



May 2003

## Sulphur River Basin Clean Rivers Program Overview

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Protection and improvement of water quality in the Sulphur River Basin is a major goal of the Sulphur River Basin Authority (SRBA). The current basin program was implemented through cooperation with the Texas Commission on Environmental Quality (TCEQ) and their Clean Rivers Program (CRP). The Clean Rivers Program, a partnership involving the TCEQ and other state agencies, local governments, industry and citizens, was implemented to maintain and improve the quality of surface water resources within each river basin of Texas. The Sulphur River Basin Highlights Report is a review of the efforts and objectives of the Clean Rivers Program participants during fiscal year 2002. CRP partners that are assisting SRBA in planning, data collection, analysis and reporting include the Texas Commission on Environmental Quality (TCEQ), the Clean Rivers Program Steering Committee members, U. S. Geological Survey (USGS), and Texarkana College. The goal of these cooperative efforts is

to make possible continuing assessment and management of water quality in the basin by providing appropriate, quality assured data.

Monitoring program objectives include providing opportunities for the public to become involved in water quality issues, coupled with presenting reliable water quality information to the public. It is hoped that this enhanced awareness and greater knowledge of water quality conditions in the basin will lead to greater public involvement in water quality issues.

Establishment of a long-term monitoring program for the Sulphur River Basin to examine and evaluate major water bodies on an ongoing basis is another major objective. An established monitoring program would help to determine the suitability of existing water sources for designated uses and document trends in water quality. Through the use of data collected by this monitoring program, water quality problems can be identified and characterized



followed by efforts to determine their source. In addition, an evaluation of the State Surface Water Quality Criteria would be applied by TCEQ to specific water bodies in the basin. Permit requirements with respect to water quality conditions and trends in the basins would be reviewed, and utilizing data collected, a plan would be developed to support the development of cost effective water quality management programs.

High pH and depressed dissolved oxygen levels are the most common concerns for the Sulphur River Basin on the Draft 2002 303(d) List, which identifies water bodies that do not meet the state's water quality standards. Wright Patman Lake, Cooper Reservoir, and the Upper

*(Continued on page 2)*

### Special Points of Interest:

- The Sulphur River Basin website has been greatly expanded. Please check out our site at [www.sulphurr.org](http://www.sulphurr.org) for additional information about our basin.
- Copies of this report are also available from our website.

PREPARED IN COOPERATION WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY  
The preparation of this report was financed through grants from the Texas Commission on Environmental Quality.



## Sulphur River Basin Clean Rivers Program Overview *continued*

*(Continued from page 1)*

South Sulphur River have pH levels that are sometimes higher than the level established to safeguard general water quality uses. Segments listed on the Draft 2002 303(d) List in response to lower dissolved oxygen levels include Wright Patman Lake, South Sulphur River (Segment 0303), White Oak Creek (0303B), Upper South Sulphur River (Segment 303), and Cooper Lake (Segment 307). These lower oxygen levels may reflect natural conditions that occur in waters of East Texas. Both low dissolved oxygen and high pH could be a natural occurrence in the streams of the Sulphur River Basin, especially during summer low flow periods. Algae and other microorganism activity generally increase during warmer weather, which can lead to high pH, and the associated effects can result in lower dissolved oxygen. Other factors, such as municipal wastewater discharges and nutrient addition from other point and non-point sources may also be contributing to the pH and dissolved oxygen exceedances by stimulating algae growth. Concerns about the level of aluminum in water in White Oak Creek will be addressed in FY2003 with quarterly monitoring which includes both conventional and metals in water sampling.

Although atrazine (a widely used herbicide) contamination in finished drinking water has been observed in Big Creek Lake, it was removed from the 2000 303(d) List. Best Management Practices (BMP's) are now in place to ensure that this threatened water body supports the public water supply use. Intensive monitoring over the last two years showed that atrazine values are below the finished drinking water criterion.



## Public Outreach and Website Use

During June of 2002 the [www.sulphurr.org](http://www.sulphurr.org) website was completely refurbished. The primary purpose of our website is to provide the citizens of our basin and other interested parties with a useful information tool which focuses on the Sulphur River Basin. Restructuring of this site also reflects new updates and changes within the electronic communication industry. The Sulphur River Basin Authority (SRBA) is the Sulphur River Basin Partner with TCEQ (Texas Commission on Environmental Quality) in the statewide Clean Rivers Program (CRP). Under this program SRBA has assumed a portion of the responsibility for monitoring the water quality and ecosystem health in the rivers and lakes of the Sulphur River Basin. Information developed through monitoring is critical to understanding how our waterways respond to human activity, and is the primary source of information utilized by those

responsible for managing water quality, and members of the community interested in the health of the basin. Included within our site is a summary of the Clean Rivers Work Plan, current information on water monitoring, water data, basin maps, and special study information in addition to other resources. Our goals include a readily available resource of information to the public, which we hope will in turn encourage citizens of our basin to reach out and get involved in their local environmental issues.

On our website, there are several key elements that help define our goals and provide current information to the public. These elements include:

**Public Participation and Outreach:** One of the most important objectives targeted by our website. Monitoring activities,

events, special studies activities, and meetings dates with agendas are posted regularly with the idea that increased public involvement can result in more public awareness and a larger sense of community responsibility. More volunteerism in our basin is another important goal. Organizations such as Texas Watch, and TCEQ host statewide and regional meetings, partner certification training, special events and projects that are designed to aid in increasing public awareness and involvement. Contact information for these events are easily found on the SRBA homepage or site map.

Check out our Gallery of Volunteers sampling in Sulphur Basin. Dr. Mike Buttram directs his students from Texarkana College on habitat and water-sampling excursions. This type of activity provides the opportunity for students to explore our water quality issues first hand and conduct a science experiment at the

*(Continued on page 3)*

## Public Outreach and Website Use *continued*

(Continued from page 2)

same time. If you have ever wondered what is going on in your own backyard, walking through the creeks of the Sulphur River Basin will open your eyes to potential environmental problems and how the public can assist the efforts to correct these problems. Questions or comments concerning any information found on our website are always welcome

**Texas Watch:** Is a highlighted feature throughout our website. Through Community Action Projects Texas Watch empowers communities with powerful strategies that encourage actions focused on correcting environmental problems. Some of these strategies include trash clean-ups, stream bank stabilization, and storm drain

stenciling. Assistance with the assessment of water quality information is also available on a limited basis, and is generally focused in areas where interest in environmental problems will possibly inspire citizens to create positive change. Texas Watch may also help communities with data screening, data analysis, and problem identification within these selected target areas.

**Basin Steering Committee Meetings:** Held at least once a year the meeting announcements and minutes are updated regularly on our website. Meeting agendas are structured to promote public involvement and serve as a review of achievable water quality objectives and priorities for the basin. Steering Committee meeting minutes are available from the

homepage or the site map. Open to the public, these meetings are designed to be forums for public comment and input on water quality issues.

**Quality Assurance:** To the greatest extent possible, the data produced by the Clean Rivers Program (CRP) is of the highest quality required for its intended use. The Quality Assurance Project Plan includes a series of checks and balances that are used in the operation of all CRP activities. Our website contains current information regarding several aspects of quality assurance project plans.

**Water Quality Monitoring:** On the website you will find Coordinated Monitoring Schedules listing all the scheduled monitoring in our

basin being done in the current fiscal year, and maps of all areas which have been sampled on either past or present schedules. Current water quality data are posted at least quarterly, and includes specifics of the sampling location and date.

**Data Analysis and Reporting:** As a major focus of the Clean Rivers Program website, compiled data maps and reports are the result of the information we gather and evaluate. Special studies reports such as the Wright Patman Lake Study can be downloaded or printed from the website.

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## Monitoring within the Sulphur River Basin

Assessment and management of water quality within the Sulphur River Basin is dependant on appropriate, and accurate data. Water quality monitoring and data collection is an integral part of the Clean Rivers Program (CRP). This monitoring is made possible through a cooperative program directed by the Sulphur River Basin Authority (SRBA). Program participants assisting SRBA in planning, data collection, analysis, and reporting of water quality data include Texarkana College, the Texas Commission on Environmental Quality (TCEQ), U. S. Geological Survey (USGS), and Steering Committee members.

Sampling locations within the basin in 2002 and 2003 incorporate three types of monitoring. These monitoring types include: 1) Fixed/Routine, 2) Intensive/Systematic and 3) Special Study. Within each of these monitoring types there can be samples taken that are designated as DI (diel), these samples are multiple field measurements conducted over a 24hr period. A fiscal year 2003 table that includes all sampling stations, their sampling parameters, and the entities which sample them is located on page 6. In addition, a map showing all sample locations is included on page 7 of this report. The Monitoring Parameter Table found on page 6 contains a detailed explanation of each parameter type sampled in the Sulphur River Basin.

Fixed/Routine Station monitoring is primarily used to maintain and expand the long-term water quality database. This monitoring improves our ability to follow trends and to identify water quality changes in the major sub-basins of the Sulphur River Basin. Station locations provide ongoing monitoring at locations that have previously been sampled. Fixed/Routine stations are situated to provide information on each of the seven classified segments (numbered 0301-0307) within the Sulphur River Basin. Please refer to the map showing the location of each of the classified segments that is included within this report.

During 2002, 17 fixed/routine stations were sampled for field and conventional parameters by the TCEQ Region 5 staff and the Sulphur River Basin Authority. The site on Days Creek at South State Line (Segment 304-Station ID 10026) was the only station categorized as "routine" sampled by the Sulphur River Basin Authority. This site is located below the Texarkana Waste Water Treatment Plant on Stateline Road. This stream is subject to regular highs and lows caused from the storm water runoff from the City of Texarkana. In the past, Days Creek has had some high bacteria counts. The four monitoring events that occurred at this

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## Monitoring within the Sulphur River Basin *cont.*

(Continued from page 3)

station included field parameters, conventional parameters, *E. coli* bacteria counts, and metals in both water and sediment. The data collected during field monitoring (pH, dissolved oxygen, temperature, secchi depth and conductivity) were all in ranges typical of many streams in East Texas. The *E. coli* bacteria counts were elevated above normal levels with a range of 93 to 344 colonies per hundred milliliters. Water chemistry analysis revealed elevated levels of nitrate-nitrite nitrogen with a range of 4.28 ppm to 6.44 ppm. The monitoring at this site also included biological studies composed of a habitat assessment, aquatic invertebrate survey, and fish survey. The aquatic life use ratings for the invertebrate, fish and habitat assessments were determined to be "intermediate" with the exception of an aquatic invertebrate rating during May that was "limited". A number of reasons could have caused the low aquatic invertebrate score including disturbance of the hydrocarbon residues in the stream silt by spring rains. The "intermediate" habitat score is not uncommon for streams in Northeast Texas. These streams have minimal slope, which leads to a slow flow and bottoms that tend to be covered with silt and sand.

The Days Creek site often has a sheen on the waters surface. Wading in the creek frequently causes noticeable amounts of hydrocarbon residue to be released from the sediments. Sediment samples collected and analyzed from this station

during a FY 2001 intensive/systematic study had high levels of polyaromatic hydrocarbons, PAHs. These compounds are used in wood treatment processes at locations upstream of the site. The elevated PAH problem in sediment has been noted in past studies done by the TCEQ. A special study is proposed for Days Creek in FY 2004 to evaluate the extent and impact of the PAH contamination in the sediment. The Days Creek at Stateline Rd. station is included in the routine monitoring for FY 2003 and is proposed in the FY 2004 Coordinated Monitoring Schedule.

Three sites on Wright Patman Lake were studied during FY 2002. The sites, classified as routine, are IP Intake (Station 16859), North Shore (Station 15061), and Hwy 8 (Station 10214). Monitoring was conducted at the sites four times for field parameters, water chemistry, and depth profiles, and six times for diurnals. Wright Patman Lake has a history of low dissolved oxygen, high pH and high chlorophyll levels. The studies tended to support previous data which indicated that during the summer months the pH was elevated and the chlorophyll levels were high. The 24-hour average dissolved oxygen concentration was below 4.0 ppm on two occasions at the Hwy 8 site. During the summer months pH and DO concentrations tend to undergo large swings with low DO and pH at night and high values during the day. This behavior is characteristic of lakes with a high level of photosynthesis. These sites

are being studied as part of the routine monitoring in FY 2003 and are proposed in the Coordinated Monitoring Schedule for FY 2004. A total of 20 routine stations are scheduled to be sampled by TCEQ regional offices and SRBA during FY2003.

Intensive/Systematic monitoring stations are primarily located on smaller streams or subwatersheds of the designated segments. The monitoring schedule for this program is based on a five-year-cycle, with one group of stations monitored each of the five years, and complete coverage of the basin accomplished at the end of the rotation. Different sub-watershed areas of the basin and their stations are sampled four times during the year of study to provide information on water quality conditions in those areas that are not normally studied.

In fiscal year 2002 the focus of Intensive/Systematic monitoring was on the subwatersheds of the South Sulphur River (Segment 0303), and North Sulphur River (Segment 0305). The sampling sites included Kickapoo Creek at Red River CR 412 (Station 17342), Little Mustang Creek at Lamar CR 1410 (Station 17343), Cuthand Creek at FM 1487 (Station 10202), Big Sandy Creek at Lamar CR 1497 (Station 10205), Auds Creek at Lamar County Rd 1184 (Station 10197) and Hickory Creek at Lamar CR 1498 (Station 17344). Studies conducted at each of the sites included field parameters, *E. coli* counts, water chemistry, habitat analysis, aquatic invertebrates and fish.

Data from all six of these sites yielded results that are similar to data collected at other sites in northeast Texas with a few exceptions. The conductivity tended to be higher than what is seen in the lower basin. The values ranged from 69 umhos/cm to 975 umhos/cm. Values of 600-800 were not uncommon with the highest value occurring on Cuthand Creek. These conductivity values may be natural or due to more extensive row crop operations in the upper basin. The lower portion of the Sulphur River (Segment 303) has a higher conductivity than does the surrounding tributaries. The runoff from upstream is the likely source of these electrolytes. The *E. coli* counts were also high, ranging from 48 to 1553 per hundred milliliters with the highest count found at Big Sandy Creek. This portion of the basin has extensive cattle operations and abundant wildlife, so it is not surprising to see high *E. coli* counts,

(Continued on page 14)

**A schedule of the water quality monitoring planned for fiscal year 2003 in the Sulphur River Basin is provided on Page 6.**

**A Sulphur River Basin Map showing the location of stations scheduled to be monitored in 2003 can be found on Page 7.**

Comments or suggestions concerning this Basin Highlights Report should be directed to the:  
 Sulphur River Basin Authority  
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 Wake Village, Texas 75501

Phone (903) 223-7887, Fax (903) 223-7988,  
 e-mail: mburkesrba@cableone.net, or use our website link at  
[www.sulphurr.org](http://www.sulphurr.org).

## Parameters Are What We Measure

**Field Parameters** provide basic information about the physical, chemical and biological condition of the water or sediment and are measured at all of the stations at the time of every visit. Field parameters must be measured immediately to obtain meaningful results because they are extremely sensitive to environmental change.

**Conventional Parameters** are materials (including some bacteria) that are normally found dissolved or suspended in natural waters. The amounts and relative proportions of these materials usually determine water quality. The materials considered include the amount of various mineral salts, nutrients, suspended sediments, and biological activity including the potential for the presence of harmful bacteria. These parameters must generally be measured under laboratory conditions to achieve acceptable accuracy.

**Metal Parameters** in both water and sediment are measured to assess the potential for exposure of either humans or the aquatic community to toxic concentrations of metals. Some of these metals (such as iron and zinc) are very common in the environment, while others, like mercury and cadmium, are not. Although only small amounts of metals are ordinarily present in water, requiring painstaking care to measure accurately, substantial amounts of various metals may be present in sediments,

**Biological and Habitat Evaluations** are performed at stream stations that are not too deep to cross twice a year during the low flow period of summer. These measurements are used to assess the streams aquatic community composition, integrity, and current aquatic life use. Included are sampling for benthic, or bottom dwelling organisms, fish, and habitat characteristics. The data that are collected are assessed according to the 1999 Texas Commission on Environmental Quality Surface Water Quality Monitoring Procedures Manual and 1999 Receiving Waters Assessment Procedures Manual.

### Monitoring Parameters\*

Field Parameters	Conventional Parameters	Organics in Water	Metals		Biological and Habitat Evaluations
			In Water	In Sediment	
Temperature pH Water color and odor Dissolved Oxygen Depth Conductivity Stream Flow Secchi Depth (clarity)	Total Suspended Solids (TSS) Total Dissolved Solids (TDS) Volatile Suspended Solids (VSS) Total Kjeldahl Nitrogen (TKN) Total Organic Carbon (TOC) Total Alkalinity Pheophytin-a, Chlorophyll-a Sulfate Chloride, Ammonia-Nitrogen E. coli, Fecal coliform Ortho-phosphate, Nitrate/Nitrite-Nitrogen, Total Phosphorus	Herbicides Pesticides	Aluminum Arsenic Cadmium Chromium Copper Lead Mercury Nickel Selenium Silver Zinc Calcium Magnesium Hardness	Aluminum Arsenic Barium Cadmium Chromium Copper Lead Manganese Nickel Selenium Silver Zinc Total Organic Carbon Sediment Grain Size Oil and Grease Acid Volatile Sulfide Solids in Sediment	Nekton (fish)  Benthic Macroinvertebrates (bottom dwelling organisms)  Physical Habitat Characteristics (flow, slope, depth, substrate, instream cover etc.)

\* Parameters analyzed at each station may vary depending on sampling entity

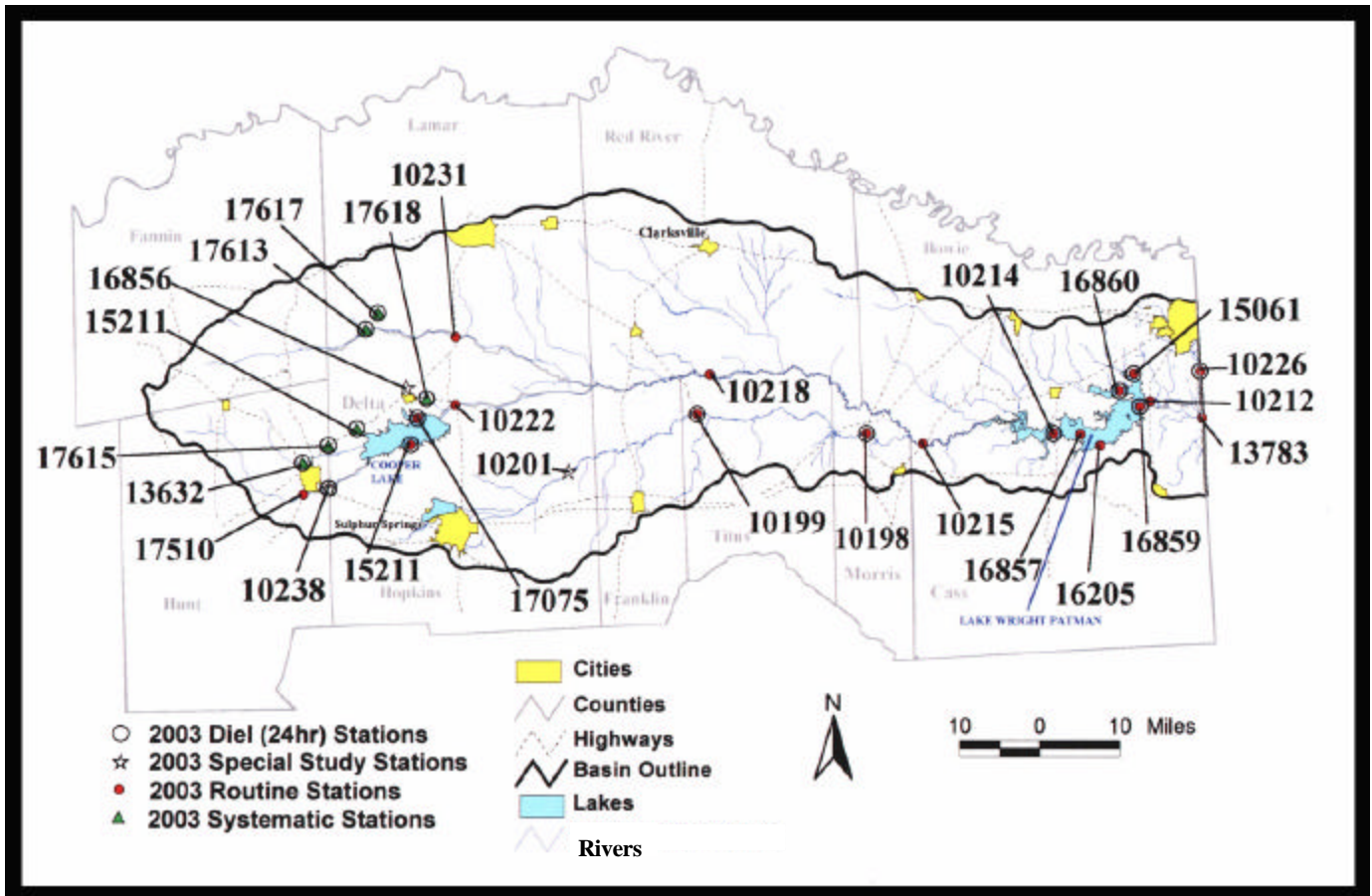
## Sulphur River Basin Fiscal Year 2003 Coordinated Monitoring Schedule

Fiscal Year 2003 Coordinated Monitoring Schedule for the Sulphur River Basin																
Segment	Station ID	Site Description	Sampling Entity*	Prog Code **	E. coli 24Hr DO	Aq. Hab	Routine Benthics	Routine Nekton	Metals in Water	Organics in Water	Metals in Sediment	Conventional	Fecal Coliform	Flow	Field	
0301	10212	Sulphur River at US59 North of Atlanta	WC/FO	RT	4							4	4	4	4	
0301	13783	Sulphur River at KCS R/R Bridge	WC/FO	RT	4							4	4	4	4	
0302	16859	Wright Patman Lake at IP intake	WC/FO	RT	4							4	4	4	4	
			SU/TC	RT	4							4	4	4	4	
			SU/TC	DI	2											
0302	15061	Wright Patman Lake, at North Shore	WC/FO	RT								4	4	4	4	
			SU/TC	RT	4							4		4	4	
			SU/TC	DI	2											
0302	16860	Wright Patman Lake in Big Creek Arm	WC/FO	RT	4						4			4		
0302	16205	Wright Patman Lake mid lake, at Atlanta State Park	WC/FO	RT	4						4			4		
0302	16857	Wright Patman Lake upper lake, ~1 mi SE of McFarland Island	WC/FO	RT	4						4			4		
0302	10214	Wright Patman Lake at SH 8	SU/TC	RT	4							4			4	
			SU/TC	DI	2											
			WC/FO	RT	4							4		4	4	
0303	17618	Big Creek at Hwy 154	SU/TC	IS	4	2	2	2				4		4	4	
			SU/TC	DI	2											
0303	10218	Sulphur River at CR 2152 (Talco)	USGS	RT					2		1	6			6	
			WC/FO	RT								4	4	4	4	
0303	10215	Sulphur River at US67	WC/FO	RT					4			4	4	4	4	
0303	10198	White Oak Creek at US 259	WC/FO	RT	4				4			4	4	4	4	
			WC/FO	DI	2											
0303	10199	White Oak Creek at US 271	WC/FO	RT												
			WC/FO	DI	2								4	4	4	4
0303	10201	White Oak Creek at CR 900	WC/FO	SS								4	4	4	4	
			WC/FO	DI	2											
0303	10222	South Sulphur River at SH19 East of Cooper	WC/FO	RT								4	4	4	4	
0303	16856	Big Creek Lake	WC/FO	SS						12		4	4		12	
0304	10226	Days Creek at State Line Road South of Texarkana	SU/TC	RT	4	2	2	2				4		4	4	
			SU/TC	DI	2											
0305	17617	Rowdy Creek at FM38	SU/TC	IS	4	2	2	2				4		4	4	
			SU/TC	DI	2											
0305	17613	North Sulphur River at FM126	SU/TC	IS	4	2	2	2				4		4	4	
			SU/TC	DI	2											
0305	10231	North Sulphur at SH19	WC/FO	RT								4	4	4	4	
0306	17510	South Sulphur River at SH50	WC/FO	RT									9	9		
0306	10238	South Sulphur River at Hwy 11	WC/FO	RT								4	9	9	4	
			WC/FO	DI	2											
0306	10238	South Sulphur River at State Hwy11	WC/FO	SS		2	2	2								
0307	17614	Jernigan Creek at Hwy24	SU/TC	IS	4	2	2	2				4		4	4	
			SU/TC	DI	2											
0307	17615	Pecan Creek at Hwy 24	SU/TC	IS	4	2	2	2				4		4	4	
			SU/TC	DI	2											
0307	13632	Middle Sulphur River at Commerce	SU/TC	IS	4	2	2	2				4		4	4	
			SU/TC	DI	2									2		
0307	15211	Cooper Lake at North Texas Municipal raw water intake	WC/FO	RT								4	4		4	
			WC/FO	DI	2											
0307	17075	Cooper Lake near mouth of Doctors Creek Arm	WC/FO	RT	4							4			4	
			WC/FO	DI	2											

\* WC = TCEQ, FO = TCEQ regional office, SU = SRBA, TC = Texarkana College

\*\* RT=Routine /Fixed sampling, DI=DIEL sampling, IS=Intensive/ Systematic sampling, and SS=Special Study sampling

## Sulphur River Basin FY2003 Scheduled Monitoring Stations



## Sulphur River Basin Additional Sampling Projects

### Wright Patman Lake

In 2000, the federal Clean Water Act Section 303(d) list indicated depressed dissolved oxygen and elevated pH concerns for Wright Patman Lake. Section 303 (d) of the national Clean Water Act requires the Texas Commission on Environmental Quality (TCEQ) to identify water bodies, which do not meet the state’s water quality standards. This identification leads to the development of the 303(d) list. An evaluation by the Texas Commission on Environmental Quality (TCEQ) concerning possible problems in a water body requires ten sampling events over a period of five years. Because the number of samples previously collected was too small to define the impairment or justify expenditure of funds to initiate a Total Maximum Daily Load (TMDL) project which would include a plan of action that both identifies parties responsible for reduction of water quality and prescribes specific corrective actions, additional sampling was required in order to complete the required data set.

The additional sampling within the Sulphur River Basin in 2002 supplemented sampling efforts by the TCEQ by supplying six additional monitoring events of 24-hour pH and diurnal dissolved oxygen sampling at each of three stations on Wright Patman Lake. The stations sampled included Wright Patman Lake at the International Paper intake, Wright Patman Lake on its north shore at Clear Spring Park, and Wright Patman Lake at SH 8. The sites selected for the study are of interest to stakeholders due to their proximity to the water intake stations for local water utilities. In addition, more information was collected about nutrient levels in the lake, which may indirectly influence the dissolved oxygen and pH concentrations. After the 2002 data has been collected and analyzed there should be a sufficient amount of data for TCEQ to evaluate the

*(Continued on page 10)*

## The 2002 Clean Water Act 303(d) List

Section 303(d) of the federal Clean Water Act requires the Texas Commission on Environmental Quality (TCEQ) to identify water bodies, which do not meet the state's water quality standards. Based on this information, a list is developed to prioritize the development of special projects that examine measurable assessments of water quality problems and their contributing pollutant sources. A map detailing the location of some of the factors that influence water quality within the Sulphur River Basin is included in this report. These projects are identified as Total Maximum Daily Load (TMDL) projects, and include a plan of action that both identifies parties responsible for reduction of water quality and prescribes specific corrective actions. The TCEQ develops a overall status listing for TMDL projects that are ongoing, scheduled or planned based on specific data analysis's prepared for each segment. The causes for impairment identified by the TCEQ and the status of management practices for water bodies in the Sulphur River Basin are summarized in the table below. This table was based on the 2002 Draft 303(d) list that was produced in October 2002.

Major streams and reservoirs within the Sulphur River Basin have been divided into segments by the TCEQ for water quality management activities. Included within this report is a map that specifies the location of each segment within the Sulphur River Basin. Big Creek Lake (Segment 303A), an unclassified water body, was listed on the Final 2000 303(d) List due to elevated atrazine concentrations in finished drinking water even though all other water quality measurements supported its use as a public water supply. Big Creek Lake has been removed from the October Draft 2002 303(d) list as a result of intensive monitoring over the last two years which demonstrated that atrazine values are below the finished drinking water criterion. Best Management Practices (BMP's) are in place to ensure that this threatened water body supports the public water supply use.

### Sulphur River Basin 303 (d) Listings in 2002 <sup>1</sup>

Segment Number and Segment Name	Overall Status <sup>2</sup>	Listed on 2000 303 (d) List ?	Parameter(s) of Concern	Additional Information
0302 Wright Patman Lake	C	Yes	depressed dissolved oxygen  high pH	The dissolved oxygen levels in the upper and lower segments of the lake are sometimes lower than the criterion established to assure optimum conditions for aquatic life.  pH levels in the upper and middle segments of the lake are occasionally higher than the criterion established to safeguard general water quality uses.
0303B White Oak Creek	B	Yes	depressed dissolved oxygen	The dissolved oxygen levels in the lower and middle segments are sometimes lower than the criterion established to assure optimum conditions for aquatic life.
0306 Upper South Sulphur River	C	Yes	depressed dissolved oxygen  high pH  bacteria	The dissolved oxygen levels in the lower segment are sometimes lower than the criterion established to assure optimum conditions for aquatic life.  pH levels in the upper segment are occasionally higher than the criterion established to safeguard general water quality uses.  Bacteria levels in the lower segment sometimes exceed the criterion established to assure the safety of contact recreation
0307 Cooper Lake	C	Yes	depressed dissolved oxygen  high pH	The dissolved oxygen levels in the lower segments are sometimes lower than the criterion established to assure optimum conditions for aquatic life.  pH levels in the lower and middle segments are occasionally higher than the criterion established to safeguard general water quality uses

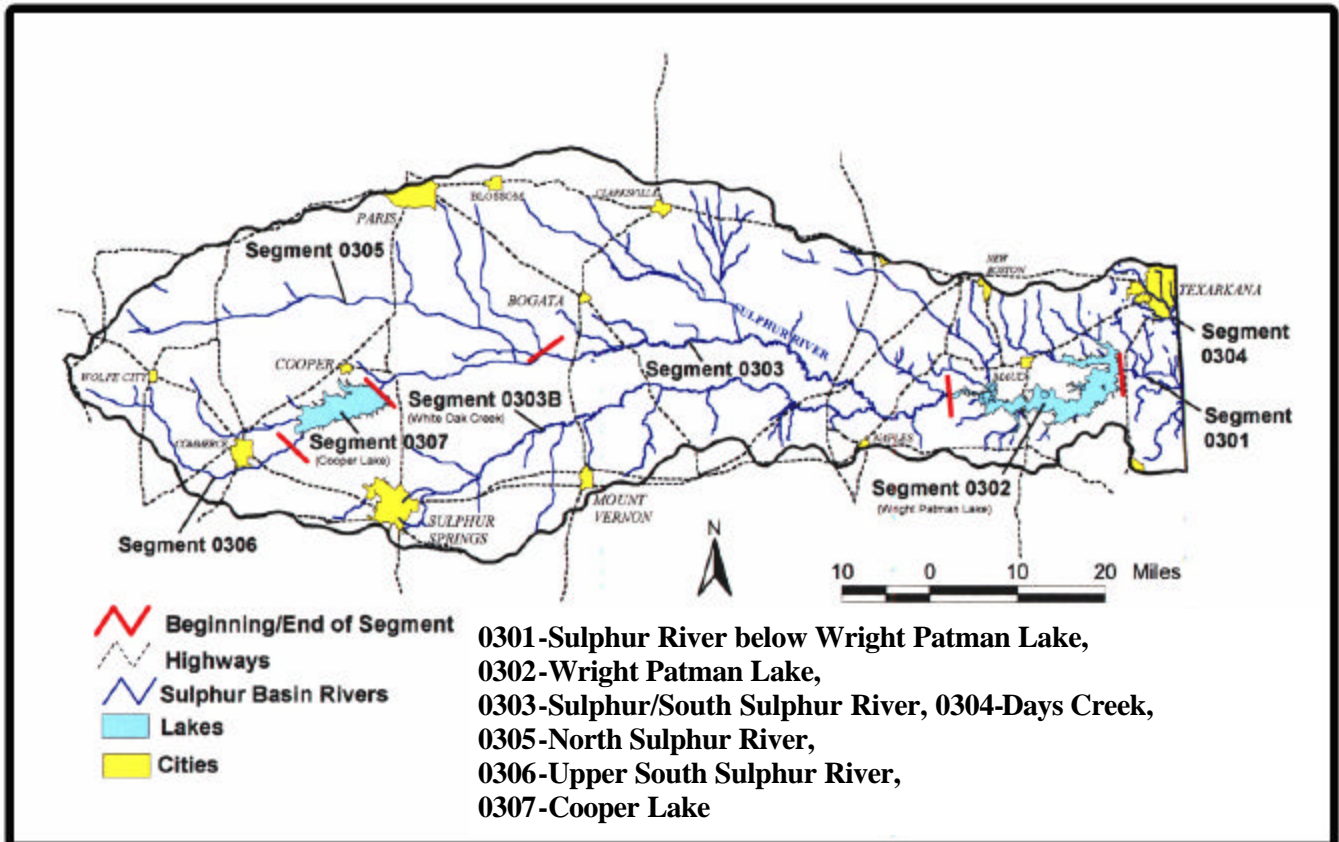
<sup>1</sup> Information summarized from the Draft 2002 Texas 303(d) List, October 1, 2002

<sup>2</sup> The overall status of current management activities of the water body is categorized as follows:

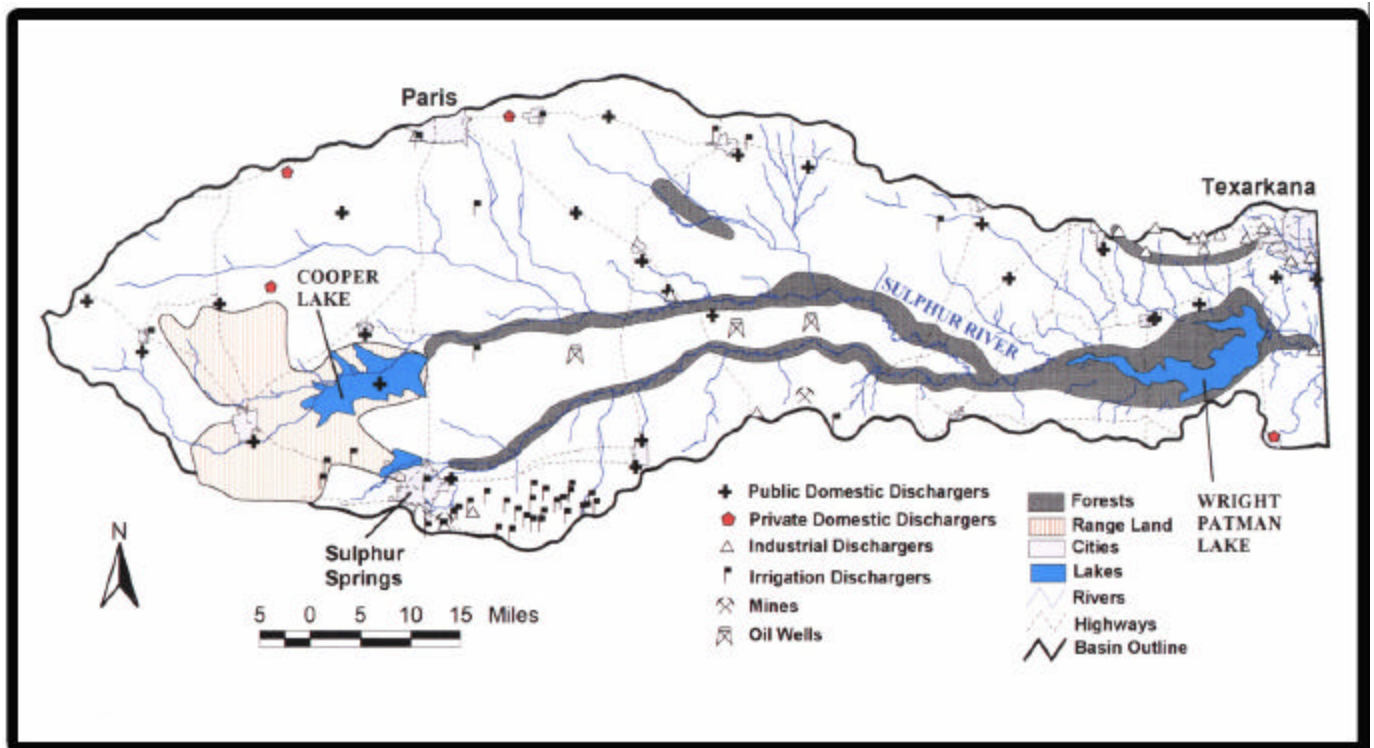
A = A TMDL project is underway, scheduled, or will be scheduled, B = A review of the water quality standards for this water body will be conducted before a TMDL project is scheduled, C = Additional data and information will be collected before a TMDL project is scheduled



## Sulphur River Basin Designated Segments



## Possible Factors Influencing Water Quality



## **Sulphur River Basin Additional Sampling Projects *Continued***

*(Continued from page 7)*

current concerns for Wright Patman Lake.

The results of sampling to date support the 303(d) listing of Wright Patman Lake for high pH values and low levels of dissolved oxygen during some of the sampling events. The elevated pH and depressed DO averages are thought to be the result of high levels of photosynthetic activity occurring during weather conditions favorable for algae growth. Photosynthesis can cause a depletion of dissolved oxygen during the night and a rise of pH during the daylight hours by removing carbon dioxide from the water.

Further sampling may be needed to identify the source of the nutrients that support the abundant algal growth. A study of the nutrients in the streams contributing to Wright Patman Lake as well as a study that illustrates the recycling of nutrients from sedimentary material may help identify the source.

### **Atrazine Study In Big Creek Lake**

As of March 2002, two years of monitoring by the TCEQ for atrazine, a widely used herbicide, have been completed at Big Creek Lake. Big Creek Lake is a small, unclassified reservoir of about 700 acres that was listed as threatened by contamination on the 2000 303(d) list due to atrazine in finished drinking water.

The Big Creek Lake study was part of a larger project conducted by the TCEQ involving several Texas reservoirs, titled "Targeted Monitoring and BMP implementation in Seven Atrazine Threatened Lakes." The two major components of the project are: (1) surface water quality monitoring to better distinguish the threat of atrazine to drinking water sources, and (2) implementation of best management practices (BMP'S) to reduce the addition of atrazine in the subject watersheds.

The TCEQ Region 5 staff conducted monthly surface water quality monitoring in Big Creek Lake for atrazine, alachlor, metolachlor and simazine. To eliminate the effects of water treatment, only raw (untreated) water was sampled.

These first two years of data were reviewed by the TCEQ to assess the degree of atrazine contamination and determine if further action was warranted. As a result of this study, Big Creek Lake was removed from the Draft 2002 303(d) list in October 2002. It was determined that the intensive monitoring over the two year period demonstrated that atrazine values were below the finished drinking water criterion. In addition, Best Management Practices (BMPs) are now in place to



## **Sulphur River Basin Action Summary**

The Basin Action Summary provides for each watershed within the basin, a summary of data collection and assessment efforts, and implementation recommendations. It is the key source of information used to plan specific monitoring in areas that have a possible problem.

A tabular format is used to summarize previous assessment findings, data collection activities and input from stakeholders. Information included in the Basin Action Summary Table includes water quality impairments and concerns, local water quality issues, the possible reason for the impairment, concern, or issue, monitoring and implementation activities to date and recommended actions. Future monitoring and assessment activities in the basin will be organized and focused by utilizing this table as a planning tool. Please see the Sulphur River Basin Action Summary for 2003 on the facing pages.

## Sulphur River Basin Action Summary

<b>BASIN ACTION SUMMARY FOR SULPHUR RIVER BASIN FY 2002-2003</b>						
Watershed Waterbody	Concern/ Impairment	Identified Parameter(s)	Potential Source	Actions Taken	Recommended Action(s)	Priority
<b>Sulphur River Below Wright Patman Lake (Segment 0301)</b>						
Sulphur River below Wright Patman Lake	General Water Quality Conditions	Concern about Chlorophyll-a and Ammonia-nitrogen	Non-point source Releases from Wright Patman Lake	Fixed sampling by TCEQ in 2002.	Monitoring by CRP, TC, TWA and TCEQ during normal scheduled monitoring events.	M
Sulphur River below Wright Patman Lake	Algal growth concern, and nutrient enrichment concern.	Concern about total phosphorus, and excessive algal growth.	Non-point source Point source	Fixed sampling by TCEQ in 2002.	Monitoring by CRP, TCEQ during normal scheduled monitoring events.	M
<b>Wright Patman Lake Watershed (Segment 0302)</b>						
Tributaries of Wright Patman Lake	Aquatic Life	Depressed Dissolved Oxygen	Non-point source -natural occurrence	Systematic Routine sampling by TCEQ2002.	Concern over application for extension of permitted discharge extension for U.S. Army Red River permit.	L
Wright Patman Lake	Aquatic Life	Depressed Dissolved Oxygen	Point Source – Non-point Source -natural occurrence	Fixed station monitoring by TCEQ 2002. Additional 24hr sampling by SRBA 2002.	Monitoring through TCEQ fixed sampling. Concern over application for extension of permitted discharge extension for U.S. Army Red River permit.	M
Wright Patman Lake	Aquatic Life	Levels of pH periodically above criterion	Point Source – Non-point Source -natural occurrence	Fixed station monitoring by TCEQ 2002. Additional 24hr sampling by SRBA 2002.	Monitoring through TCEQ fixed sampling. Concern over application for extension of permitted discharge extension for U.S. Army Red River permit.	M
Wright Patman Lake	Temperature	Concern-due to limited data		Fixed Station monitoring by TCEQ.	Concern over application for extension of permitted discharge extension for U.S. Army Red River permit.	L
Wright Patman Lake	Phosphorus	Concern	Unknown source, Unknown nonpoint source	Fixed Station monitoring by TCEQ.	Concern over application for extension of permitted discharge extension for U.S. Army Red River permit.	L
Wright Patman Lake	Public Water Supply	Taste and Odor	Bacteria and Algae	Taste and Odor Study completed 2002.	Taste and Odor Study questionnaire completed. Concern over application for extension of permitted discharge extension for U.S. Army Red River permit.	M

H=high, M=Medium, L=Low

## Sulphur River Basin Action Summary Continued

Watershed Waterbody	Concern/ Impairment	Identified Parameter(s)	Potential Source	Actions Taken	Recommended Action(s)	Priority
<b>Sulphur/South Sulphur River Watershed (Segment 0303)</b>						
Sulphur/South Sulphur River Entire Segment	Aquatic Life	Depressed Dissolved Oxygen	Non-point source -natural occurrence	CRP Fixed Station Monitoring by TCEQ in 2002. Systematic Sampling by SRBA within segment 2002. Special Study by TCEQ for Atrazine in water for Big Creek Lake Completed 2002.	Continued monitoring through fixed and systematic monitoring. Based on new data, concentrations of dissolved oxygen met the criterion set for aquatic life use and has been delisted as a concern  Discussion continuing on proposed Marvin Nichols Reservoir.  Questions and concerns about log jam present at point where Sulphur River crosses Highway 37.	L
Big Creek Lake (Segment 0303A)	Finished Drinking Water	Atrazine	Non-point source -Agriculture	Monitoring by TCEQ Special Study scheduled during FY 2002	Continued Monitoring by CRP and TCEQ during normal scheduled monitoring event in 2002. Alachlor, metolachlor and simazine were also monitored. Removed from (303)d list October 2002. Best Management Practices (BMPs) are in place to ensure that this threatened water body supports the public water supply use. Intensive monitoring over the last two years demonstrates that atrazine values are below the finished drinking water criterion.	L
White Oak Creek (Segment 0303B)	Aquatic Life	Depressed Dissolved Oxygen in lower 50 miles of creek	Point Source  -Non-point source -natural occurrence	CRP Fixed Station and diel monitoring in 2002 by TCEQ.	Continued monitoring during FY 2002 through routine station sampling along White Oak Creek.	M
White Oak Creek (Segment 0303B)	Aquatic Life	Aluminum (acute) in water—limited data.	Point Source –  Non-point source -natural occurrence	CRP Fixed Station monitoring in 2002 by TCEQ.	Continued monitoring during FY 2002 through routine station sampling along White Oak Creek.	M
<b>Days Creek Watershed (Segment 0304)</b>						
Days Creek	Contact Recreation Use concern	Limited data available for bacteria, and other pathogens more sampling needed.	Point Source,  Non-point source	Routine Sampling in 2002 by TCEQ.	Continued monitoring, through fixed stations. Lack of a sufficient number of samples to make an assessment.	L

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## Sulphur River Basin Action Summary Concluded

Watershed Waterbody	Concern/ Impairment	Identified Parameter(s)	Potential Source	Actions Taken	Recommended Action(s)	Priority
<b>Upper South Sulphur River Watershed (Segment 0306)</b>						
Upper South Sulphur River	General Water Quality Uses	Values for pH periodically higher and lower than the criterion	Non-point sources	Fixed Station Monitoring by TCEQ and CRP.	Monitoring through TCEQ and CRP fixed and systematic monitoring Questions and concerns about log jam present at point where Sulphur River crosses Highway 37.	L
Upper South Sulphur River	Aquatic Life	Depressed Dissolved Oxygen in lower 6 miles	Non-point source -natural occurrence	Fixed Station Monitoring by TCEQ.	Monitoring FY2002 through TCEQ and CRP fixed monitoring.	M
Upper South Sulphur River	Nutrient Enrichment Concern	Nitrate+nitrite nitrogen orthophosphorus	Point Source -WWTP -Non-point source -Leaking septic systems -Agriculture	Fixed Station Monitoring by TCEQ and CRP.	Monitoring through TCEQ and CRP, fixed monitoring..	L
<b>North Sulphur River (Segment 0305)</b>						
North Sulphur River				Intensive and diel station monitoring by SRBA, and routine monitoring by TCEQ in 2002.	No specific concerns listed on draft 2002 (303)d at this time.	
<b>Cooper Lake Watershed (Segment 0307)</b>						
Cooper Lake	Aquatic Life	Depressed Dissolved Oxygen in the lower 8,000 acres	Non-point source -natural occurrence -unknown point source	Routine monitoring by TCEQ in 2002.	Continued Monitoring by CRP and TCEQ during normal scheduled monitoring events.	M
Cooper Lake	General Water Quality Uses	Periodic exceedences in pH criterion	Non-point source -natural occurrence -unknown point source	Routine monitoring by TCEQ in 2002.	Continued Monitoring by CRP and TCEQ during normal scheduled monitoring events.	M
Cooper Lake	Contact Recreation Use	Bacteria concern—limited data.	Non-point source -natural occurrence -unknown point source	Routine monitoring by TCEQ in 2002.	Continued Monitoring by CRP and TCEQ during normal scheduled monitoring events.	M

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### Monitoring within the Sulphur River Basin *concluded*

*(Continued from page 4)*

particularly after rains that cause an elevation in stream levels.

The 24-hour dissolved oxygen studies yielded good results for all the streams with the exception of Little Mustang Creek where one field measurement for dissolved oxygen was 3.14 mg/L. During the fourth monitoring event the average dissolved oxygen value was 3.6 mg/L (maximum-4.13 and minimum-3.08). The low average DO concentration was observed when the flow was low and the temperature was high. This stream, located downstream from Bogota, Texas is highly shaded, has limited photosynthesis and a sewage-like odor.

All of the streams sampled had a habitat quality of “intermediate” with the exception of Kickapoo Creek, which was classified as “limited”. Kickapoo Creek has been extensively channeled in the past over the stretch evaluated, and no tree canopy is present. The bottom is hard clay with no cobble or gravel. All factors which can lead to a low habitat score. This stream would probably score “intermediate” if a different site along it was selected. During the May monitoring event the aquatic invertebrate score was “high” or “intermediate” for all the intensive/systematic streams. During the July monitoring the aquatic invertebrate score was “intermediate” for all the streams with the exception of Hickory Creek and Big Sandy Creek. The flow in Hickory Creek was very low and the stream has little or no shade. The bottom is mostly limestone over the stretch evaluated. Big Sandy Creek has a fine sand bottom that is not a good habitat when the flow is low. The fish studies produced an “intermediate” score for all the streams.

The six stations of the systematic monitoring program for FY2003 are located in the subwatersheds of the South Sulphur River (segment 303), North Sulphur River (Segment 0305), and Cooper Lake (Segment 0307). Streams monitored during the 2003 fiscal year include Big Creek, Rowdy Creek, Jernigan Creek and Pecan Creek, in addition to the North and Middle branches of the Sulphur River.

Special Study sampling is designed to address a specific concern or to provide additional data necessary to complete existing information. No special study monitoring is currently being done by SRBA within the basin.



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