Nueces River Authority

Basin Highlights Report

Nueces River Basin

San Antonio-Nueces Coastal Basin

Nueces-Rio Grande Coastal Basin

May 2004

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

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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; 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.

In August 2003, NRA published a comprehensive Basin Summary Report that went into much detail regarding basin characteristics and trends, concerns, and impairments of all 43 TCEQ segments within the basins. Recognizing the relatively short time period between reports, this Basin Highlights Report serves as a supplement and update to the Basin Summary Report. It focuses on the current monitoring plan and any significant differences between the water quality information in Basin Summary Report and the results of the Draft 2004 303(d) List and Water Quality Inventory (released for review on January 23, 2004). The full Basin Summary Report can be accessed on the NRA website at http://www.nueces-ra.org/CP/CRP/reports/2003BasinSummary/.

BASIN HIGHLIGHTS

Another Wet Year

South Texas once again saw a very wet year in 2003. Major flooding occurred in July and October over much of the area. Hurricane Claudette hit the Texas Coast near Port Lavaca in July, bring rain to the San Antonio – Nueces Coastal Basin. The Lake Corpus Christi/Choke Canyon Reservoir in the Nueces River Basin remained at near full capacity for the entire year, resulting in over 600,000 acre feet of freshwater inflows into the Nueces Bay Estuary. Record rainfall closed portions of US 281 in the Nueces – Rio Grande Coastal Basin. The Laguna Atascosa in the Laguna Atascosa Wildlife Refuge in Cameron County filled after being dry for almost five years.

Significant rainfall and runoff are well known sources of non-point source (NPS) pollution. However, and perhaps due the extraordinary about of fresh water that has flowed into the bays and estuaries over the past two years, many stations that had increasing trends for alkalinity, salinity, and total organic carbons (TOC) now have no trends for those parameters. One station in Corpus Christi Bay has even gone from an increasing trend to a decreasing trend with respect to salinity. Fresh water streams also a have fewer number of increasing trends for several parameters. The results of a post Basin Summary Report trend analysis are discussed in more detail in the Water Quality Data Review section of this report.

Additional Monitoring

NRA has added metals in water and metals in sediment sampling to six sites located in Choke Canyon Reservoir, Lake Corpus Christi, and the Nueces River between the two lakes. These samples will be taken twice during fiscal year (FY) 2004. The Lake Corpus Christi / Choke Canyon Reservoir System is the primary source of drinking water for the City of Corpus Christi and their regional customers. TCEQ is trying to collect enough metals data to perform a metals assessment for these segments. Currently, none of these segments have concerns or impairments for any metals.

NRA is also assisting TCEQ Region 15 with 24-hour dissolved oxygen (DO) monitoring at three sites on the Arroyo Colorado. A Total Maximum Daily Load (TMDL) project is currently underway for DO in the tidal portion of the stream. DO is also a concern in the non-tidal portion of the stream.

More information on the monitoring scheduled for FY 2004 can be found in the Overview of Water Quality Monitoring and Water Quality Data Review sections of this report.

Steering Committee Process and Outreach Activities

The steering committee process is important to the success of CRP. It serves as the focus for public input which is then used to help set priorities for the program. Due to the large geographic area under NRA's area of responsibility for CRP, steering committee meetings are held in three locations in order to accommodate as many members as possible and to be able to focus on more specific interests that exist between the regions. Meetings are held in Uvalde, to serve the Upper Nueces River Basin, in Corpus Christi, to serve the Lower Nueces River Basin and adjoining Coastal Basins, and in Weslaco to serve the Lower Nueces – Rio Grande Coastal Basin.

NRA has been participating in numerous activities to help educate students on pollution sources, the importance of keeping our waters clean, and what they can to do help protect our rivers, lakes, and bays. These include coordinating and/or participating in river-based field days, providing guidance and support for field education activities, and distributing the "How We Keep Our Waters Clean" activity, created by TCEQ, to elementary schools.

SB 155 / HB 305

In the Upper Nueces River Basin, use of off-road vehicles in state-owned riverbeds had become an increasingly popular pass-time for hundreds of off-road enthusiasts. Off-roaders used the streambed as a trail and forged through fish beds, degrading sensitive riparian and aquatic habitat. In many areas, it had displaced traditional river recreation (canoeing, picnicking, swimming, snorkeling, and fishing) due to safety concerns.

The 78th Session of the Texas Legislature passed Senate Bill 155 and its companion, House Bill 305, banning, with limited exceptions, the use of any motorized vehicle in a state-owned riverbed. Support for this legislation came from numerous state, local, and private entities concerned with conserving Texas' natural resources. NRA Board of Directors also supported this legislation. The bill was signed by Governor Rick Perry on June 20, 2003 and took effect September 1, 2003. The ban on vehicles in the river beds went into effect on January 1, 2004.

OVERVIEW OF WATER QUALITY MONITORING

NRA coordinates with TCEQ's TMDL team and Surface Water Quality Monitoring (SWQM) personnel from Regions 13, 14, and 15 every spring to develop the monitoring schedule for the next fiscal year. This coordination allows each entity to maximize their sampling efforts by avoiding duplication of effort, and assuring that the parameters needed for assessment are being collected at the required stations.

Data for TMDLs are also being collected by the Conrad Blucher Institute for Surveying and Science (CBI) at Texas A&M University – Corpus Christi (TAMU-CC) (segments 2104, 2107, and 2113), EA Engineering (segment 2204), and the Center for Coastal Studies (CCS) at TAMU-CC (segments 2485 and 2491).

A total of 114 different stations are being monitoring during FY 2004 by eight different entities: 33 involving TMDLs and eight involving special studies. The locations of all monitoring sites are shown in Figure 1. The boxes on this map represent the extent of the maps shown in Figures 2 through 7. A detailed list of stations, the type monitoring being performed, the monitoring entity, and the monitoring frequency are included in the Water Quality Data Review section of this report. Routine monitoring consists of conventional and field parameters, bacteria, and flow. 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.

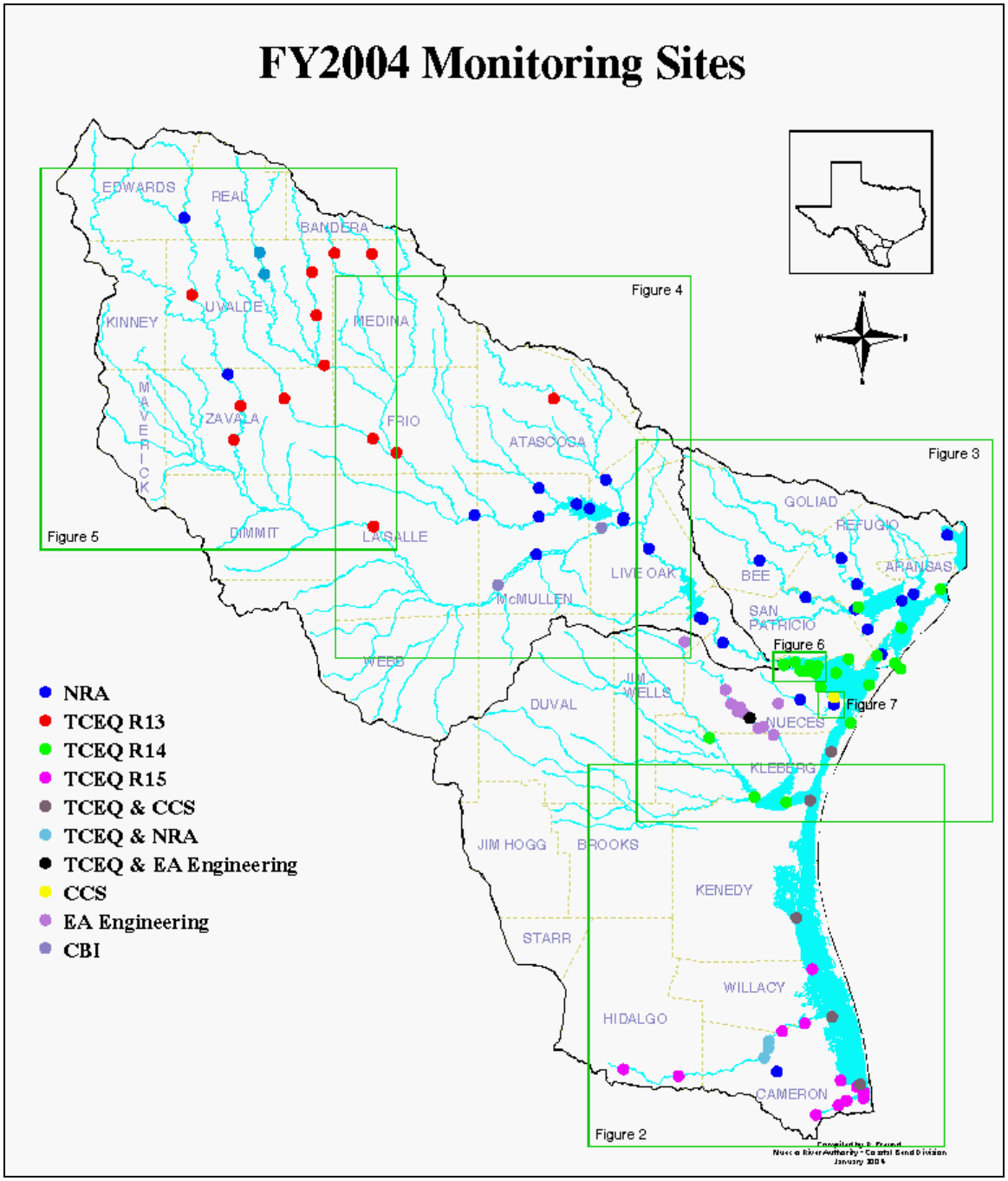

Figure 1. 2004 Monitoring Sites

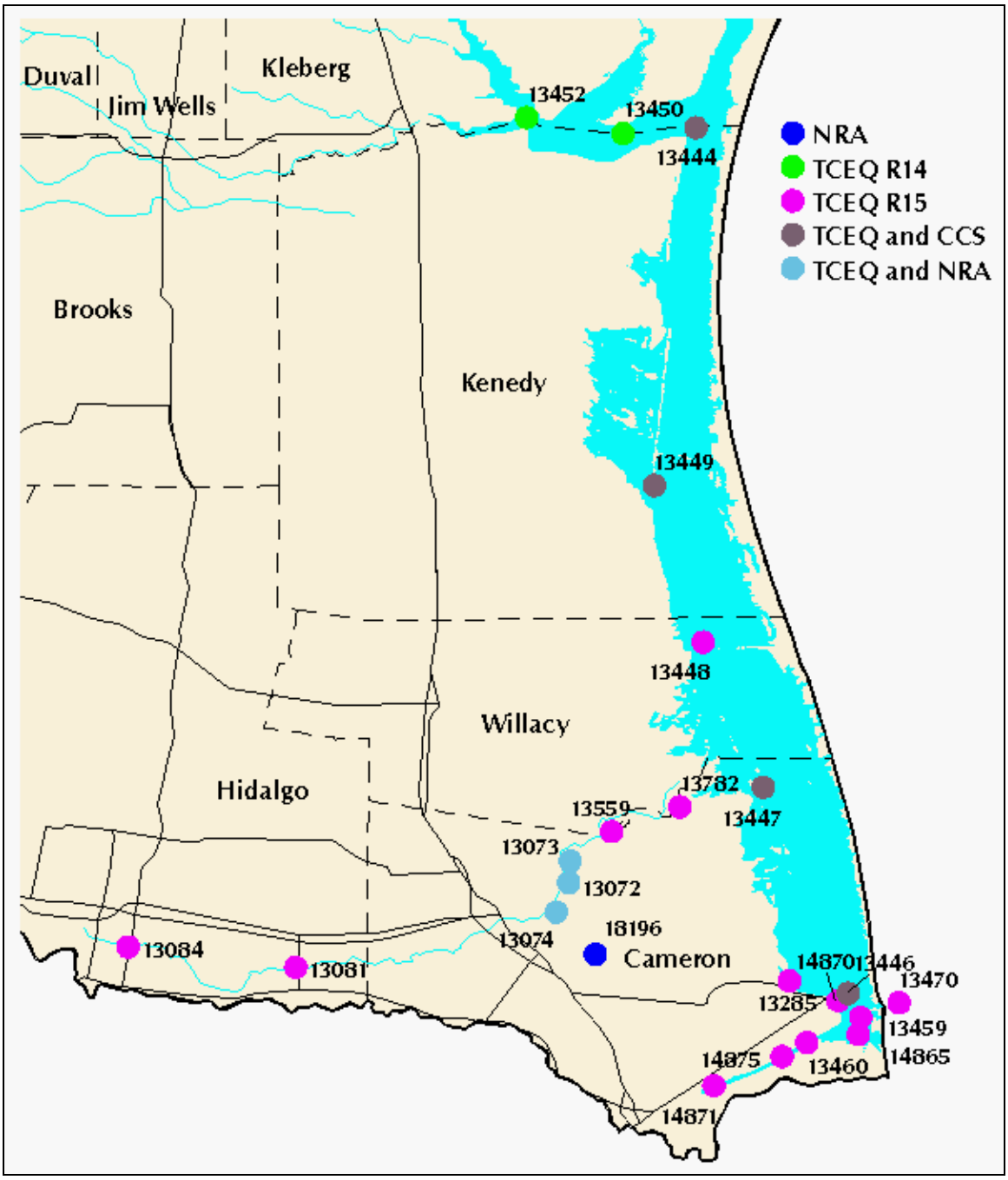

Figure 2. 2004 Monitoring Sites – Lower Nueces – Rio Grande Coastal Basin

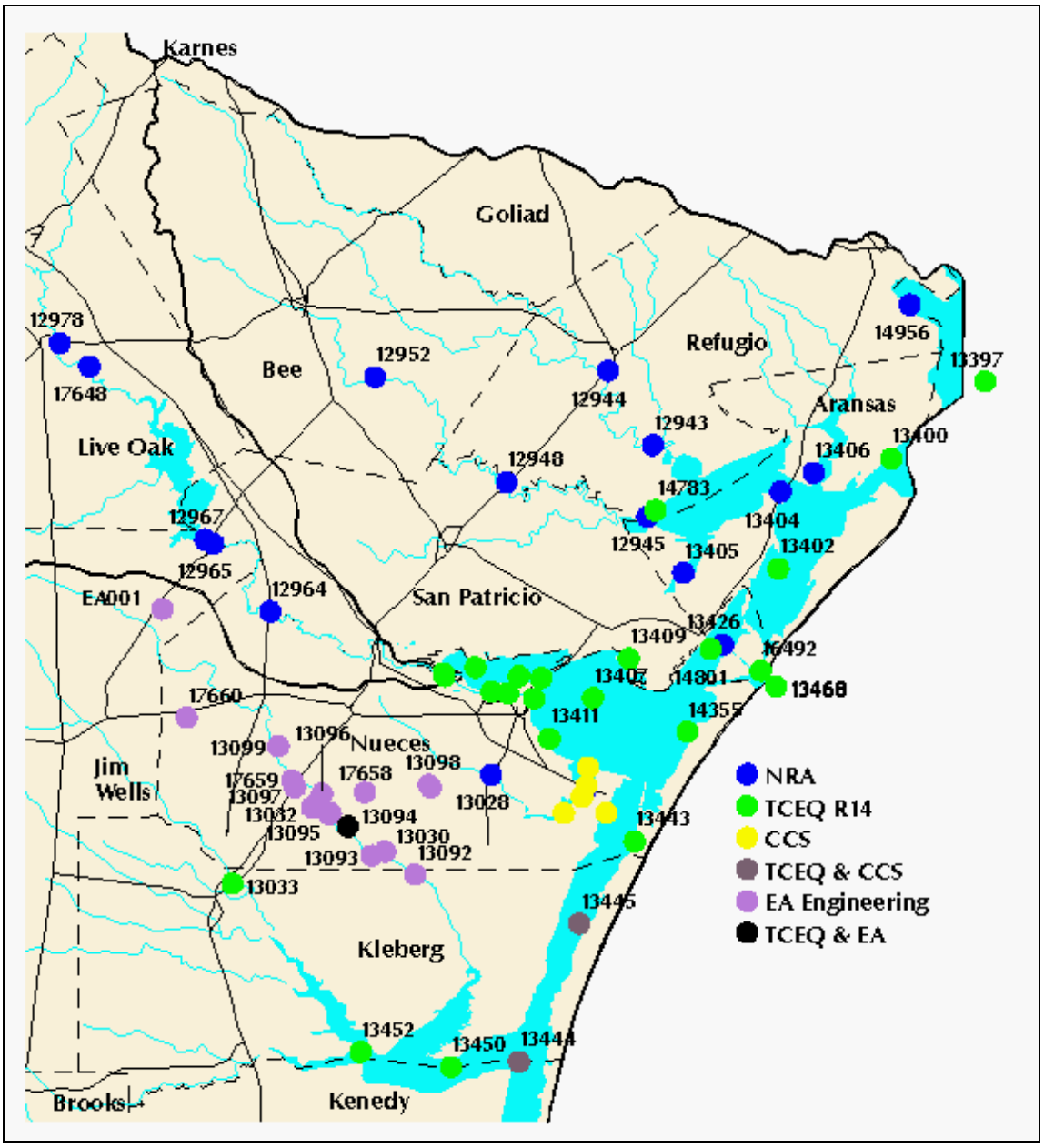

Figure 3. 2004 Monitoring Sites – Lower Nueces River Basin and Adjoining Coastal Basins

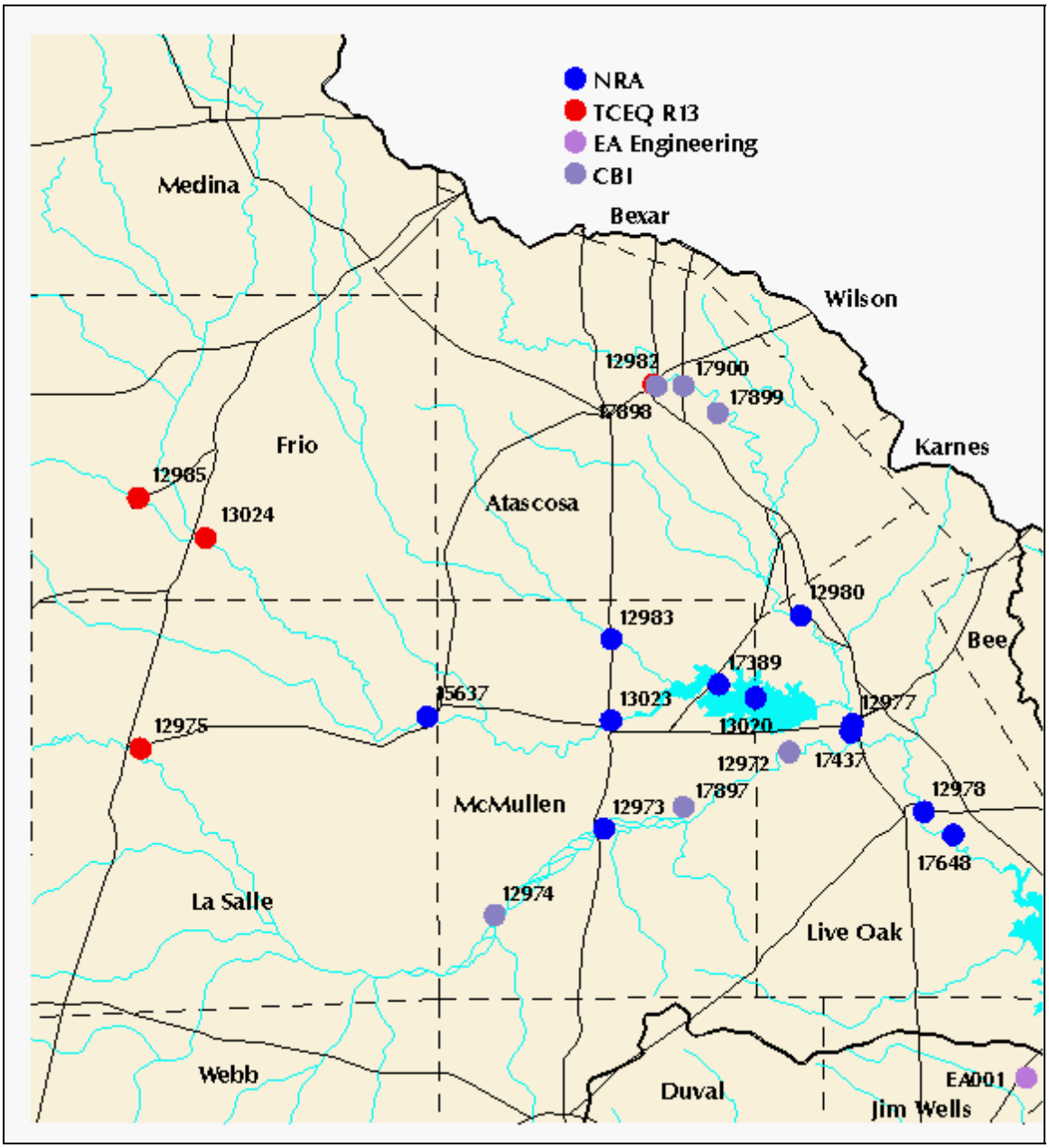

Figure 4. 2004 Monitoring Sites – Middle Nueces River Basin

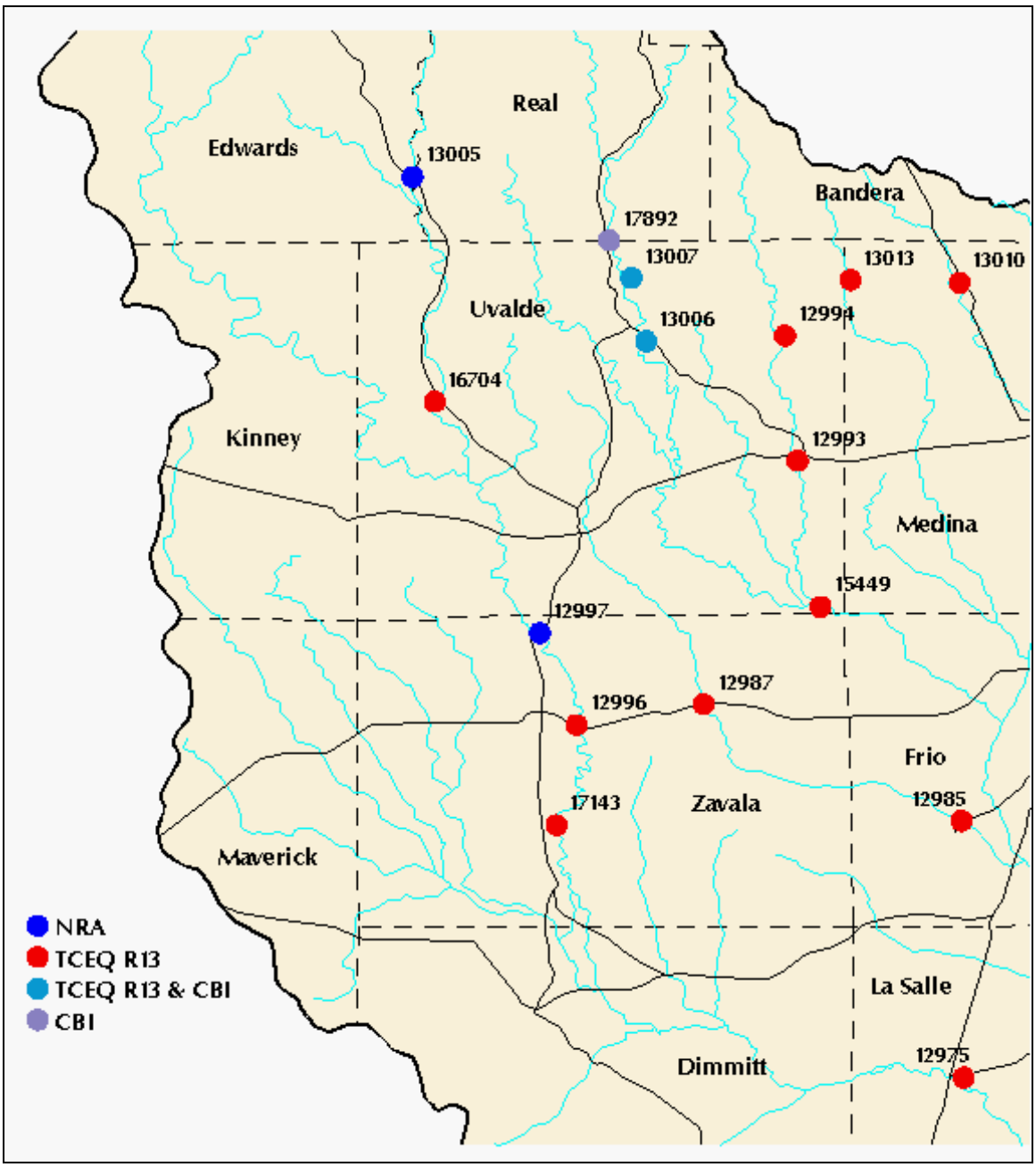

Figure 5. 2004 Monitoring Sites – Upper Nueces River Basin

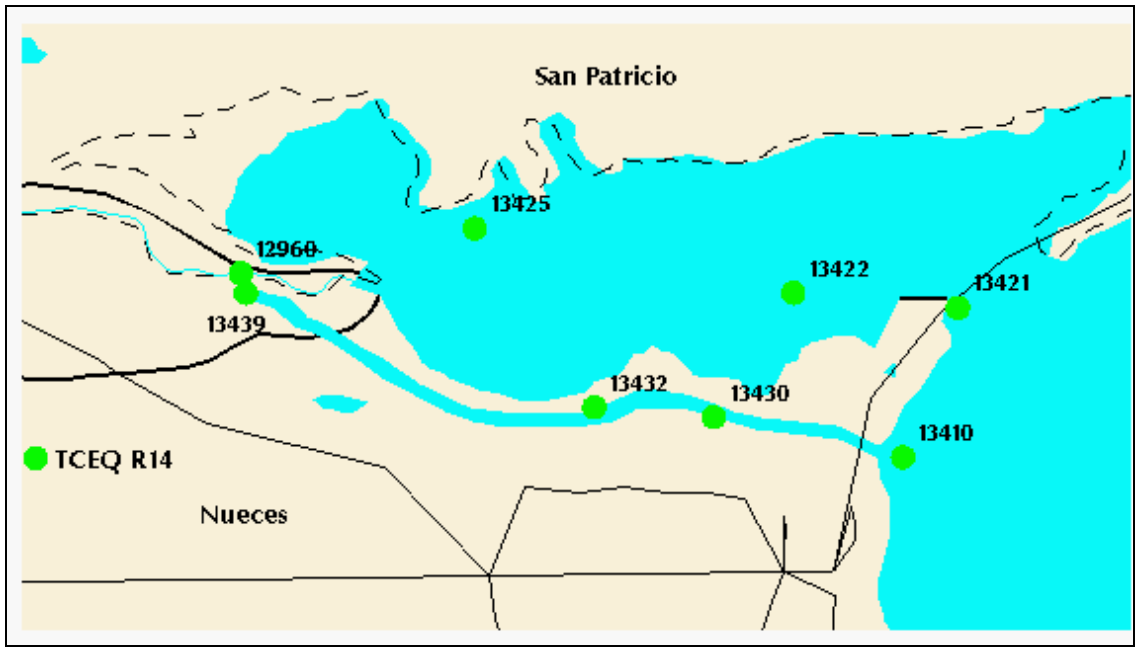

Figure 6. 2004 Monitoring Sites – Nueces Bay and Corpus Christi Ship Channel

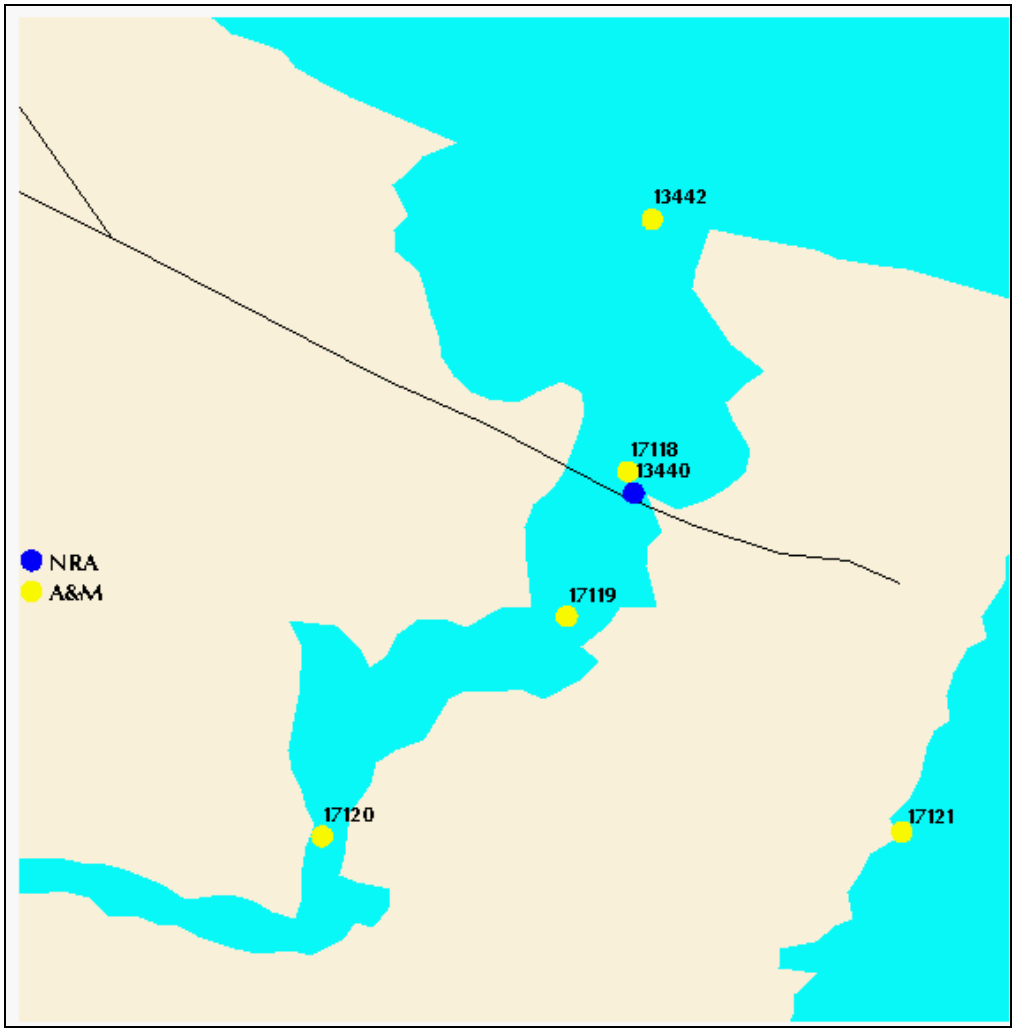

Figure 7. 2004 Monitoring Sites – Oso Bay

TOTAL MAXIMUM DAILY LOAD PROGRAM

A TMDL is:

- The maximum amount of a pollutant that a lake, river, stream, or estuary can receive and still maintain Texas Surface Water Quality Standards.
- A detailed water quality assessment that provides the scientific foundation for an implementation plan.
- An implementation plan that outlines the steps necessary to reduce pollutant loads in a certain body of water to restore and maintain human uses or aquatic life.

The development of TMDLs and implementation plans is, in many cases, the best method to improve water quality. All states are required by Section 303(d) of the 1972 Federal Clean Water Act (CWA) to develop TMDLs for water bodies that are impaired (too polluted to maintain their beneficial uses). The list of the lakes, rivers, streams, and estuaries in Texas that may need TMDLs and implementation plans is published by the TCEQ in the State of Texas Water Quality Inventory and 303(d) List.

Federal regulations prohibit the addition of certain new sources and new discharges of pollutants to waters listed on the *Texas 303(d) List* until a TMDL is established. Under federal law, if Texas does not develop its own TMDLs, the U.S. Environmental Protection Agency (EPA) must develop them.

TMDLs are developed by TCEQ staff or independent contractors working for the agency through a scientifically rigorous process of intensive data collection and analysis. Implementation plans are the basis for initiating local, regional, and state actions that reduce pollutant loads to levels established in TMDLs.

An example of an action that might be taken is making wastewater permit limits more stringent. This may require wastewater treatment plants for communities and industry to implement additional and sometimes costly new treatment technology. Alternatively, farmers and ranchers may be asked to use new practices which prevent fertilizers, manure, and pesticides from reaching lakes and rivers. Cities may be required to control and treat runoff from their streets. If the controls are found to be inadequate, then the implementation plan will be revised and more stringent measures may be adopted.

Local input in the TMDL process is essential to determining which controls will be the most effective to implement. For more information about TMDLs visit the TCEQ's Website at **http://www.tnrcc.state.tx.us/water/quality/tmdl/index.html**, or contact NRA for specific information on TMDLs in NRA's basins of responsibility.

TMDLs that are currently underway or have been recently completed are discussed below:

Bacteria and Dissolved Oxygen in South Central Texas
(http://www.tnrcc.state.tx.us/water/quality/tmdl/SC_bac_DOproject.html)
Segment 2104 – Nueces Above Frio River
In the 25 miles surrounding SH 16, the segment is partially supporting for DO. TMDL and 24-hour DO monitoring is scheduled at three sites under the TMDL being performed by CBI.

Segment 2107 - Atascosa River TMDL
In the lower 25 miles of the there are impairments for bacteria and DO. Additional data have been collected under a TMDL being performed by CBI which confirms the initial assessment. Data will continue to be collected at three stations under the TMDL.

Segment 2113 – Upper Frio River
In the 25 miles surrounding SH 127, the segment is partially supporting for DO. TMDL and 24-hour DO monitoring is scheduled at three sites under the TMDL being performed by CBI.

Arroyo Colorado TMDL Watershed Steering Committee
(http://www.tnrcc.state.tx.us/water/quality/tmdl/arroyo_group.html)
Segment 2201 – Arroyo Colorado Tidal
This segment has an impairment for DO in the upper 7.1 miles of the reach. The results of additional TMDL sampling indicate that a 90% reduction in loading would be required to meet state standards, which is not realistically achievable. Therefore, a Watershed Action Plan, which provides the means for achieving the goals of the Clean Water Act without having to establish an official TMDL, is being developed for the entire Arroyo Colorado watershed.

Arroyo Colorado Legacy TMDL Project
(http://www.tnrcc.state.tx.us/water/quality/tmdl/arroyoleg.html)
Segment 2202 – Arroyo Colorado Above Tidal
This segment has an impairment for pesticides in fish tissue. The Texas Department of Health (TDH) issued a fish consumption ban in June 1993. A TMDL for the pesticides has been completed, and the ban is now limited to small mouth buffalo fish as of June 2001.

Segment 2202A – Donna Reservoir TMDL for Legacy Pollutants
This segment has an impairment for PCBs (polychlorinated biphenyls) in fish tissue. TDH issued a fish consumption ban in April 1994. A TMDL for PCBs has been completed, re-enforcing the ban.

Dissolved Solids in the Brazos, Colorado, and Nueces-Rio Grande Basins
(http://www.tnrcc.state.tx.us/water/quality/tmdl/colorado_sangabriel_project.html)
Segment 2204 – Petronila Creek Above Tidal – Chloride, Sulfate, and Total Dissolved Solids (TDS)
The impaired reach of the segment is south and east of US 77 which flows through historic oil and gas fields. The reach north and west of US 77 meets the standards. Initial studies indicate that the pollutants are entering the water from groundwater seepage into the stream beds. TMDL monitoring is scheduled at 14 sites under the TMDL being performed by EA Engineering.

Assessing the Oyster Waters Use
(http://www.tnrcc.state.tx.us/water/quality/tmdl/gulfcoastoyster.pdf)
Segment 2462 – San Antonio Bay and Segment 2472 – Copano Bay
A TMDL, led by TDH, is currently underway for bacteria in oyster waters to track the sources of the bacteria. This project is expected to be completed in December 2004.

Nueces Bay Zinc Project (http://www.tnrcc.state.tx.us/water/quality/tmdl/NuecesBayZinc.html)
Segment 2482 – Nueces Bay
A TMDL for zinc in oyster tissue has recently been completed. The findings show that the zinc source is from an historic smelting plant, and that the bay is slowly recovering on its own.

Oso Bay Dissolved Oxygen
(http://www.tnrcc.state.tx.us/water/quality/tmdl/osobay.pdf)
Segment 2485 – Oso Bay
A TMDL for DO is continuing. TMDL and 24-hour DO monitoring is scheduled at four sites in Oso Bay under the TMDL being performed by CCS.

Segment 2491 – Laguna Madre
TMDL and 24-hour DO monitoring is scheduled at six sites in the Laguna Madre under the TMDL being performed by CCS.

WATER QUALITY DATA REVIEW

In August 2003, NRA published a comprehensive Basin Summary Report that went into much detail regarding basin characteristics and trends, concerns, and impairments of all 43 TCEQ segments within the basins (Figure 8). The full report can be accessed on the NRA website at http://www.nueces-ra.org/CP/CRP/reports/2003BasinSummary/.

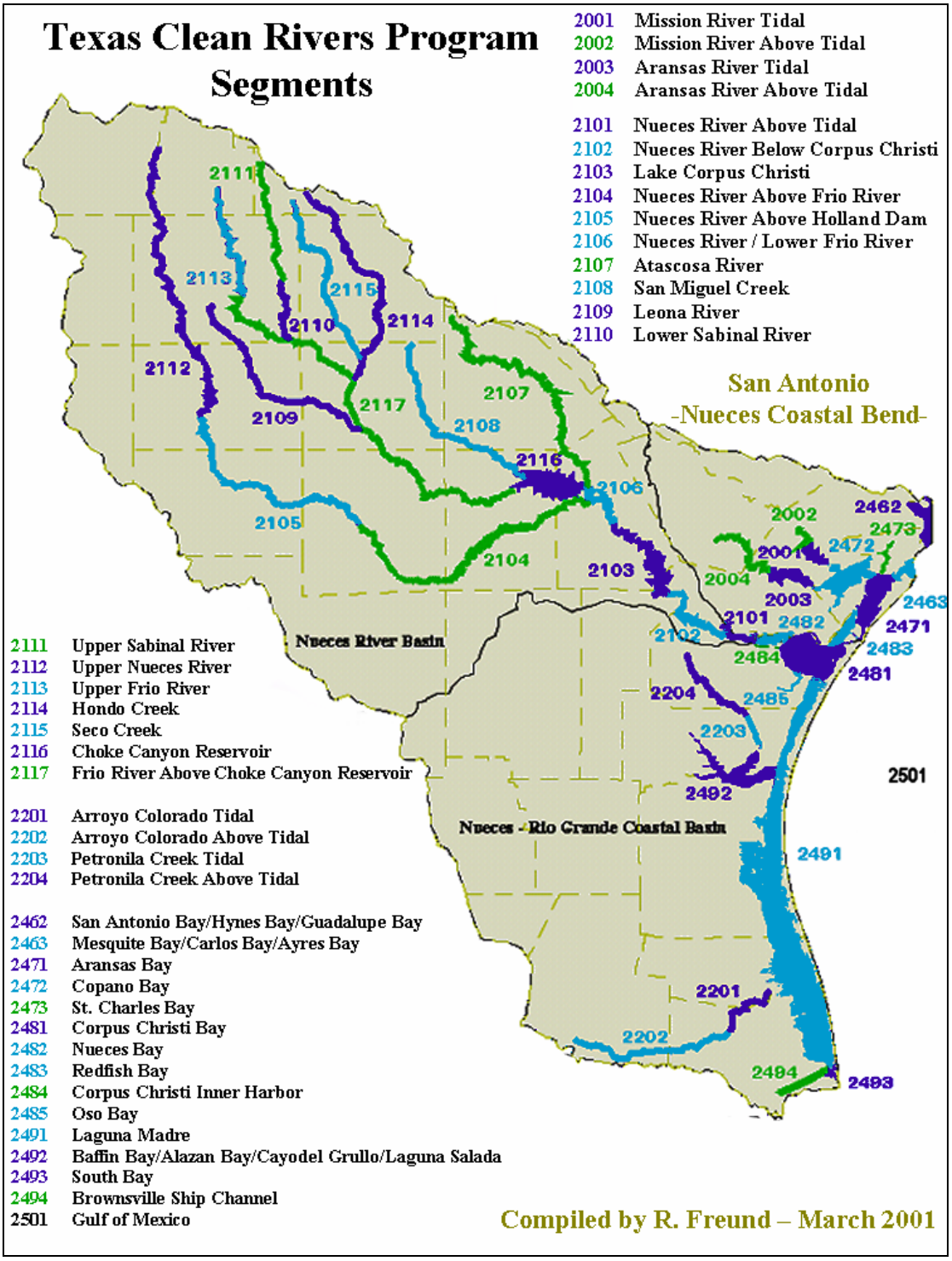

Figure 8. Segments in NRA's Area of Responsibility

The concerns and impairments discussed in the Basin Summary Report were based on the 2002 303(d) List. The Draft 2004 303(d) List and Water Quality Inventory (released for review on January 23, 2004) were used to update the information in this report. The 2002 assessment was based on data from March 1, 1996 to February 28, 2001. The 2004 assessment was based on data from March 1, 1998 to February 28, 2003.

A concern is a designation assigned to a water body for a specific parameter where the percentage of measured values exceeding the Texas State Water Quality Standards (TSWQS) is between 10% and 25%. An impairment is a designation assigned to a water body for a specific parameter where the percentage of measured values exceeding the TSWQS is greater that 25%.

It is important to note that for 2004, the TCEQ conducted a targeted water quality assessment of only 182 water bodies (out of the 731 assessed in 2002). These targeted water bodies were identified as concerns in 2002 because the data set for them was too small to allow for a full assessment, but a number of measurements indicted the segments did not meet the criteria defined in the standards. These 182 targeted water bodies have been prioritized for more intense monitoring over the last two years and the 2004 Inventory provides an up-to-date status for them. The 2004 assessment addressed about 11% of its Texas' total river miles, 80% of lake acres, 85% of bay square miles, and 100% of the Gulf square miles within its jurisdiction.

Because of the very large number of total river miles in the state (191,288 miles) and limited resources to direct to monitoring, Texas can only assess a small percentage of its rivers in comparison to the number of lakes and estuaries that are assessed. However, the most important river segments, and those at the highest risk for pollution, are targeted for assessment every year. TCEQ staff use a strategy for choosing the segments that is designed to make the coverage as representative of the state as possible. The following segment summaries identify whether the segment was last fully assessed in either 2002 or 2004.

The 2004 assessment removed bacteria as a concern in two segments; 2002 – Mission River above Tidal and 2106 – Nueces/Lower Frio River. Some organic compounds in fish tissue were removed as concerns in 2202 – Arroyo Colorado above Tidal.

The 2004 assessment added elevated nutrients as a concern in 2485 – Oso Bay, and changed the status of bacteria from concerns to impairments in five segments; 2001 – Mission River Tidal, 2003 – Aransas River Tidal, 2107 – Atascosa River, 2473 – St. Charles Bay, and 2485 – Oso Bay.

The trend analysis in the Basin Summary Report contained data from January 1993 through August 2002. For those stations for which additional data are available, the trend analysis has been re-run for those parameters showing increasing trends to see if there were any significant changes. (The data used for trend analysis does not necessarily correspond to the data used for assessments.)

Statistically, a trend indicates an overall change in value over time. With respect to this report, an increasing trend indicates that the measured values of a specific parameter are increasing over time. This trend may serve as a warning that a possible concern or impairment could develop for this parameter.

Each segment in NRA's are of responsibility is discussed below. Each segment summary focuses on any significant differences between the water quality information in Basin Summary Report and the results of the Draft 2004 303(d) List and Water Quality Inventory. The 303(d) List assigns a category to each impairment. The following categories are used in the segment discussions below:

- 4a – A TMDL has been completed and approved by EPA.
- 5a –A TMDL is underway, scheduled, or will be scheduled.
- 5b – A review of the water quality standards for this water body will be conducted before a TMDL (detailed water quality assessment) is scheduled.
- 5c – Additional data and information will be collected before a TMDL (implementation plan) is scheduled.

Please refer to the Basin Summary Report for more detailed information regarding concerns, impairments, and trend analysis. Additional information for this report includes a list of wastewater discharge permittees and the monitoring sites for FY 2004 in each segment.

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Segment 2001 - Mission River Tidal (Figure 3)

2004 Assessment

The 2002 assessment listed this segment as having a concern for bacteria, but there was not enough data to make a full assessment. Additional data now indicates that there is an impairment for bacteria (5c).

Trend Analysis

There is no longer an increasing trend for Volatile Suspended Solids (VSS), and there were no other parameters with increasing trends in this segment.

Wastewater Discharge Permittees

City of Woodsboro

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12943	FM 2678 Bridge Between Refugio and Bayside	Routine	4	NRA

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Segment 2002 - Mission River Above Tidal (Figure 3)

2004 Assessment

The segment is still listed as having a concern for depressed DO. 24-hour DO monitoring is continuing in this segment.

The 2002 assessment listed this segment as having a concern for bacteria, but there was not enough data to make a full assessment. Additional data now indicates that there is no concern.

Trend Analysis

There is no longer an increasing trend for Total Organic Carbon (TOC), but increasing trends remain for DO Deficit and VSS.

Wastewater Discharge Permittees

Town of Refugio
Pettus Municipal Utility District (MUD)

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12944	US 77-Upstream From Bridge at Refugio	Routine 24-Hour DO	4 4	NRA

Segment 2003 - Aransas River Tidal (Figure 3)
2004 Assessment
The 2002 assessment listed this segment as having a concern for bacteria, but there was not enough data to make a full assessment. Additional data now indicates that there is an impairment for bacteria (5c).

The segment is still listed as having a concern for orthophosphorus.

Trend Analysis
An increasing trend remains for VSS.

Wastewater Discharge Permittees
City of Sinton (City and Welder Park)
City of Odem
Texas Department of Transportation (TXDOT)
St. Paul Water Supply Corporation (WSC)

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12948	At US 77 Bridge Between Woodsboro and Sinton	Routine	4	NRA

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Segment 2004 - Aransas River Above Tidal (Figure 3)
2002 Assessment (Not assessed in 2004)
The segment is listed 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 correct location has again been sampled since July2002. The incorrect location was assigned a new SWQM number and assigned to those sampling results. Therefore, there were only 3 samples for the Aransas River during the assessment period, which are not enough data points to determine whether or not there is an actual DO concern on this segment.

Wastewater Discharge Permittees
City of Beeville (City and Chase Field)
Skidmore WSC
Tynan WSC

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12952	At County Road East of Skidmore	Routine	4	NRA

Segment 2101- Nueces River Tidal (Figure 5)
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having a concern for chlorophyll a.

Trend Analysis
There are no longer increasing trends for Total Kjeldahl Nitrogen (TKN), chloride nor sulfate. There were no other parameters with increasing trends in this segment.

Wastewater Discharge Permittees
City of Corpus Christi (Allison Plant)
San Patricio County MUD No. 1
Central Power and Light Company (Lon C. Hill Power Station)

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12960	North of Viola Turning Basin	Routine 24-Hour DO	4 1	Region 14

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Segment 2102- Nueces River Below Lake Corpus Christi (Figure 3)
2002 Assessment (Not assessed in 2004)
No concerns or impairments.

Wastewater Discharge Permittees
Wright Materials, Inc.
Knolle Cattle Company

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12964	At Bluntzer Bridge on F 666	Routine	4	NRA
12965	At La Fruta Bridge, SH 359			

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Segment 2103- Lake Corpus Christi (Figures 3 and 4)
2002 Assessment (Not assessed in 2004)
No concerns or impairments.

Wastewater Discharge Permittees
City of Mathis
City of George West

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12967	Mid-Lake at the Dam	Routine Metals in Water Metals in Sediment	4 2 2	NRA
17648	At Live Oak CR 151 near River Creek Acres Upstream of Lake Corpus Christi	Routine	4	NRA

Segment 2104 - Nueces River Above Frio River (Figure 4)
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having a potential impairment for depressed DO (5c), but there was not enough data to make a full assessment. This segment is included in the Bacteria and Dissolved Oxygen in South Central Texas TMDL.

The segment is listed as having a concern for chloride and total dissolved solids (TDS).

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12972	Bridge on County Road 1.2 Miles North of Simmons	Aquatic Habitat Benthics Nekton Field 24-Hour DO	3 3 3 7 7	CBI TMDL
12973	At SH 16 South of Tilden	Routine	4	NRA
12974	At Fm 624	Aquatic Habitat Benthics Nekton Field 24-Hour DO	3 3 3 7 7	CBI TMDL
12897	Approx. 13.9km Downstream of SH 16 on Smith Lease			

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Segment 2105 – Nueces River Above Holland Dam (Figures 3 and 4)
2002 Assessment (Not assessed in 2004)
No concerns or impairments.

Trend Analysis
There are no longer increasing trends for Total Suspended Solids (TSS) or VSS. There were no other parameters with increasing trends in this segment.

Wastewater Discharge Permittees
City of Crystal City
City of Carrizo Springs
City of Cotulla
City of Asherton
City of Big Wells
Zavala County (Crystal City Land Fill)

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12975	At IH 35 South of Cotulla	Routine	4	Region 13

Segment 2106 - Nueces/Lower Frio River (Figures 3 and 4)

2004 Assessment

The 2002 assessment listed this segment as having a concern for bacteria, but there was not enough data to make a full assessment. Additional data now indicates that there is no concern.

Trend Analysis

There are no longer increasing trends for pH nor dissolved barium, but increasing trends remain for conductivity and dissolved copper.

Wastewater Discharge Permittees

Valero Refining Company
City of Three Rivers

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12977	At US 72 in Three Rivers	Routine Metals in Water Metals in Sediment	4 2 2	NRA
12978	At US 59 East of George West			
17437	Approx. 1 mi Downstream of SH 72 in Three Rivers Near Diamond Shamrock Outfall	Routine Organics in Water Metals in Water Metals in Sediment	4 4 2 2	NRA

Lower Frio River at US 72 in Three Rivers, Texas

Segment 2107 - Atascosa River (Figure 4)
2004 Assessment
The 2002 assessment listed this segment as having a possible impairment for bacteria, but there was not enough data to make a full assessment. Additional data now indicates that there is an impairment (5c).

This segment was also listed as having a potential impairment for depressed DO (5b), but there was not enough data to make a full assessment.

This segment is included in the Bacteria and Dissolved Oxygen in South Central Texas TMDL.

Ammonia, chlorophyll a, and TDS remain concerns in the segment.

Wastewater Discharge Permittees
San Miguel Electric Coop, Inc.
City of Lytle
City of Jourdanton
City of Pleasanton (Atascosa River Facility)
City of Poteet

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12980	At FM 99 Bridge West of Whitsett	Routine	4	NRA
12982	At US 281 at Pleasanton	Routine	4	Region 13
17898	150 Meters Downstream of Hunt Road	Aquatic Habitat Benthics Nekton Field Bacteria 24-Hour DO	1 1 1 4 4 4	CBI TMDL
17899	500 Meters Southwest of Intersection of Leal Rd and Mopac Railroad	Aquatic Habitat Benthics	1 1	CBI TMDL
17900	At IH 37	Nekton Field Bacteria 24-Hour DO	1 2 4 4	

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Segment 2108 – San Miguel Creek (Figure 4)
2002 Assessment (Not assessed in 2004)
No concerns or impairments.

Wastewater Discharge Permittees
City of Charlotte
City of Devine
City of Natalia

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12983	At Sh 16 North Of Tilden	Routine	4	NRA

Segment 2109 –Leona River (Figures 4 and 5)
2002 Assessment (Not assessed in 2004)
The segment is listed as having concerns for nitrogen and sulfate.

Wastewater Discharge Permittees
City of Uvalde

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12985	At FM 1581 Southwest of Pearsall	Routine	4	Region 13
12987	At Hwy 57 Near Batesville	Routine	4	Region 13
		Metals in Sediment Organics in Sediment Fish Tissue	2 2 2	Region 13 Special Study

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Segment 2110 – Lower Sabinal River (Figure 5)
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having an impairment for nitrogen (5a), and is considered a high priority.

Wastewater Discharge Permittees
City of Sabinal

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12993	Bridge On Us 90 West Of Sabinal	Routine	4	Region 13

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Segment 2111 – Upper Sabinal River (Figure 5)
2002 Assessment (Not assessed in 2004)
No concerns or impairments.

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12994	12.5 Miles North of Sabinal and 2.3 Miles Downstream From the Mouth of Onion Creek	Routine	4	Region 13

Segment 2112 – Upper Nueces River (Figure 5)
2002 Assessment (Not assessed in 2004)
No concerns or impairments.

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12996	US 57 South of Uvalde	Routine	4	Region 13
12997	US 83 Bridge South of Uvalde	Routine	4	NRA
13005	At SR-55, South of Barksdale			
16704	At SH55 Bridge, 2.5km South of Laguna	Routine	4	Region 13
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			

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Segment 2113 – Upper Frio River (Figure 5)
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having a possible impairment for depressed DO (5c), but there was not enough data to make a full assessment. This segment is included in the Bacteria and Dissolved Oxygen in South Central Texas TMDL.

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13006	At SH 127 East of Concan	Routine	4	Region 13
		Aquatic Habitat Benthics Nekton Field 24-Hour DO	1 1 1 2 4	CBI TMDL
13007	At Magers Crossing	Routine	4	Region 13
		Aquatic Habitat Benthics Nekton Field 24-Hour DO	1 1 1 2 4	CBI TMDL
17892	At Apache Bluffs 0.5km Upstream of FM 1120	Aquatic Habitat Benthics Nekton Field 24-Hour DO	1 1 1 2 4	CBI TMDL

Segment 2114 – Hondo Creek (Figure 5)
2002 Assessment (Not assessed in 2004)
No concerns or impairments.

Trend Analysis
There is no longer an increasing trend for VSS, but an increasing trend remains for alkalinity.

Wastewater Discharge Permittees
City of Hondo

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13010	Downstream From Bridge on Ranch Road 462 Near Tarpley	Routine	4	Region 13

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Segment 2115 – Seco Creek (Figure 5)
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having a concern for temperature.

Trend Analysis
There is no longer an increasing trend for temperature, but an increasing trend remains for TKN.

Wastewater Discharge Permittees
Medina County Water Control and Improvement District (WCID) 002

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13013	At Miller Ranch Near Utopia	Routine 24-Hour DO	4 2	Region 13

Upper Nueces River at US 83 south of Uvalde, Texas

Segment 2116 – Choke Canyon Reservoir (Figure 4)

2004 Assessment

The segment is listed as having an impairment for TDS (5c). There is a direct connection between water level and TDS in Choke Canyon. As described in the introduction of the Basin Summary Report, this region suffered its worst drought of record from 1993 to July 2002. Analysis of the reservoir from March 1999 to July 2002 showed that the during this time period, the water level dropped 16 feet, and dropped from 51.3% of capacity to 35.6% of capacity. During this same time period, calculated TDS levels rose from 427 to 940. In August 2002, the reservoir was full, and the calculated TDS was 224. This is a naturally occurring problem, compounded by the City of Corpus Christi's Reservoir System operating procedure which doesn't allow for the system to be flushed unless there is a flood event. A formal request has been made to TCEQ to change the criteria for TDS for this segment based on this information.

The segment is still listed as having an impairment for bacteria (5c).

The segment is still listed as having a concern for depressed DO. 24-hour DO monitoring is continuing in this segment.

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13020	Mid-Lake on Live Oak/McMullen County Line (Near Old Hwy 99)	Routine Metals in Water Metals in Sediment	4 2 2	NRA
17389	Approx 0.5 km Southeast of RR 66 Southern Most Bridge Crossing the Frio River Arm	Routine 24-Hour DO	4 4	NRA

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Segment 2117 – Frio River Above Choke Canyon Reservoir (Figures 4 and 5)

2004 Assessment

The segment remains listed as having an impairment for bacteria (5c).

Chloride, TDS, depressed DO, nitrogen and chlorophyll a remain listed as concerns in this segment.

Trend Analysis

There is no longer an increasing trend for temperature, and there were no other parameters with increasing trends in this segment.

Wastewater Discharge Permittees

City of Pearsall
City of Dilley (City and prison facility)
McMullen County WCID No. 1

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13023	At SH 16 in Tilden	Routine	4	NRA
13024	At US 35 North of Dilley	Routine 24-Hour DO	4 4	Region 13
15449	At FM 187 South Of Sabinal	Routine	4	Region 13
15637	At Fowlerton	Routine 24-Hour DO	4 2	NRA

Segment 2201 – Arroyo Colorado Tidal (Figure 2)

2002 Assessment (Not assessed in 2004)

The 2002 assessment listed this segment as having a potential impairment for depressed DO (5c). The results of TMDL sampling indicate that a 90% reduction in loading would be required to meet state standards, which is not realistically achievable. Therefore, a Watershed Action Plan, which provides the means for achieving the goals of the Clean Water Act without having to establish an official TMDL, is being developed for the entire Arroyo Colorado watershed.

The 2002 assessment also listed this segment as having concerns for nitrogen, and ammonia.

Trend Analysis

There are no longer increasing trends for conductivity, chloride, and TDS. There are still two out of three increasing trends for TOC.

Wastewater Discharge Permittees

Taiwan Shrimp Village Association (Aquaculture Facility)
Southern Star Inc.
City of Rio Hondo
City of Pharr

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13072	FM 106 Bridge at Rio Hondo	Routine	4	Region 15
		24-Hour DO	2	NRA
13073	At Camp Perry North of Rio Hondo	Routine	4	Region 15
		24-Hour DO	2	NRA
13559	At Marker 27 (Mile 15) 0.5 Mile North of the Point Where Channel Becomes Boundary Between Willacy And Cameron Counties	Routine	4	Region 15
13782	Near CM 16 at Arroyo City, KM 10.9	Routine Metals in Water	4 4	Region 15
18196	Unnamed Drainage Ditch Approximately 842 m South of FM 510 and 403 m West of Adams Rd, East of San Benito, Just Downstream of Proposed Wetland Facility	Routine	8	NRA Special Study

Segment 2202 – Arroyo Colorado Above Tidal (Figure 2)
2004 Assessment
The segment remains listed as having impairments for bacteria (5c), DDE (dichlorodiphenylethane) in fish tissue (4a), and for DDT (dichlorodiphenyl-trichloroethane) and other organochloride pesticides in smallmouth buffalo (4a). A TMDL for the pesticides has been completed, and the TDH ban on fish consumption is now limited to small mouth buffalo fish.

Ammonia, nitrogen, orthophosphorus, total phosphorus, chlorophyll a, and depressed DO remain listed as concerns.
Trend Analysis
There are no longer increasing trends for DO Deficit or TKN. There is still one out of two increasing trends for orthophosphorus. There are still two out of three increasing trends for TOC. There are still increasing trends for total phosphorus and fecal coliform.

Wastewater Discharge Permittees
Central Power and Light Company (La Palma Power Station)
City of San Benito
City of Harlingen (Plant No. 1 and Plant No. 2)
City of McAllen
City of La Feria
City of Hidalgo
City of San Juan
Winter Garden Park Corporation
City of Mission
Fruit of the Loom (will be shutting down)

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13074	At Low Water Bridge at Port Harlingen	Routine	4	Region 15
		Metals in Sediment Organics in Sediment	2	Region 15 Special Study
		24-Hour DO	2	NRA
13081	Main Floodway In Llano Grande At Fm 1015 South Of Weslaco	Routine	4	Region 15
13084	AT US 281 South Of Pharr			

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Segment 2202A – Donna Reservoir
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having an impairment for PCBs in fish tissue (4a). TDH issued a fish consumption ban in April 1994. A TMDL for PCBs has been completed, re-enforcing the ban.

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Segment 2203 – Petronila Creek Tidal
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having an impairment for temperature. It has been determined that this impairment is not caused by a pollutant.

Chlorophyll a was also listed as a concern.

Segment 2204 – Petronila Creek Above Tidal (Figures 3 and 4)

2002 Assessment (Not assessed in 2004)

The 2002 assessment listed this segment as having impairments for chloride, sulfate, and total dissolved solids. Initial TMDL studies indicate that the pollutants are entering the water from groundwater seepage into the stream beds.

Chlorophyll a was also listed as a concern.

Wastewater Discharge Permittees

City of Agua Dulce
City of Orange Grove
City of Driscoll
Nueces Co. WCID No. 5
Coastal Bend Youth City
Bishop Consolidated Independent School District (Petronila Elementary)

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13030	Unnamed Tributary to Petronila Creek at FM 70 Near Stanolind-Luby Camp Refinery	Conventional Field	2 2	EA Engineering TMDL
13032	Unnamed Drainage Ditch Tributary to Petronila Creek at Beatty Rd, Enters Petronila Creek 2 Mi Downstream of FM 665			
13092	2.3 Miles Above Bridge at County Rd 51 on King Ranch, Just South of the Laurels Headquarters			
13093	At FM 70 East of Bishop			
13094	At FM 892 Southeast of Driscoll	Routine	4	Region 14
		Conventional Field	2 2	EA Engineering TMDL
13095	At Beatty Rd, 2.5 Mi Downstream of FM 665	Conventional Field	2 2	EA Engineering TMDL
13096	At FM 665 East of Driscoll			
13097	1/4 Mi Downstream of US 77, Below Driscoll Petroleum Outfall Pipe			
13098	At US 77 Bridge			
13099	At FM 2826 North of Driscoll			
17658	Petronila Elementary Domestic Wastewater Outfall Permit No. WQ0011754-001			
17659	Coastal Bend Youth City Domestic Wastewater Outfall Permit No. WQ0011689-001			
17660	City of Agua Dulce WWTP Outfall Permit No. WQ0010140-001			
EA001	City of Orange Grove - WQ0010592-001			

Segment 2462 – San Antonio Bay / Hynes Bay / Guadalupe Bay (Figure 3)
2004 Assessment
The segment remains listed as having an impairment for bacteria in oyster waters. A TMDL is being conducted by the TDH to track the sources of the bacteria.

Nitrogen, orthophosphorus, and total phosphorus remain listed as concerns.

Wastewater Discharge Permittees
Refugio WCID No. 1
City of Austwell

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13397	Intracoastal Canal at Buoy C-17	Routine	4	Region 14
14956	At Austwell at Texas Parks And Wildlife Public Boat Ramp	Routine	4	NRA

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Segment 2463 – Mesquite Bay / Carlos Bay / Ayres Bay (Figure 3)
2002 Assessment (Not assessed in 2004)
No concerns or impairments.

Trend Analysis
There is no longer an increasing trend for alkalinity, and there were no other parameters with increasing trends in this segment

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13400	South of Intracoastal Waterway Marker 13	Routine	4	Region 14

****

Segment 2471 – Aransas Bay (Figure 3)
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having a concern for bacteria in oyster waters.

Trend Analysis
There is no longer an increasing trend for alkalinity, but an increasing trend remains for chlorophyll a.

Wastewater Discharge Permittees
City of Rockport

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13402	Intersection of Intracoastal Canal and Lydia Ann Channel South of Rockport	Routine	4	Region 14
16492	In Lydia Ann Channel Directly West of Aransas Light House			

Segment 2472 – Copano Bay / Port Bay / Mission Bay (Figure 3)
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having an impairment for bacteria in oyster waters. A TMDL is being conducted by the TDH to track the sources of the bacteria.

Total phosphorus and depressed DO were also listed as concerns.

Trend Analysis
There is no longer an increasing trend for VSS, but an increasing trend remains for DO Deficit.

Wastewater Discharge Permittees
Town of Bayside
City of Taft

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
12945	At FM 136 Bridge South of Bayside	Routine	4	NRA
13404	West Side of Fishing Pier, Alongside SH 35			
13405	AT FM 881 West of Rockport	Routine 24-Hour DO	4 4	NRA
14783	1 Mile East of Bayside	Routine	4	Region 14

****

Segment 2473 – St. Charles Bay (Figure 3)
2004 Assessment
The 2002 assessment listed this segment as having a concern for bacteria, but there was not enough data to make a full assessment. Additional data now indicates that there is an impairment for bacteria.

Trend Analysis
There are no longer increasing trends for TSS, VSS, and Fecal coliform, but increasing trends remain for DO Deficit and alkalinity.

Wastewater Discharge Permittees
Aransas County MUD No. 1

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13406	Northeast of Goose Island State Park	Routine	4	NRA

Segment 2481 – Corpus Christi Bay (Figures 3 and 6)
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having a concern for bacteria in oyster waters.

Trend Analysis
There are no longer increasing trends for alkalinity, total phosphorus, salinity, chloride, and TDS. One of the stations went from have an increasing trend to having a decreasing trend. Increasing trends remain for TKN and TOC.

Wastewater Discharge Permittees
Koch Pipeline Company, L. P. (Ingleside Terminal)
E. I. Du Pont De Nemours & Co. (Ingleside Plant)
US Department of the Navy (Corpus Christi Naval Air Station)
Occidental Chemical Corporation (Corpus Christi Plant)
City of Gregory
City of Ingleside
Nueces Co. WCID No. 4 (Mustang Island North and South Plants)

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13407	At Corpus Christi Channel Marker #62	Routine	4	Region 14
13409	La Quinta Channel Marker 16	Routine Metals in Water	4 2	Region 14
		Metals in Sediment Organics in Sediment	2 2	Region 14 Special Study
13410	Near Corpus Christi Ship Channel Marker 86	Routine	4	Region 14
13411	1/2 Mile off Doddridge Road			
14355	Near Shamrock Point			

Sailling in Corpus Christi Bay
(Photo courtesy of the CorpusChristi-TX.net Web Site)

Segment 2482 – Nueces Bay (Figure 6)
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having an impairment for zinc in oyster tissue. A has recently been completed. The findings show that the zinc source is from an historic smelting plant, and that the bay is slowly recovering on its own.

Trend Analysis
There is no longer an increasing trend for alkalinity, and there were no other parameters with increasing trends in this segment

Wastewater Discharge Permittees
Central Power and Light Company (Nueces Bay Plant) (intermittent during peak periods)
City of Portland
Sublight Enterprises, Inc. (Portland Inn)

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13421	US 181 Bridge At Causeway (South Side)	Routine	4	Region 14
13422	1/2 Mile From South Shore at East Overhead Power Line	Routine Metals in Water	4 2	Region 14
13425	Near Whites Point	Routine	4	Region 14

****

Segment 2483 – Redfish Bay (Figure 3)
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having a concern for depressed DO. 24-hour DO monitoring is continuing in this segment.

Trend Analysis
There are no longer increasing trends for TSS and VSS, but an increasing trend remains for DO Deficit.

Wastewater Discharge Permittees
Liberty Seafood Inc.
Degussa Corporation (Aransas Pass Carbon Black)
Aker Gulf Marine (Two permits)
City of Aransas Pass
Tesoro Marine Services, Inc (Harbor Island Plant)

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13426	SH 361 at 3rd Bridge Between Aransas Pass and Port Aransas	Routine 24-Hour DO	4 4	NRA
14801	At The Intracoastal Waterway at Aransas Pass	Routine	4	Region 14

Segment 2483A – Conn Brown Harbor
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having an impairment for depressed DO.

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Segment 2484 – Corpus Christi Inner Harbor (Figure 6)
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having concerns for ammonia and nitrogen.

Trend Analysis
There are no longer increasing trends for alkalinity, TOC, and sulfate, and there were no other parameters with increasing trends in this segment

Wastewater Discharge Permittees
Encycle / Texas, Inc. (Corpus Christi Plant)
Elementis Chromium L.P. (Corpus Christi Facility)
Flint Hills Resources LP (Corpus Christi Refinery and Flint Hills)
Coastal Refining and Marketing (Corpus Christi Refinery and Coastal Refining and Marketing)
Citgo Refining and Chemicals (Corpus Christi Refinery, Corpus Christi Terminal and Citgo Refining and Chemicals)
Valero Refining Company-Texas (Corpus Christi Plant)
Williams Terminals Holdings (Corpus Christi Plant)
Equistar Chemicals LP (Oxy Petrochemicals Corpus Christi)
Applied Industrial Materials (Aimcor Terminal)
Koch Pipeline Company LP (Corpus Christi Terminal)
Trifinery Petroleum Services (Corpus Christi Plant)
Shamrock Logistics Operations (Diamond Shamrock Refining)
Javelina Company
Corpus Christi Cogeneration (Corpus Christi Energy Center)
City of Corpus Christi (Broadway Plant)

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13430	US 181 Bridge At Causeway (South Side)	Routine Metals in Water	4 2	Region 14
		Metals in Sediment Organics in Sediment	2 2	Region 14 Special Study
13432	Near Navigation Blvd. Draw Bridge	Routine	4	Region 14
13439	In Viola Turning Basin	Routine Metals in Water Organics in Water	4 2 2	Region 14

Segment 2485 – Oso Bay (Figure 7)
2004 Assessment
The segment remains listed as having an impairment for depressed DO. TMDL and 24-hour DO monitoring is continuing.

The 2002 assessment listed this segment as having a concern for bacteria, but there was not enough data to make a full assessment. Additional data now indicates that there is an impairment for bacteria.

Chlorophyll a remains listed as having a concern. Nutrients have been added to the list of concerns.

Trend Analysis
There are still increasing trends for DO Deficit and sulfate.

Wastewater Discharge Permittees
Central Power and Light Company (Barney M. Davis Plant) (to be closed)
Celanese Ltd (Hoechst Celanese Corp)
Texas A&M University System (La Coss Facility Corpus Christi)
City of Corpus Christi (Greenwood Plant and Oso Facility)
City of Robstown
Corpus Christi Peoples Baptist Church (Roloff Facility)
Tennessee Pipeline Construction (Cudahy Field)

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13440	At Padre Island Drive (SH 358)	Routine	4	NRA
13442	At Ocean Drive	Conventional Field 24-Hour DO	5 12 12	CCS TMDL
17118	Northeast of Padre Island Drive (SH 358) 100m From Northeast Corner Of Bridge in Corpus Christi			
17119	100m Northeast of Holly Road at RR Bridge in Corpus Christi			
17120	50m Northeast of Yorktown Bridge (CR 24) in Corpus Christi			

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Segment 2485A – Oso Creek (Figure 3)
2004 Assessment
The segment remains listed as having an impairment for bacteria. TMDL monitoring is continuing.

Nitrogen, orthophosphorus, and total phosphorus remain listed as concerns.

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13028	At SH 286 South of Corpus Christi	Routine	4	NRA

Segment 2491 – Laguna Madre (Figures 2, 3, and 7)
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having a potential impairment for depressed DO, but there was not enough data to make a full assessment. 24-hour DO monitoring is continuing in this segment under a TMDL to collect more information.

The 2002 assessment listed this segment as having concerns for bacteria in oyster waters, chlorophyll a, ammonia, nitrogen, orthophosphorus, and total phosphorus

Trend Analysis
There are no longer increasing trends for alkalinity, and TKN. Nine out of twenty increasing trends for salinity remain. One out of two increasing trends for TDS remain. One out of three increasing trends for temperature remain. Increasing trends remain for conductivity, DO Deficit, TOC, and sulfate.

Wastewater Discharge Permittees
Harlingen Shrimp Farms, LTD (Aquaculture Facility)
City of Santa Rosa
Loma Alta Trust (Loma Alta Aquaculture)
City of Raymondville
City of Edinburg
City of Weslaco
Port Mansfield Public Utility District (PUD)
City of McAllen
Jim Hogg County WCID NO. 2 (Hebbronville Plant)
City of Lyford
US Dept. of Justice (Port Isabel Detention Center)
Fig Tree R.V. Resort, L.C.
US Department of the Interior
Sebastian MUD
North Alamo WSC (La Sara)
City of Corpus Christi (Laguna Madre and Whitecap Plant)
Laguna Madre Water District (Isla Blanca Plant, Andy Bowie Park Plant and Laguna Vista Wastewater Treatment Plant (WWTP))

Fishing Cabin on Spoil Bank in Laguna Madre
(Photo courtesy of Center for Coastal Studies, Texas A&M University – Corpus Christi)

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13443	South of the Intersection of GIWW and Padre Island Causeway	Routine	4	Region 14
13444	At Intersection of GIWW at Baffin Bay Marker	Routine	4	Region 14
		Conventional Field 24-Hour 40	5 12 12	CCS TMDL
13445	At GIWW Near Bird Island	Routine	4	Region 14
		Conventional Field 24-Hour 40	5 12 12	CCS TMDL
13446	GIWW at Marker 129 East of Port Isabel	Routine	2	Region 14
		Conventional Field 24-Hour 40	5 12 12	CCS TMDL
13447	Intersection of GIWW and Arroyo Colorado	Routine	4	Region 15
		Conventional Field 24-Hour 40	5 12 12	CCS TMDL
13448	Intersection of GIWW and Port Mansfield Channel	Routine	2	Region 15
13449	Channel Marker C-225A North of Port Mansfield	Routine	4	Region 15
		Conventional Field 24-Hour 40	5 12 12	CCS TMDL
14870	200 yds. Off Laguna Vista Shoreline	Routine	2	Region 15
17121	0.7km Southeast of End of Yorktown Road Approximately 1.3km Northwest of Pita Island in Corpus Christi	Routine	2	Region 15
		Conventional Field 24-Hour 40	5 12 12	CCS TMDL

On the Water in Laguna Madre
(Photo courtesy of Center for Coastal Studies, Texas A&M University – Corpus Christi)

Segment 2492 – Baffin Bay / Alazan Bay / Cayo del Grullo / Laguna Salada (Figures 2 and 3)
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having a concern for chlorophyll a.

Trend Analysis
There are no longer increasing trends for TOC, chloride and sulfate. Increasing trends remain for DO Deficit.

Wastewater Discharge Permittees
Ticona Polymers, Inc. (Bishop Plant)
Texas Ecologists, Inc.
San Diego Municipal Utility District (San Diego Plant)
City of Bishop
City of Alice (Southside Plant and East Plant)
City of Kingsville (Plant 1 and Plant 2)
US Department of the Navy (Kingsville Naval Air Station)
Kleberg County (Kaufer Hubert Memorial Park)
Riviera WCID
County of Kleberg (Ricardo WWTP)

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13003	San Fernando Creek at US 77 Bypass Bridge at Kingsville	Routine	4	Region 14
13450	At Channel Marker 14			
13452	At Channel Marker 36	Routine Metals in Water	4 2	Region 14

****

Segment 2493 – South Bay
2002 Assessment (Not assessed in 2004)
No concerns or impairments.

Trend Analysis
There is no longer an increasing trend for alkalinity. One out of Three increasing trends for salinity remain. An increasing trend remains for conductivity.

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13459	Near Ship Channel Marker 17	Routine	2	Region 15
14865	Middle of Bay			

Segment 2494 – Brownsville Ship Channel (Figure 2)
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having a concern for depressed DO. 24-hour DO monitoring is will be conducted in this segment.

Trend Analysis
There are still increasing trends for conductivity, alkalinity, salinity, and TKN.

Wastewater Discharge Permittees
Brownsville Navigation District (Fishing Harbor Plant and Northside Plant)
Valley MUD No. 2
Laguna Madre Water District (Port Isabel Plant)
Brownsville Public Utilities (N. Robindale Plant)
City of Los Fresnos
John Frias (St. Francis of Assisi)
Olmito WSC (Olmito Plant)

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13285	Port Isabel Fishing Harbor at Hwy 100 Bridge	Routine Metals in Water	4 2	Region 15
		Metals in Sediment	2	Region 15 Special Study
13460	Near Ship Channel Marker 35 (Black Buoy)	Routine Metals in Water	4 2	Region 15
		Metals in Sediment	2	Region 15 Special Study

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Segment 2501 – Gulf of Mexico (Figures 2 and 3)
2002 Assessment (Not assessed in 2004)
The 2002 assessment listed this segment as having a concern for mercury in king mackerel > 43 inches

FY 2004 Monitoring

Station	Description	Type	# Samples	Entity
13468	At Port Aransas Near End of South Jetty Near Marker R-7	Routine	4	Region 14
13470	At Port Isabel, Just Beyond Jetties at Bell Buoy	Routine	2	Region 15

SPECIAL STUDIES

Nueces River Tidal Special Study

NRA completed its Nueces River Tidal Special Study in October 2003. The purpose of the study was to provide routine hydrological, flow, and bathymetric data to monitor the effects of high and low flow conditions on the Nueces Tidal Segment (segment 2101). The segment is approximately 11 miles long and flows from the Calallen Saltwater Barrier Dam located just upstream of IH 37 to its confluence with Nueces Bay.

Four stations were monitored approximately once a month from August 2002 to August 2003. (December 2002 and July 2003 were not monitored due to high flow conditions >3000 cfs.) Two of the stations were located upstream near IH 37 and the other two where located downstream closer to the confluence with Nueces Bay. Surface waters were monitored for temperature, dissolved oxygen, pH, specific conductance, and salinity. Data collection was taken as a vertical profile: one foot below the surface, at five foot intervals below the surface to a depth of one foot above the bottom. In addition, field data collected included transparency, air temperature, wind speed and wind direction.

Streamflow measurements were made during periods of sufficient flow at the two upstream stations where the data could be compared to a US Geological Survey flow gauge. The two downstream stations were tidally influenced to the extent that reliable flow data could not be obtained.

Bathymetric profiles were made at approximately 0.5 mile increments from the Saltwater Barrier Dam downstream to the mouth.

Tidal data was obtained using the Texas Coastal Ocean Observing Network tide gauge network operated by CBI. Tidal data was measured at the White Point gauge located near the mouth of Rincon Bayou in Nueces Bay.

During the study period, the Lake Corpus Christi / Choke Canyon Reservoir System (Reservoir System) experienced significant inflows resulting in two widespread flooding events in September and November 2002. A third event with minor flooding occurred in July 2003. Consequently, segment 2101 was at or above flood stage for a total of 58 inconsecutive days. In addition, due to the Reservoir System being at full capacity for much of the study period, spills dominated the flow regime as opposed to monthly pass-throughs to meet estuary inflow requirements.

Routine field data gathered during the study period included both periods of intermediate flow and low to no flow conditions. Data gathered during intermediate flow conditions was generally consistent with upland, riverine systems. Salinity values were low with homogenous vertical profiles at each site. DO values reflected nearly complete saturation throughout the vertical profile. However, as stream flow rates decreased, vertical stratification became apparent for all parameters. During periods of no flow, vertical profiles were highly stratified with respect to salinity and dissolved oxygen.

The full report can be found on NRA's website at http://www.nueces-ra.org/CP/CRP/reports/pdfs/ntss.pdf.

Cameron County NPS Monitoring Project

In Cameron County, a significant water pollution problem caused by non-point source (NPS) pollution has been attributed to runoff from the Green Valley Farms colonia and surrounding agricultural areas. Green Valley Farms is a largely undeveloped 2,000 acre colonia served by septic tank/soil absorption systems. During periods of wet weather, when soils become saturated, septic systems fail to function properly. Storm waters, in the form of sheet flow, pick up contamination from the colonia and surrounding agricultural areas and transport it downstream. During moderate flooding events, contaminated waters flow into a man-made ditch that flows into the upper portion of the Arroyo Colorado Tidal Segment (segment 2201), which then flows into the Laguna Madre. During large flooding events, a portion of the water diverts to the Resaca De

Los Fresnos which flows into the Laguna Atascosa in the Laguna Atascosa National Wildlife Refuge. The Arroyo Colorado tidal segment is included in the 2002 draft 305(B) Water Quality Inventory as having depressed dissolved oxygen.

The purpose of this study will be to collect data that will contribute to characterizing the water quality of NPS runoff from the colonia and surrounding agricultural areas prior to the construction of a proposed retention facility and wetland treatment system. The data will be compared at a later date to post-construction data to determine the effectiveness of the wetland system.

NRA will collect field parameters, conventional parameters, bacteria, and flow data monthly at one station from January 2004 through August 2005. Additionally, NRA will attempt to collect field and conventional parameters at four different high flow events during the study period. Five samples have been collected to date, one being a high flow event.

Drainage Ditch in Cameron County During High Flow Event

GIS Project for City

The City of Corpus Christi has contracted with NRA to create a GIS coverage of points of interest within one mile either side of the Nueces River from Lake Corpus Christi to the saltwater barrier dam (segment 2102). These points of interest are anything that could impact water quality along the river, given that the City's drinking water supply is drawn from the Nueces River just above the saltwater barrier dam. Aerial imagery is being analyzed to identify these points of interest, which will be ground truthed, if needed. The project will be completed by July 2004.

STAKEHOLDER PARTICIPATION

NRA depends on public involvement and input from stakeholders to assist in understanding the needs of the basins and the areas of concern. The 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, review and approval 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 and 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 the following groups:

- 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: Texas Parks and Wildlife Department, Texas Water Development Board, Texas General Land Office, TDH, Texas Department of Agriculture, Texas Railroad Commission, and Texas Department of Transportation.
- Other entities interested in water quality matters including: TCEQ regional staff, business and industry, agriculture, environmental and other public interest groups.

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_inv.html, or contact NRA using the contact information on page 30 of this report.

PUBLIC OUTREACH

In 2003, NRA participated in numerous activities to help educate students on pollution sources, the importance of keeping our waters clean, and what they can to do help protect our rivers, lakes, and bays.

NRA helped to coordinate and/or participated in:

- Nature Quest: Water Quality and River Ecosystems of the Upper Nueces River Basin in Concan
- Earth Day in the Upper Nueces River Basin
- Ft. Inge Days on the Leona River in Uvalde County
- Ecology Field Trips for Southwest Texas Junior College in Uvalde
- Gulf of Mexico Foundation Watershed Education Program
- Nueces River Cleanup and Rendezvous in Real, Uvalde, and Zavala Counties
- Nueces County Agricultural Fair in Robstown
- Nueces River Days

NRA provided guidance and support for field education activities for:

- Christian Faith Academy in Dilley
- George West ISD Elementary Schools
- St. Phillips Elementary in Uvalde
- Nueces Canyon ISD in Camp Wood
- Sacred Heart School in Uvalde
- Flores Elementary and Middle Schools in Uvalde
- Uvalde Consolidated ISD

NRA coordinating distribution of "How We Keep Our Waters Clean" activity to area elementary schools with:

- South Texas Water Authority in Kingsville
- Real Edwards Water Conservation and Reclamation District
- Uvalde County Groundwater Conservation District
- Live Oak County Groundwater Conservation District

NRA also:

- Presented Water Quality/Local Water Supply Presentation to Texas Prefreshman Engineering Program at Del Mar College in Corpus Christi
- Assisted at National Oceanic Science Bowl in Corpus Christi

NRA uses the Texas Watch NPS model to demonstrate the effects of runoff on water quality in rivers and streams in a generic urban setting. NRA is working with the Coastal Bend Bays and Estuary Program and Texas State Aquarium to obtain a scale model of the Nueces River Basin that could be used for more realistic demonstrations.

Texas Watch is a network of trained volunteers and supportive partners working together to gather information about the natural resources of Texas and to ensure the information is available to all Texans. Volunteers are trained to collect quality-assured information that can be used to make environmentally sound decisions. Established in 1991, Texas Watch is administered through a cooperative partnership between Southwest Texas State University, TCEQ, and EPA. Currently, over 400 Texas Watch volunteers collect water quality data on lakes, rivers, streams, wetlands, bays, bayous, and estuaries in Texas. More information on Texas Watch is available at http://www.texaswatch.geo.swt.edu/.

NRA looks forward to continuing with its public outreach activities and welcomes requests from schools and community organizations for help with their educational programs. Contact NRA using the contact information on page 30 of this report if we can be of assistance to you.

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
- Water Quality Database
- Meeting Notices
- Monitoring Schedules
- Maps of Monitoring Sites
- QAPPs
- Steering Committee Information
- Public Outreach
- Reports

The CRP water quality database maintained by NRA contains water quality information about all the SWQM stations with 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 storet code.

CONTACT INFORMATION

For additional information, questions, or comments, contact:

Nueces River Authority – Coastal Bend Division
6300 Ocean Drive, NRC Ste. 3100
Corpus Christi, Texas 78412
Tel: 361-825-3193
Fax: 361-825-3195
Or
Nueces River Authority – General Office
P.O. Box 249
Uvalde, Texas 78802-0349
Tel: 830-278-6810
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Appendices

Appendix 1. Sampling Parameters

Monitoring Type	Parameters	
Conventional	Total Suspended Solids	Pheophytin
	Volatile Suspended Solids	Ammonia
	Total Dissolved Solids	Hardness[2]
	Alkalinity	Nitrate+Nitrite
	Sulfate	Total Organic Carbon
	Chloride	Total Phosphorus
	Chlorophyll-a	Turbidity
	Biologic Oxygen Demand[1]	Orthphosphate[1]
	Total Kjeldahl Nitrogen[1]	
Bacteria	E. coli[2]	Enterococcus[3]
Field	pH	Wind direction
	Dissolved Oxygen	Wind intensity
	Conductivity	Present Weather
	Salinity[3]	Water Color
	Temperature	Water Odor
	Secchi Depth	Water Surface
	Days since last rainfall	Turbidity
	Flow[4]	Tide Stage[3]
	Flow measurement method[4]	Rainfall 1 day prior
	Flow severity[4]	Rainfall 7 days prior
	Air temperature	
Organics in Water	1,1,1-Trichloroethane	Chloroform
	1,1,2,2-Tetrachloroethane	Chloromethane
	1,1,2-Trichloroethane	cis-1,3-Dichloropropene
	1,1-Dichloroethane	Dibromochloromethane
	1,1-Dichloroethylene	Ethylbenzene
	1,2- Dichloroethane	Methyl tert-butyl ether
	1,2-Dichloropropane	Methylene chloride
	Benzene	Tetrachloroethylene
	Bromodichloromethane	Toluene
	Bromoform	trans-1,2-Dichloroethene
	Bromomethane	trans-1,3-Dichloropropene
	Carbon Tetrachloride	Trichloroethene
	Chlorobenzene	Vinyl chloride
	Chloroethane	
Metals in Water (All Dissolved)	Aluminum	Manganese
	Arsenic	Nickel
	Chromium	Selenium
	Copper	Silver
	Lead	Zinc
Metals in Sediment	Aluminum	Manganese
	Arsenic	Mercury
	Cadmium	Nickel
	Chromium	Selenium
	Copper	Silver
	Lead	Zinc

[1] Measured only at station 18196 for Special Study
[2] Measured only at fresh water stations
[3] Measured only at marine and tidal stations
[4] Measured only at non-tidal stream stations

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 is 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, Selinium, 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

Turbidity - measures the clarity or cloudiness 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 Kjeldahl Nitrogen – measures the organically bound nitrogen and free ammonia 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

Volatile Organic Compounds - the collective name for a multitude of carbon-based compounds that evaporate readily into the atmosphere which can be health hazard if inhaled: examples include benzene, methyl tert butyl ether (MTBE), vinyl chloride, chloroform, formaldehyde, and toluene

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