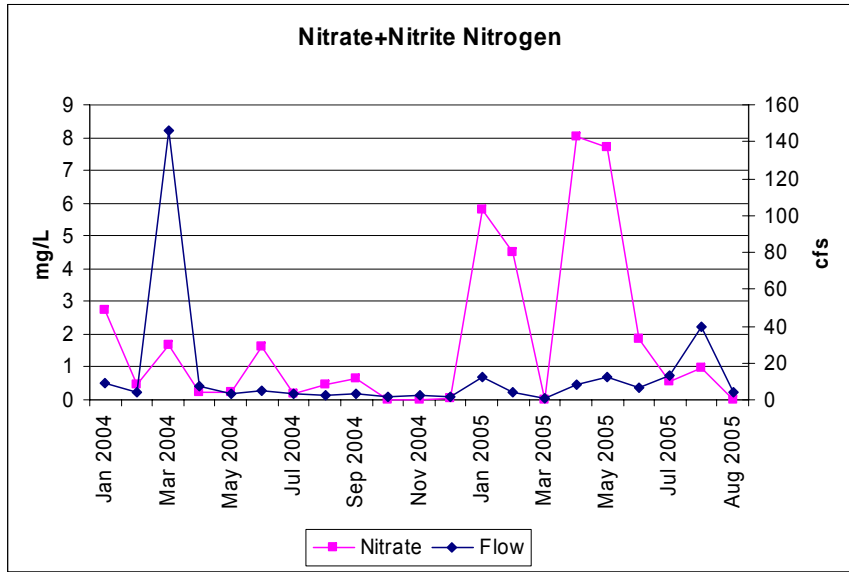
Cameron County NPS Monitoring Project

In August 2005, NRA completed a 20 month special study monitoring water quality on a tributary to the Arroyo Colorado and Laguna Madre in Cameron County. Originating in the Green Valley Farms *colonia*, a significant water pollution problem caused by non-point source (NPS) water pollution was suspected. NPS pollution is any combination of man-made pollutants such as fertilizers, herbicides, pesticides, toxic chemicals from urban runoff, bacteria from faulty septic systems, and animal waste. It comes from discrete sources in the environment and most often occurs as storm water moves over land picking up contaminants and transporting them to receiving waters. The Green Valley Farms *colonia* was suspected of contributing bacteria to receiving waters during periods of high flow due to failing septic systems.

NRA collected data including stream flow, field, and laboratory data on a monthly basis at one location from January 2004 through August 2005. There was an additional attempt to sample during high flow events. The regular March 2004 sampling took place during a high flow event. Two samples were taken in July 2005, the second one to capture high flow due to Tropical Storm Emily. In addition to conventional laboratory tests, biological oxygen demand (BOD), total Kjeldahl nitrogen (TKN), and orthophosphate phosphorus were added to better assess the quality of water. The study was initially slated as monitoring project to collect data before the construction of a proposed retention facility and wetland treatment system. However, funding for the construction phase of the wetland was not secured and the study concluded after the initial 20 month assessment period. Data gathered were presented at a conference entitled "Emerging Technologies for a Sustainable Environment" that took place in South Padre Island on October 20, 2005.

The following graphs show the recorded values for flow, BOD, TKN, nitrate+nitrite nitrogen, orthophosphate phosphorus, and Enterococcus from January 2004 through August 2005.





STAKEHOLDER PARTICIPATION

CRP depends on public involvement and input from stakeholders to assist in understanding the needs of the basins and the areas of concern. The NRA steering committee serves as the focus for public input and assists with:

- Creation of specific achievable water quality objectives and basin priorities
- Review and development of work plans and allocation of resources
- Development and review of major reports
- Establishing monitoring priorities and developing monitoring plans
- Improving awareness of water quality, water resource, and pollutant source issues
- Increasing opportunities for citizens to identify pressing issues, concerns, and contributing ideas to the CRP process
- Expanding the public's role in water quality management issues

The steering committee includes stakeholder volunteers from across NRA's area of responsibility, representing:

- Private citizens
- Fee-payers (identified in Texas Water Code TWC 26.0135(h))
- Political subdivisions (including local, regional, and state officials)
- State Soil and Water Conservation Board
- Other appropriate state agencies including: TPWD, Texas Water Development Board, TGLO, DSHS, Texas Department of Agriculture, Texas Railroad Commission, and TxDOT.
- Other entities interested in water quality matters including: TCEQ regional staff, business and industry, agriculture, environmental and other public interest groups.

NRA encourages stakeholder participation to provide suggestions for additional monitoring, special studies, outreach opportunities, and to be a voice for local concerns. For more information about stakeholder participation, the steering committee process, or how to become a steering committee member, visit our Public Involvement web page at <http://www.nueces-ra.org/CP/CRP/public.php>, or contact NRA using the contact information at the end of this report.

PUBLIC OUTREACH

NRA participated in numerous CRP supported activities to help educate students on pollution sources, the importance of keeping our waters clean, and what they can do help protect our rivers, lakes, and bays.

Leadership Guidance and Support for Teachers

In 2005, NRA visited 12 schools over a period of 22 days. Presentations on NPS pollution were given and NPS demonstrations were conducted using a watershed model. NRA, working with the Texas State Soil and Water Conservation Board (TSSWCB), has acquired a watershed model of the Nueces River Basin. 1809 students participated in these events. NRA also participated in six water quality field trips with 160 students.

Nueces County Cooperative Extension

For the past three years NRA outreach staff have participated in the Nueces County Ag Fair, an education event sponsored by the local Texas Cooperative Extension office. The events draws hundreds of 3rd and 4th graders from Nueces County elementary schools. Students participate in an NPS demonstration using the Texas Watch watershed model. Following the 2004 Ag Fair, Cooperative Extension staff members were trained in the presentation and have borrowed the model for demonstration to volunteers who will carry the watershed protection message to others in Nueces County. This kind of partnering will help meet the watershed education needs in rural underserved areas of NRA's area of responsibility. Partnering relationships with Texas Cooperative Extension and Soil and Water Conservation Districts continue to develop and promise to lead to more outreach and education opportunities.

Earth Day Bay Day

NRA participates at the Earth Day Bay Day Celebration held each year in April. In past years, NRA has demonstrated the use of monitoring equipment to educate the public about environmental operations at NRA; created posters to show sampling stations locations and parameters information; demonstrated how to check on water quality in the basin using the tools found on our website; and demonstrated the watershed model.

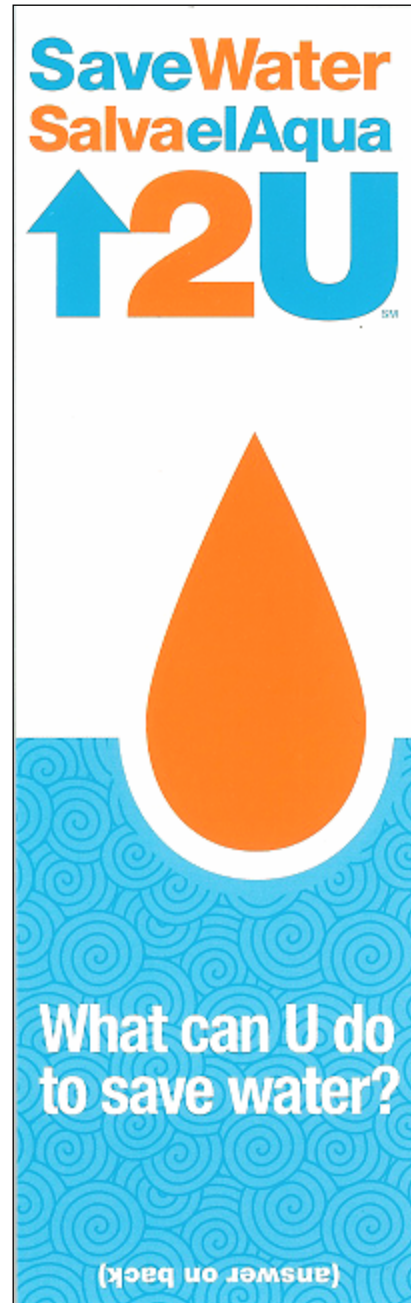
Water World

In May 2005, NRA participated in a community outreach function called Water World sponsored by the City of Corpus Christi. Located inside the Corpus Christi Museum of Science and History, Water World was a one day event that offered the public a chance to talk with agencies and other entities that are associated with anything water related. NRA set up a booth to inform the public about the role NRA plays in water planning, monitoring, and education. Various tools of the trade were exhibited and demonstrated to show how data are collected and how to access the data from a personal computer.

NRA has also been involved in a Headwaters Stewardship Project, funded by EPA through TSSWCB, which focuses on the rivers of the Upper Nueces Basin. Though not funded by CRP, the activities related to this project compliment CRP outreach.

As part of the project, NRA has hosted an annual conference on land stewardship and water resources. This year's topic, "Managing Land for Healthy Watersheds and Clean Rivers" drew 150 attendees. Conference supporters included: local Soil and Water Conservation Districts, local Groundwater Districts, Rio Grande Nueces RC&D, Texas Cooperative Extension, Natural Resource Conservation Service and the Texas Wildlife Association.

Another component of the Headwaters Stewardship Project is the "Up To You" river litter prevention campaign organized and launched in cooperation with the Friends of the Frio, Zavala County, Nueces Canyon Chamber of Commerce, First State Bank of Uvalde, the Uvalde HEB food store and over 50 other local businesses. The campaign logo and message are designed to create personal responsibility for clean, litter free rivers.



Easy Water Saving Actions for Kids... and Parents!

Turn water off when brushing your teeth.

Run full loads of laundry and dishes.

Use a broom to clean driveways and sidewalks, not a hose.

Take short showers or shallow baths.

Trash is for the trashcan, not the toilet. Toss it, don't flush it.

Water lawns early in the morning or in the evening to prevent water loss through evaporation.

Pass these water-saving tips on to others.

More information on water conservation is available from your local river authority.

Guadalupe-Blanco River Authority
www.gbra.org

San Antonio River Authority
www.sara-tx.org

Nueces River Authority
www.nueces-ra.org



In light of the worsening drought conditions, NRA has partnered with the San Antonio River Authority and the Guadalupe – Blanco River Authority produce an educational bookmark (at left) which utilizes the Up to You message of personal responsibility to raise public awareness about the need for water conservation: "Salva el Agua - Save Water."

Website

The NRA CRP main web page is located at <http://www.nueces-ra.org/CP/CRP>. This page contains links to information about CRP in general, and to specific information with respect to NRA's role in CRP including:

303(d) List – www.nueces-ra.org/CP/CRP/303d.php

Summary: This lists the 2004 Final 303(d) List of Impaired Water Bodies for the Nueces - Rio Grande Coastal Basin, Nueces River Basin, and the San Antonio - Nueces Coastal Basin

Water Quality Database -- <http://www.nueces-ra.org/cgi-bin/SW/access.cgi>

Summary: Sampling data may be retrieved on this page by: Station ID, date range, county, basin or segment.

Meeting Notices -- <http://www.nueces-ra.org/ALL/calendar.php>

Summary: Shows upcoming events/meetings and their details for CRP and other environmental related activities.

Monitoring Schedules -- <http://cms.lcra.org>

Summary: Coordinated Monitoring Schedules for all Texas CRP and SWQM monitoring schedules. A mapping function has been incorporated in this site.

Quality Assurance Project Plans -- <http://www.nueces-ra.org/CP/CRP/>

Summary: The Quality Assurance Project is used to delineate organization policy, structure and procedures which will be used to verify and validate the water quality data collected under the Texas Clean River Act (Senate Bill 818). This will ensure proper practices and collections to maintain quality assured data.

Steering Committee Information -- http://www.nueces-ra.org/CP/CRP/steering_committee/

Summary: This page hosts links to the Summaries and Presentations of Annual Meetings, a list of the members, and a Steering Committee Input web form.

Public Outreach -- <http://www.nueces-ra.org/CP/CRP/public.php>

Summary: Shows many important resource links to internal and external sites that help aid in resource protection, and public education.

Reports -- <http://www.nueces-ra.org/CP/CRP>

Summary: Includes current and historical reports such as the Basin Highlights Reports and Basin Summary report.

The CRP water quality database maintained by NRA contains water quality information about all the SWQM stations within the basins and any available sampling data. The database is updated monthly with any new data in the TCEQ database. The user is able to request information for any SWQM station based on the SWQM number directly or from a list of stations based on those sampled

(1) within a given date range, (2) within a specific county, (3) within a specific basin, or (4) on a specific segment. The station page contains location information and options for sampling data, either by sampling date or by parameter code.

CONTACT INFORMATION

Please contact us for more information on CRP, other activities of NRA, or to obtain additional copies of this report.

General Office

*First State Bank Bldg, Suite 206
200 E. Nopal - P.O. Box 349
Uvalde, Texas 78802-0349
Tel:830-278-6810 - Fax:830-278-2025*

Sky Lewey, Public Outreach Associate
slewey@nueces-ra.org

EMAIL

Coastal Bend Division

*Natural Resources Center
6300 Ocean Drive Unit 5865
Corpus Christi, Texas 78412 - 5865
Tel:361-825-3193 - Fax:361-825-3195*

Rocky Freund, Deputy Executive Director
rfreund@nueces-ra.org

Jew-Lee Lann, Information Systems Coordinator
jlann@nueces-ra.org

Sam Sugarek, Aquatic Resource Specialist
ssugarek@nueces-ra.org

APPENDICES

Monitoring Type	Parameters
Conventional	Total Suspended Solids Volatile Suspended Solids Total Dissolved Solids Alkalinity Sulfate Chloride Chlorophyll-a Pheophytin Ammonia Nitrate+Nitrite Total Organic Carbon Total Phosphorus Turbidity Orthphosphate Hardness ¹
Bacteria	E. coli ¹ Enterococcus ²
Metals in Water (All Dissolved)	Aluminum Arsenic Chromium Copper Lead Manganese Nickel Selenium Silver Zinc

Appendix 1. Sampling Parameters

Monitoring Type	Parameters
Field	pH Dissolved Oxygen Conductivity Salinity ² Temperature Secchi Depth Days since last rainfall Flow ³ Flow measurement method ³ Flow severity ³ Air temperature Wind direction Wind intensity Present Weather Water Color Water Odor Water Surface Turbidity Tide Stage ² Rainfall 1 day prior Rainfall 7 days prior Maximum pool width ⁴ Maximum pool depth ⁴ Pool length ⁴ % Pool coverage ⁴ Total depth
¹ Measured only at fresh water stations ² Measured only at marine and tidal stations ³ Measured only at non-tidal stream stations ⁴ Measured only at perennial pool	

Appendix 2. Sampling Parameter Descriptions

(Please refer to <http://www.nueces-ra.org/CP/CRP/sparameters.doc> for more information about these parameters.)

Alkalinity – measures the buffering capacity of water which helps a solution resist changes in pH caused by the addition of an acid or base thereby maintaining an appropriate pH range for aquatic habitat

Bacteria – measures the amount of pathogens (E. coli in fresh water, Enterococci in marine water) present in the water

Biochemical Oxygen Demand – the measure of the amount of oxygen that is consumed in the biological processes that break down organic matter in water and is used to determine the relative oxygen requirements of wastewaters, effluents, and polluted waters

Chlorides – measures the ionize, water soluble form of chlorine present in the water

Chlorophyll-a – the photosynthetic pigment found in all green plants, algae, and cyanobacteria, the concentration is used to estimate phytoplankton biomass in surface water

Conductivity - is the measure of electrical current carrying capacity of water and is used to measure the amount of dissolved solids and salts in the water

Dissolved Oxygen - the amount of oxygen available to aquatic organisms and is the single most important indicator of a water body's ability to support desirable aquatic life

Hardness - measures divalent ions, salts such as calcium and magnesium, in association with carbonates

Metals – (Aluminum, Arsenic, Cadmium, Chromium, Copper, Lead, Manganese, Mercury, Nickel, Selenium, Silver and Zinc) - certain metals, like Mercury, have been found to bioaccumulate in the tissues of fish making them unsafe to eat - metals may be found in water and sediment

Nitrogen (Ammonia, Nitrate, Nitrite) – measures the nutrient levels in the water related to the decomposition of organic material

Orthophosphate - measures the amount of dissolved phosphorus which is immediately available to plants or algae

pH – measures the acidity of the water which affects the solubility, and therefore the toxicity, of chemicals and metals

Pheophytin – a degradation product of chlorophyll-a that is used to determine a more accurate measure of chlorophyll-a

Salinity - monitored at tidal streams, bays and estuaries only, and derived from conductivity and water temperature

Secchi Depth - measures the clarity or transparency of water

Sulfate – measures the amount of water soluble sulfur present in the water

Total Dissolved Solids – measures the amount of minerals, salts, metals, cations or anions dissolved in the water

Total Organic Carbon – measures the amount of carbon covalently bound in organic compounds in a water sample which affects biogeochemical processes, nutrient cycling, biological availability, chemical transport and interactions

Total Phosphorus – measures all chemical forms of phosphorus

Total Suspended Solids – measures the amount of all particles suspended in water which will not pass through a filter

Turbidity - measures the clarity or cloudiness of water

Volatile Suspended Solids – measures the amount of solids lost on ignition (heating to 500° C) which gives an approximation of the amount of organic matter present in the solid fraction of wastewater, activated sludge and industrial wastes

Water temperature – affects the metabolic rates of aquatic organisms and plants