

BASIN HIGHLIGHTS REPORT 2000 LAVACA RIVER BASIN

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LAVACA - NAVIDAD RIVER BASINS



BASIN HIGHLIGHTS REPORT For the LAVACA RIVER BASIN

Texas Clean Rivers Program Lavaca-Navidad River Authority June, 2000

LAVACA BASIN OVERVIEW

The Lavaca River Basin has 188 stream miles and a drainage area of 2,309 square miles encompassing portions of six counties: Fayette, Colorado, Wharton, Jackson, Lavaca and DeWitt. Population of the Basin was 41,751 in 1990 and has been projected to reach 63,289 by the year 2040. Major population centers located within the Basin are Schulenburg, Edna, Ganado, Hallettsville, Moulton, Shiner, and Yoakum.

The Lavaca River Basin is bounded on the north and east by the Colorado River Basin, on the west by the Guadalupe River Basin, on the southeast by the Colorado-Lavaca Coastal Basin, and on the southwest by the Lavaca-Guadalupe Coastal Basin. About 40 percent of the Basin is drained by the Lavaca River watershed while the remaining area is drained by the Navidad River watershed including the principal tributaries of Sandy and Mustang Creeks.

Headwaters of the Navidad River rise in the East and West Forks at an elevation of 440 feet in southern Fayette County. These forks join near Oakland at an elevation of 201 feet and flow southward to Lake Texana. Lake Texana has an authorized diversion of 74,500 acre-feet/year and was constructed by the U.S. Bureau of Reclamation for municipal, industrial, fish and wildlife, and recreational benefits.



The Lavaca River originates at an elevation of 470 feet and flows southeast from southern Fayette County into Lavaca Bay. The confluence of the Lavaca and Navidad Rivers is about two miles east of Vanderbilt in Jackson County. The Lavaca River Basin is part of the West Gulf Coast Section of the Coastal Plain Physiographic Province and includes the Blackland Prairie, Claypan, and Coastal Prairie land-resource areas.

In the upper part of the Basin, the Blackland Prairie is a level to rolling, well-dissected grassland with rapid drainage. The Claypan area is a gently rolling moderately-dissected post oak savanna with moderate surface drainage. In the lower Basin, the Coastal Prairie is a nearly level, practically undissected plain with slow surface drainage.

The upper Lavaca Basin is underlain by gray clay of the Fleming Formation of Tertiary age which dips gently toward the Gulf of Mexico. Overlying the Fleming Formation are gravel, sand, silt, and clay of the Willis, Lissie, and Beaumont Formations each of which are Pleistocene age formations. Recent alluvium occurs along streams.

The Lavaca River Basin lies within the warm temperate zone and is classified as humid, subtropical with hot summers. Because of the proximity of the Basin to the Gulf of Mexico and the prevailing southeasterly wind, a marine climate exists throughout spring, summer, fall, and much of the winter season. Summers are hot and humid with little variation in day-to-day weather conditions, except for occasional thunderstorms. Winters are short



and mild, moderated by polar air masses which frequently push southward and bring weather to the Basin that alternates from cool, overcast, and drizzly to mild, sunny, and dry conditions. During late summer and early fall the occurrence of tropical disturbances moving in the easterly trade winds often bring heavy rains. The mean annual precipitation in the Basin varies from 34 inches along the western boundary to approximately 41 inches along the eastern boundary. Average annual rainfall runoff ranges from 200 acre-feet (one acre-foot equals 325,828 gallons) per square mile in the western part of the Basin to 335 acre-feet in the east.

Average annual net lake surface evaporation rates range from ~20 inches along the eastern river basin boundary to ~28 inches along the western border. Relative humidity is usually higher during winter and spring than in summer and fall. Mean monthly relative humidity measured at noon is 63 percent in January and April and 54 percent in July and October.

For water quality management purposes the Basin has been divided into five stream segments:

Segment 1601 is the tidal portion of the Lavaca River from the mouth of the Lavaca River to the confluence of the Lavaca and Navidad Rivers. Several small tributaries, the Menefee Lakes, Redfish Lake, Swan Lake, Redfish Bayou, and Catfish Bayou are included in this segment. This entire area is important as nursery grounds for marine organisms and as habitat and feeding grounds for birds, fish, reptiles and amphibians.

Segment 1602 is the upper Lavaca River above tidal portion. The predominant land use in the watershed is agricultural, with some forested land. Wastewater effluents from the cities of Edna, Yoakum, Shiner, Moulton and Hallettsville enter either directly into the Lavaca or into tributaries leading to the Lavaca River. Recent improvements and upgrades to Wastewater Treatment Plants (WWTP's) serving these communities should improve water quality in this segment.

Segment 1603 is the Navidad River from the confluence of the Lavaca and Navidad Rivers up to the Lake Texana spillway. The east and west drains along the east and west dikes of Lake Texana drain water into this segment. The east drain has continuous flow year-round due mainly to seepage from shallow groundwater sources. The west drain has intermittent flow resulting from agricultural land drainage. Water releases from Lake Texana flow through this segment to the Lavaca River and then into Lavaca Bay.



Segment 1604 is Lake Texana, a 10,134 acres reservoir with a capacity of 163,506 acre feet. Sandy Creek, Mustang Creek and the Navidad River drain into the lake. Wastewater effluent from the communities of Ganado and Louise enter this segment via branches of Mustang Creek.

Segment 1605 is the Navidad River beginning above the backwaters of Lake Texana and extending up to its origin in Lavaca County. Many tributaries drain into this segment, and the wastewater effluent from Schulenburg enters this segment via an unnamed tributary. Land use is almost completely agricultural and some post oak savanna.

The appendix includes a map, Factors Influencing Water Quality, which shows the wastewater treatment plants, population centers, and the stream segments.

INTRODUCTION OF CLEAN RIVERS PROGRAM (CRP) IN LAVACA BASIN

In 1991 the Texas Legislature passed Senate Bill 818, The Texas Clean Rivers Act, which requires that water quality be assessed in a holistic manner via a basin or watershed management approach. The Clean Rivers Program (CRP) developed as partnerships among Texas Natural Resource Conservation Commission (TNRCC), other state agencies, river authorities, local governments, industry, and citizens. To fund the program the TNRCC assesses a fee on permit holders of water rights and wastewater discharge permits. The Authority's municipal and industrial water customers, as assurance of a clean and reliable water supply, fully support the Authority's water quality initiative. These customers supplement state collected and appropriated fees to ensure adequate program funding.



Lavaca River (Segment 1601)

The Clean Rivers Program and the Lavaca Basin Steering Committee have cooperated with the Lavaca-Navidad River Authority (LNRA) to identify and evaluate priority issues in the areas of water quality monitoring, water conservation, drought management planning, water quality data management, and efforts to increase public awareness and involvement. These efforts have combined to enhance, protect, and preserve the excellent water resources of the Lavaca Basin.

WATER QUALITY IN THE LAVACA BASIN

Due to low density of the human population and investments in wastewater treatment by the municipal and industrial sectors and the Soil and Water Conservation Districts non point source programs, the water resources of the Lavaca Basin remain in a relatively high state of water quality. LNRA places high priority on watershed protection to preserve the integrity of the Lavaca Basin water resources for municipal, industrial, agricultural, recreational, and fish and wildlife purposes. In an effort to ensure public involvement in the water quality planning and evaluation processes, LNRA works with a CRP Steering Committee to set priorities for the water quality assessment of the Basin. Membership of the Committee is open to diverse representation from state and local government, private landowners, representatives of industry and agriculture, and concerned citizens. Interested parties willing to commit to at least one (1) meeting per year are encouraged to join by calling LNRA General Manager, Jack C. Nelson or Water Resources Manager, Patrick Brzozowski at 361-782-5229.

A copy of this report will be made available to current CRP Steering Committee Members including:

George Ozuna
USGS

Buddy Miller
USGS

Stephanie Marr
USGS

Allison Woodall
TNRCC

Scott Kinderwater
TNRCC

Rene Mariscal
TNRCC

Steve Smith
TNRCC

Don Ottmers
TNRCC

Adrienne Boer
TNRCC

Linda Brookins
TNRCC

Steve Marwitz and Bob Wallace
Formosa Plastics Corp.
Point Comfort, TX

Paul Morkovsky
Kaspar Wire Works
Shiner, TX

Michael Slobojan
City of Moulton, TX

Mayor Arthur T. Ward
Shiner, TX

Ronald Brossmann
City of Schulenburg Administrato

Mayor Joe Hermes and City Manager Gerald Decker
Edna, TX

Mayor Fred Rickaway
Ganado, TX

Irvin Kolacny
Director of Public Works of Hallettsville, TX

Mayor Pam Lambden
Point Comfort, TX

Judge Harrison Stafford, II
Jackson County

Judge Charles J. Rother
Lavaca County

Judge Lawrence Naiser
Wharton County

Dennis S. Simons, Chairman
Jackson County Navigation District

John Findeisen
Texas Parks and Wildlife

John D. Henneke, President
Lavaca County Flood Control

Commissioner Philip Miller
Wharton County Precinct #3

John Mayfield, Environmental Manager
Alcoa, Point Comfort, TX

Ken Barton, Texas Watch and science teacher
Edna, TX

J. Aubrey Hollis, President of Board of Directors
Jackson County WCID #1

Robert B. Coen
Inteplast Corporation, Lolita, TX

Robert Shoemate
Jackson County Soil & Water Conservation District

Spoetzle Brewery
Shiner, TX

Mayor M.W. Harbus, Jr. and Dwight Burns
City of Yoakum, TX

Water District of Vanderbilt, TX

Water District of Louise, TX

Water District of Lolita, TX

Diane Arnold and Abel Bermudez
Jackson County NRCS

Marvin Lesiker
Jackson County Agricultural Extension Service

Noah Kline
Texas Department of Agriculture

WATER QUALITY PROGRAM GOALS

The Authority's water quality program is focused on promoting the following goals:

Watershed Protection. The Lavaca Basin watershed protection program will be accomplished through the LNRA stream and reservoir water quality monitoring program, the Texas Natural Resource Conservation Commission (TNRCC) inspection and enforcement program, and support by local governmental entities..

Development of an economically feasible and environmentally sound water quality management strategy for the protection of fresh water and estuarine resources. The LNRA Quality Assurance Project Plan (QAPP) developed for the CRP provides the guidance necessary to ensure the water quality integrity of the Lavaca Basin.



The Clean Rivers Program will result in direct benefits for the fee payers and citizens of the Basin. The data base created under the Water Quality Monitoring Program, Receiving Water Assessment and public involvement will provide the information necessary to make informed management decisions that will enhance the water quality conditions in the Basin.

WATER QUALITY LONG-TERM PLANNING

LNRA has an approved Texas State Soil and Water Conservation Board Water Quality Management Plan for Lake Texana Project Lands and a Water and Land Management Plan for Lake Texana that has been approved by the TNRCC. These plans will be utilized by the Lavaca Regional Water Planning Group to develop their regional water plan.



LNRA has contracted for the entire 74,500 acre-feet of permitted diversions from Lake Texana for municipal and industrial purposes. Therefore, watershed protection is a top priority for LNRA, the water supply and recreation users in the Basin, and the City of Corpus Christi and their 10 county service area. CRP provides a vehicle to address the effects of both point and non-point pollutant sources, and facilitates informed decisions on permits and other management practices that protect the state's surface water resources.

LNRA will continue to provide a scientific foundation for water resources planning initiatives through its data collection and analysis efforts under the CRP. Water quality monitoring will allow the Authority to identify areas of concern and to recognize trends in water quality. The Authority will also continue efforts to promote water conservation through implementation of the Lavaca Basin Water Conservation and Drought Management Plan, and through assistance to customers in the development of their plans for water conservation.

WASTEWATER TREATMENT IMPROVEMENTS IN THE LAVACA BASIN

Improvements and upgrades implemented in recent years in Lavaca Basin include:

- Hallettsville upgraded their wastewater treatment plant in late 1980's
- Kaspar Wire Works in Shiner implemented an electro-coagulation pre-treatment for their waste stream in 1995
- Ganado built a wastewater treatment plant with extended aeration in 1995
- Schulenburg upgraded their Kallus St. wastewater treatment plant with 2 oxidation ditches, clarifiers & chlorine content equipment in 1995
- Edna upgraded wastewater treatment plant in 1995
- Yoakum built a new wastewater treatment plant at a higher elevation above the creek than the previous plant in April, 1998
- Shiner upgraded their wastewater treatment plant May, 1998

PUBLIC OUTREACH AND TEXAS WATCH

The LNRA public outreach efforts include education and assistance in water conservation and drought contingency planning, news releases, public meetings, attendance at water quality issues meetings, providing Major Rivers Program to county elementary schools, and support of the Texas Watch Program. The TNRCC created the Texas Watch Program to “facilitate environmental stewardship by empowering a statewide network of concerned volunteers, partners, and institutions in a collaborative effort to promote a healthy and safe environment through environmental education, data collection, and community action.” In addition Texas Watch creates an extended database of water quality for the state of Texas.

The Texas Watch Program has recently moved to Southwest Texas University (SWT) in San Marcos where it is administered through a cooperative partnership of SWT, TNRCC, and the Environmental Protection Agency (EPA). The program is very active in educating the public on water quality standards and issues as well as training volunteers in proper water quality data collection techniques. The website for Texas Watch is www.texaswatch.geo.swt.edu and their toll-free number is 877-506-1401. LNRA provides support to a local junior high science teacher, Ken Barton, in his ongoing volunteer and educational work with Texas Watch. Each month he and his students monitor a section of Lake Texana. LNRA provides rain data, forms and equipment to these Texas Watch volunteers.

COORDINATED MONITORING

LNRA held its Coordinated Monitoring Meeting on April 27, 2000, at the Harry Hafernick Center in Brackenridge Park. In attendance were personnel from LNRA,



TNRCC, USGS, Formosa Plastics, and Kaspar Wire Works. Several issues were discussed including elimination of a redundant sampling site (#15368) from Lavaca Bay and the moving of sites #15377 and 15376 slightly in order to glean more pertinent data in these areas. David Hill of Formosa reported that his company does extensive testing in Lavaca Bay including fish tissue samples. Future proposed

stream gauge and sampling and monitoring sites on upper Lavaca River were discussed along with other issues.

WATER QUALITY MONITORING AND DATA

LNRA collects information on both factors (permanent or long-term influences, e.g. discharge permits) and events (one-time occurrences, e.g. spills) having the potential to impact water quality in the basin. LNRA maintains this information electronically and in a GIS database. Twice yearly an Inventory of Events is submitted to the Clean Rivers Program Project Manager, and LNRA can make this information available to interested parties upon request. This information is used to develop a growing database of water quality information for both Lavaca basin and the state of Texas.

LNRA collects monthly field data at 20 sites. Field monitoring parameters include:

- pH
- Temperature
- Specific conductance
- Salinity
- Dissolved oxygen
- Secchi disk transparency (turbidity).

LNRA also samples for quarterly conventional parameters at 14 sites in the basin. Conventional parameters tested by LNRA include:

- Total alkalinity
- Chloride
- Ammonia
- Total Organic Carbon
- Dissolved orthophosphorus
- Turbidity
- Total hardness
- Sulfate
- Nitrate+nitrite
- Total Suspended Solids
- Total phosphorus

Stream flow data is also included for the non-tidal segments. In Segment 1601 monthly field monitoring occurs at 5 sites and quarterly conventional sampling at 1 site. In Segment 1602 monthly field monitoring and quarterly conventional occur at 2 sites along with twice a year testing for bacteria. There are 3 additional sites proposed that will include sampling for field and conventional parameters in this segment. In Segment 1603 monthly field monitoring occurs at 3 sites and quarterly conventional sampling at 1 site. In Segment 1604 (Lake Texana) both monthly field monitoring and quarterly conventional sampling are conducted at 9 sites. In Segment 1605 there is one sampling site used for monthly field monitoring and quarterly conventional sampling.

In addition to the above the USGS tests in Segments 1604 and 1605 for metals and organics in the water and sediments. Presence of certain organics can indicate residues from pesticides or herbicides.

The appendix includes a map of Water Sampling Sites and a table showing monitoring and sampling site numbers, locations, parameters and frequency in each stream segment.



SCREENING ANALYSIS RESULTS AND RECOMMENDATIONS

Lavaca River Basin Screening Results – Toxics in Water

- Time Period: January 1, 1995 – July 31, 1999
- 0 Exceedences – Parameters included: arsenic, cadmium, chromium, copper, lead, nickel, silver, and zinc.

Lavaca River Basin Screening Results – Human Health Criteria

- Time Period: January 1, 1995 – July 31, 1999
- 0 Exceedences

Lavaca River Basin Screening Results – Standards and Nutrients

- Time Period: January 1, 1995 – July 31, 1999

Segment 1602 is the Lavaca River above the tidal portion. Many tributaries drain into the Lavaca River, Dry Creek drains wastewater effluent from Edna, Rocky Creek drains wastewater effluent from Shiner, and the Big Brushy and Clarks Creeks drain wastewater effluent from Yoakum. Hallettsville and Moulton dispose of wastewater effluent into the main stem of the Lavaca River. Data collected from sampling conducted during the period September 1, 1992 through August 31, 1996 present fecal coliform, ortho, total phosphorus and oil field waste as problems associated with this segment. Implementation of advanced waste treatment for point source wastewater discharges are complete.

Site Description	TNRCC Station #	Parameter	#Exceedences/ #Samples	% Exceedences
Lavaca River @ Hallettsville	12526	Temperature TSS	6/14 3/15	42 20

According to the data collected, the Upper Lavaca River segment near Hallettsville has consistently had a seasonal increase in summer water temperatures. Water temperature begins to rise in mid-May and relatively high temperatures are sustained throughout the summer. Limited canopy cover and reduced flow during the summer months in the Upper Lavaca River significantly affect the thermodynamics of the area. Considering that the rise in temperature is a natural occurrence there is relatively little that can be done to limit the increase. As reported in previous documents, total suspended solids have been a concern in the area, but high levels of TSS coincide with precipitation events and storm water runoff. It is reasonable to expect periodic increases in TSS concentrations

considering that the area is susceptible to severe streambed and bank erosion from storm events and runoff.

Segment 1604 is from the Lake Texana spillway to the backwaters of the reservoir. Drainage areas feeding this segment include Sandy Creek, Mustang Creek, the Navidad River, and numerous unnamed drains and tributaries. Sandy Creek is an intermittent waterway draining a large portion of the Basin through Jackson, Wharton, Lavaca and Colorado Counties. A majority of the flow originates from return flow of irrigation water from rice fields. Mustang Creek branches off to the East, West and Middle Mustang and drains a portion of the Basin from the Garwood Irrigation Service Area to Lake Texana. Wastewater effluent from Ganado drains directly into Lake Texana, and the wastewater effluent from the Sheridan community drains into Sandy Creek

Site Description	TNRCC Station #	Parameter	#Exceedences/ #Samples	% Exceedences
W. Mustang Creek @ Hwy 59	13655	Chloride	8/19	42
		TSS	10/28	36
E. Mustang Creek @ FM 647	15382	Chloride	4/13	31
		Sulfate	5/13	38
		TSS	3/12	25
Lake Texana E. of Spillway	15377	Nitrate + Nitrite	6/18	33
		Ortho P	8/16	50
Lake Texana Upstream of Dam	15381	Nitrate + Nitrite	5/18	28
		Ortho P	9/17	53
Lake Texana S. of S. Hwy 111	15379	Nitrate + Nitrite	7/19	37
		Ortho P	10/19	53
Lake Texana N. of S. Hwy 111	13984	Nitrate + Nitrite	6/18	33
		Ortho P	7/18	39
Lake Texana Mustang Creek Arm	13986	Nitrate + Nitrite	8/19	42
		Ortho P	4/10	40
		T. Phosphorous	10/19	53
Lake Texana S. of Hwy 59	13985	Nitrate + Nitrite	6/19	31
		Ortho P	8/19	42

Many of the monitoring sites within the 1604 segment of the Lavaca Basin have been flagged for high concentrations of nutrients. Sites 13655 and 15382 have been flagged for major cations and anions that contribute to salinity.

The data collected from site 13655 (West Mustang Creek at Highway 59) and site 15382 (East Mustang Creek at FM 647) show periodic elevated levels of chloride and sulfate, with site 15382 having occasional reductions in dissolved oxygen concentration and increases in total suspended solids. The salinity of water is variable. Naturally occurring geologic formations in the basin, balances between evaporation, precipitation and inflow, and contributions from oil and gas exploration and production and return flows from agriculture upstream of this segment may

have an effect on the chloride levels found at these sites. Considering that these stream segments are subject to fluctuations in flow and are susceptible to the introduction of chlorides from the agriculture and oil and gas industry, it is not unusual to see fluctuations in concentrations within individual streams.

Storm events and runoff cause a substantial increase in flow and would markedly enhance the probability of erosion, which would explain the elevated levels of total suspended solids (TSS) seen periodically in the area.

Site 15377 (Lake Texana East of Spillway), 15381 (Lake Texana upstream of dam), 15379 (Lake Texana South of South Highway 111), 13984 (Lake Texana North of South Highway 111), 13986 (Lake Texana Mustang Creek Arm), and 13985 (Lake Texana South of Highway 59) have been cited for elevated levels of nitrate/nitrite and orthophosphate. Concentrations of nitrate, nitrite and phosphorous (or its hydrolyzed, soluble form, orthophosphate) appear to be seasonal within Lake Texana, usually coinciding with periods of crop fertilization and increased precipitation. Hay production in the area may also contribute to the periodic elevated concentrations of nitrates and nitrites in the region.

Recommendations:

The screening analysis indicates that elevated nutrient levels (including orthophosphorous, nitrates, and nitrites) exist in segment 1604. Possible sources of nutrients are as stated previously in the segment analysis. Of these sources, the agricultural sector plays a dominant role in nutrient supply to the basin. Runoff from row crop production, rangeland management operations, and return flows from irrigated agricultural acreage increase the influx of nutrients to streams and tributaries supplying this segment. The Authority has recognized this in its own operations and has instituted the placement of indigenous vegetative buffer zones on all land adjacent to water bodies under its management. It is commonly known that properly placed and managed buffer zones aid in the removal and/or reduction of nutrient concentrations in runoff. Implementation of environmentally sound, strategically placed buffer zones should alleviate some of the environmental stresses caused by nutrient loading.

Lake Texana and the streams and tributaries that contribute to it have periodically elevated levels of total suspended solids. This is primarily a naturally occurring aspect of the watershed. High volumes of colloidal materials from agricultural runoff and stream bed erosion during flood events, coupled with a relatively shallow reservoir that is subjected to strong wave action due to fetch distance, keep this material in suspension leading to elevated readings.

RIVER AUTHORITY UPDATES

Current Lavaca-Navidad River Authority Board of Directors:

- Mitzi M. Mauritz, President
- Robert C. Martin, Vice-President
- Willard E. Ulbricht, Secretary/Treasurer
- Gerald M. Boyd, DVM
- Mark Cayce
- Michael W. Menefee
- Robert Michael (Mike) Myers
- Sharla Vee Strauss
- Charles M. Hasdorff

LNRA Management:

- | | |
|----------------------|---------------------------|
| • Jack C. Nelson | General Manager |
| • Denise Ryan | Assistant General Manager |
| • Charles Reckaway | Deputy General Manager |
| • Patrick Brzozowski | Manager Water Resources |

Water Quality Staff:

LNRA hired two water quality specialists for the environmental section in early 2000:

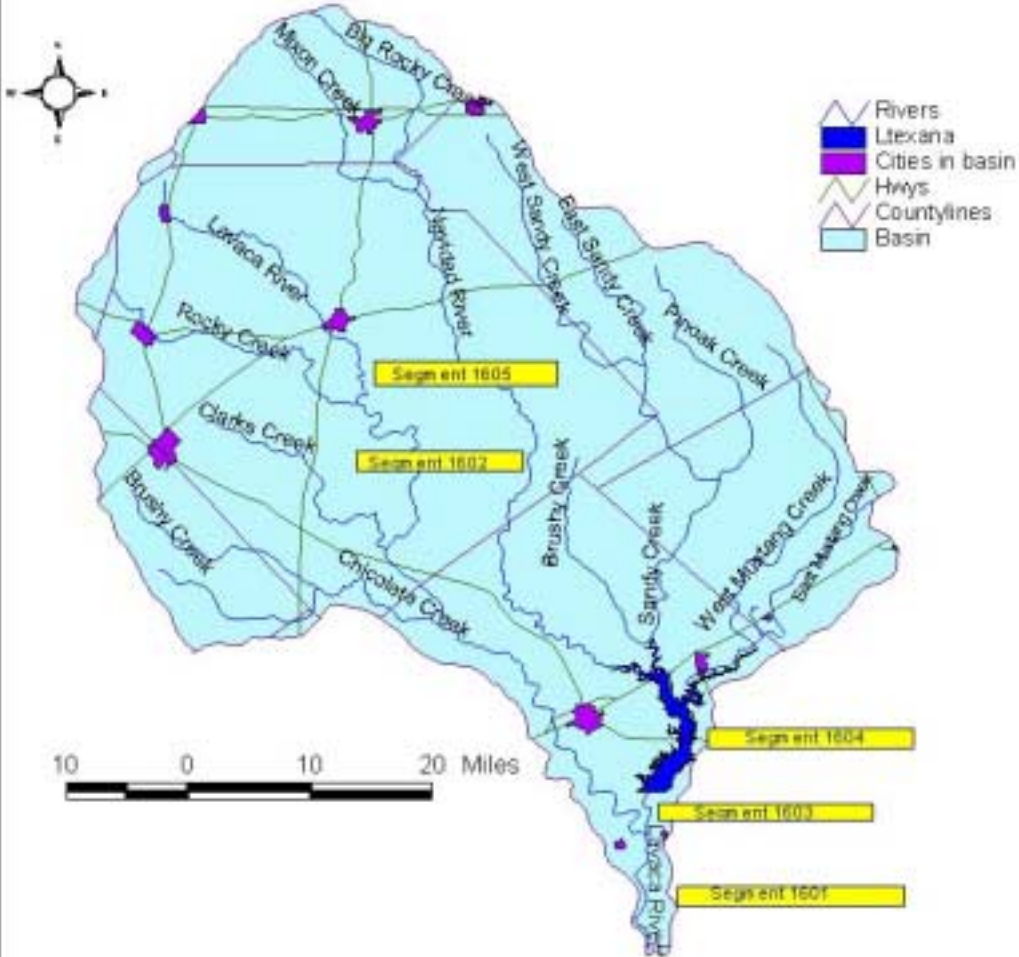
Matthew Dondee (mdondee@lnra.org) and Sylvia Balentine (sbalentine@lnra.org). Dondee holds a BS from New Mexico State University and is a microbiologist specializing in bacterial pathogenesis. Dondee collects and analyzes field data, maintains water quality database, and investigates water quality incidents in the basin. Balentine holds a MS from Texas A&M Corpus Christi where she taught in the Environmental Science department. Balentine works with CRP reporting and the GIS database.

For additional information, questions, or comments visit LNRA's web site at www.lnra.org, or contact Patrick Brzozowski (pbrzozowski@lnra.org), Manager of Water Resources, at

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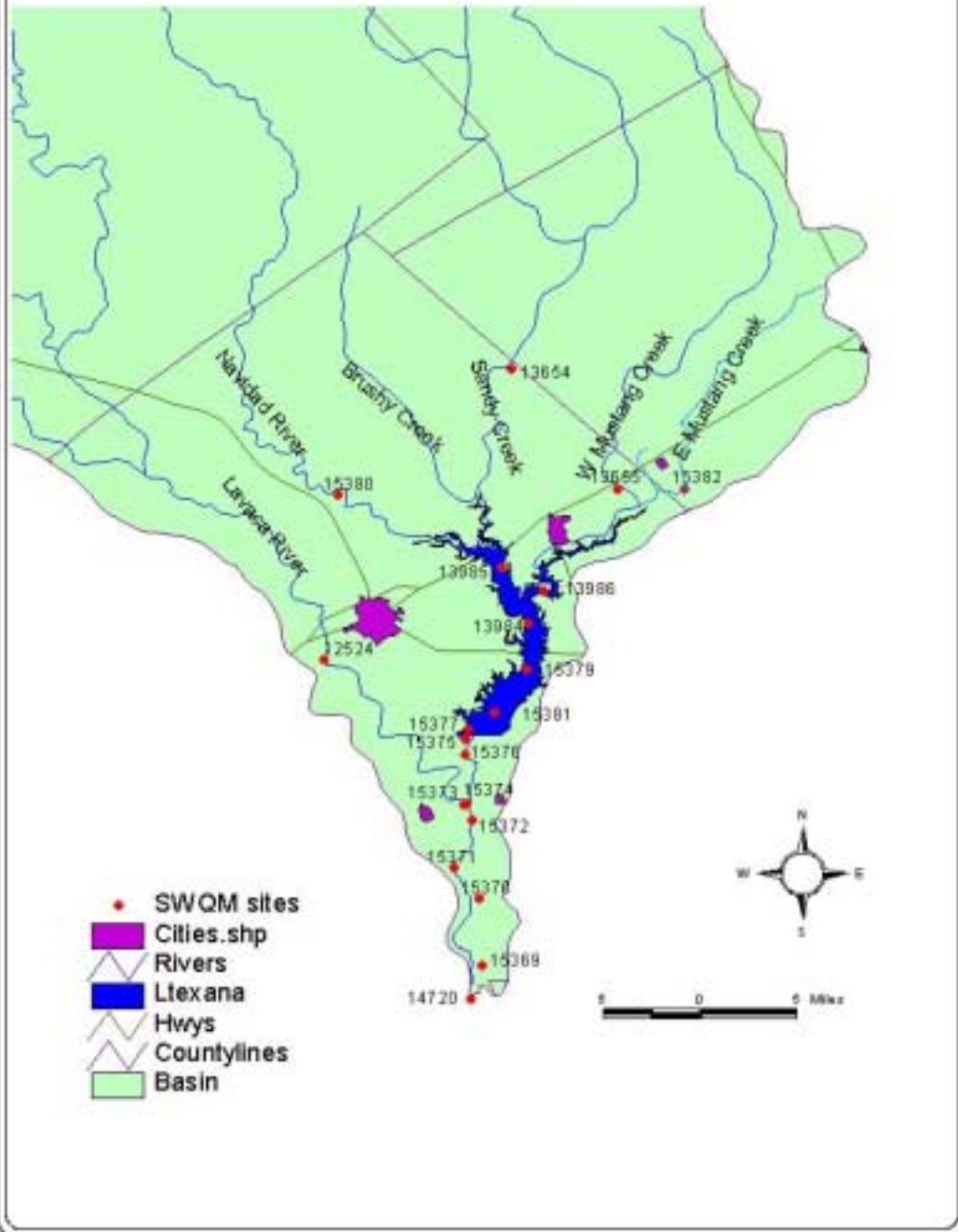


Lavaca Basin Factors Influencing Water Quality



Name	Year Built	Flow	Type	Outfall
Beuda WWT	1895	258,000 gal/day	extended aeration package	Mustang Creek
Lavaca WWT	8	108,000 gal/day		East Mustang Creek
Bea WWT	1875	228,000 gal/day	oxidation & aeration basin	East San Marcos to Lavaca
Moulton WWT	1881	121,000 gal/day	extended aeration	E. prong of Lavaca
Talton WWT	1885	1,280,000 gal/day	extended aeration	Brushy creek to Lavaca
Ballinger WWT	1875	228,000 gal/day	Aeration	San Marcos River
Chicoleta WWT	1884	258,000 gal/day	extended aeration	Brushy Creek to Lavaca
Schickelmeier WWT	1887	258,000 gal/day	biological ditch & aeration	Meridian
Schickelmeier WWT	1878	488,000 gal/day	2 bi. ditches, aeration basin	Meridian

Water Sampling Sites



Monitoring and Sampling Stations
 (Numbers indicate annual frequency)

Segment #	TNRCC #	Description	Latitude	Longitude	Metals in H2O/Sed	Organics H2O/Sed	Conv.	BacT	Flow	Field
1601	15372	Lavaca River @ Frels Landing	28.82332366	-96.57524068						12
	15371	Lavaca River @ Mobile dock	28.78765308	-96.58911447						12
	15370	Lavaca River @ mouth of Redfish lake	28.76513236	-96.57006427						12
	15369	Lavaca River @ mouth of Swan lake	28.71502277	-96.5682295						12
	14720	Lavaca River @ buoy marker #2	28.68935875	-96.57589815			4			12
1602	15373	Lavaca River near confluent	28.83453104	-96.58197576			4	2		12
	12524	Lavaca River @ Hwy 59 bridge	28.96016723	-96.68633843			4	2	12	12
1603	15374	Navidad River 30m above Lavaca	28.83581706	-96.57998553						12
	15375	Navidad River below dam @ Dry Creek	28.87276858	-96.58087656			4			12
	15376	Navidad River below spillway	28.88389037	-96.58111371						12
1604	15377	Lake Texana near spillway	28.89090639	-96.57940983	3 H2O	3 H2O	4			12
	15381	Lake Texana near dam	28.90405586	-96.55949577			4			12
	15379	Lake Texana south of Hwy 111	28.93615191	-96.53466189	3 H2O	3 H2O	4			12
	13984	Lake Texana north of Hwy 111	28.97145679	-96.53404139	3 H2O	3 H2O	4			12
	13985	Lake Texana main body near Hwy 59	29.01625988	-96.5540756			4			12
	13986	Lake Texana - Mustang Creek arm	28.99573954	-96.52387541	3 H2O	3 H2O	4			12
	13654	Sandy Creek @ FM 710	29.15951741	-96.54622804		2 H2O	4		12	12
	15382	East Mustang @ FM 647	28.96016723	-96.68633843	1 sed	1sed/2H2O	4		12	12
	13655	West Mustang @ Hwy 59	29.07200754	-96.46762824	1 sed	1sed/2H2O	4		12	12
1605	15380	Navidad River @ Strane Park bridge	29.06578707	-96.67453325	1 sed	1sed/2H2O	4		12	12