



# Trinity River Authority Clean Rivers Program 2014 Basin Highlights Report



## Watershed Characterizations for the Elm Fork, East Fork, Cedar Creek, and Richland-Chambers Subwatersheds

### INTRODUCTION

The Texas Clean Rivers Program (CRP) was created in 1991 by Texas Senate Bill 818 and is administered by the Texas Commission on Environmental Quality (TCEQ) which contracts with local planning agencies to conduct the program in each river basin. The program is tasked with protecting the water resources of the state and improving water quality. In the Trinity River basin, the TRA Clean Rivers Program focuses on water quality monitoring, special projects, and public outreach to achieve the goals of the program. More information about the TRA CRP and activities can be found at <http://www.trinityra.org/clean-rivers-program.htm>.

Data collected by the TRA CRP are used for regulatory purposes, such as setting water quality standards, modeling for permit limits, and for water quality assessments. Every two years, TCEQ conducts an assessment of water quality throughout the state and issues a Water Quality Integrated Report; which identifies impairments and concerns for designated uses. These designated uses include Aquatic Life Use, Contact Recreation, General Use, Fish Consumption, and Public Water Supply Use. The 2012 Texas Water Quality Integrated Report was used in the development of this report.

### TRINITY RIVER BASIN

The Trinity River basin covers approximately 18,000 square miles. As discussed in the 2012 Basin Highlights Report, the northern portion of the Trinity River Basin is influenced by the features found in this area—namely the Blackland Prairie and the Dallas-Fort Worth Metroplex (DFW). In contrast, a large portion of the subwatersheds discussed in this report are rural with small areas of urbanization throughout the watersheds.

Over the past year, many of the water bodies in these subwatersheds have experienced ongoing drought conditions with the reservoirs falling below conservation pool elevation and the streams going dry or having very low flows. Much of the



land use in these subwatersheds consists of row crop agriculture and rangeland. Fertilizers used on crops and fields may contribute to the nutrient concerns seen throughout these water bodies.

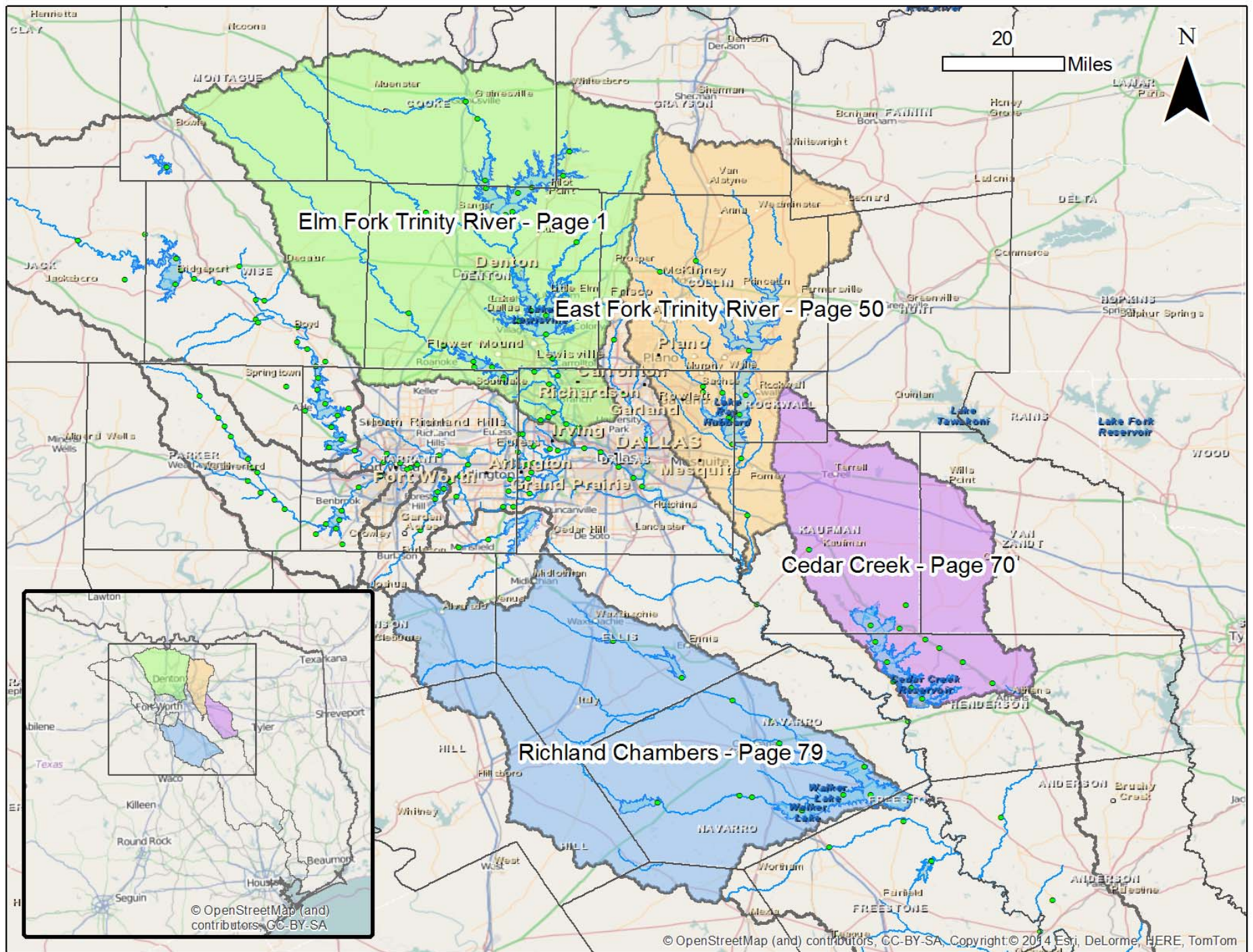
Many of the reservoirs in these subwatersheds have been classified as eutrophic to hypereutrophic based on the “Trophic Classification of Texas Reservoir” report by TCEQ ([http://www.tceq.state.tx.us/assets/public/compliance/monops/water/04twqi/04\\_reservoir\\_narrative.pdf](http://www.tceq.state.tx.us/assets/public/compliance/monops/water/04twqi/04_reservoir_narrative.pdf)). This report states that reservoirs become more eutrophic as they age due to a buildup of nutrients within the reservoir, which is the likely cause for Chlorophyll-a issues in these reservoirs.

### BASIN HIGHLIGHTS REPORT

This report is intended to characterize the watersheds of the Trinity River basin. Features such as land use, soil and vegetation types, and watershed activities are reviewed. Potential sources of impairments and concerns based on the 2012 Texas Water Quality Integrated Report are identified and recommendations to improve water quality are suggested when known.

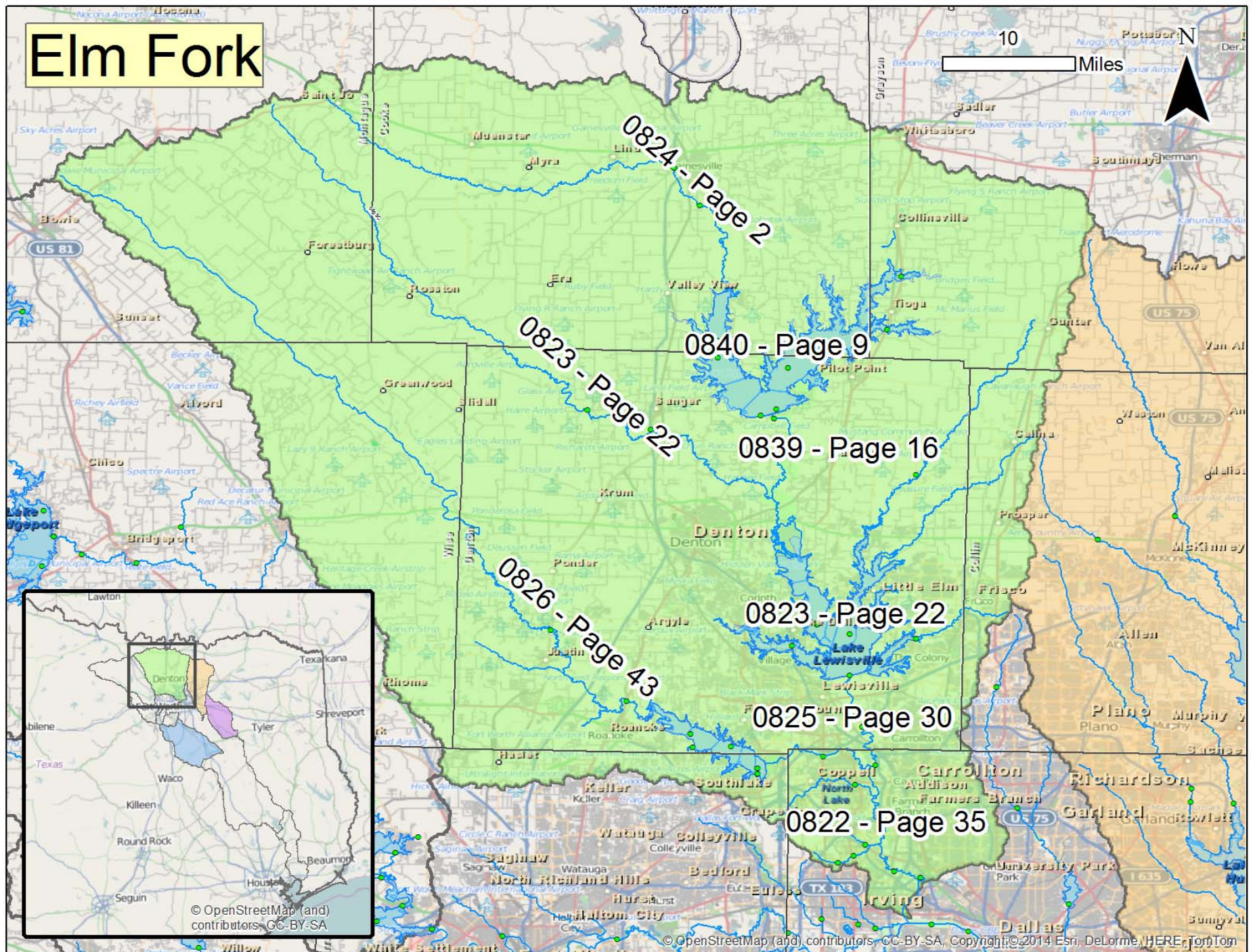
This report focuses on the Elm Fork and East Fork Trinity River as well as the Cedar Creek and Richland-Chambers subwatersheds. The 2012 Basin Highlights Report covered the Main Stem Trinity River and the Trinity River below Lake Livingston. The 2013 Basin Highlights Report covered the West and Clear Forks and Village and Mountain Creek subwatersheds. This report concludes the watershed characterizations of the basin with the Elm Fork and East Fork Trinity River and the Cedar Creek and Richland-Chambers subwatersheds. Site numbers listed in the text of this report are defined in the Site Glossary at the end of this document. In addition, the sites assigned to each assessment unit are as defined by the 2012 Texas Water Quality Integrated Report and may change slightly in future water quality integrated reports.







# Elm Fork





# Elm Fork Subwatershed

## **0824 – Elm Fork Trinity River Above Ray Roberts Lake**

### **SEGMENT DESCRIPTION**

Segment 0824 begins at a point 9.5 km (5.9 miles) downstream of the confluence of Pecan Creek in Cooke County and continues up to US 82 in Montague County. There are five assessment units in this segment. 0824\_01 is the lower 7.5 miles of the segment. Sites in this assessment unit include 11029 and 11031. 0824\_02 is a two mile reach near an unmarked county road 1.4 km downstream of the Gainesville wastewater treatment plant. Sites in this assessment unit include 11033. 0824\_03 is a 3.5 mile reach near SH 51. Sites in this assessment unit include 15635 and 17670. 0824\_04 is a 25 mile reach near FM 3108. Sites in this assessment unit include 16432. 0824\_05 is the upper 48 miles of segment.

Figure 0824.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs). Table 0824.1 lists the stations being monitored in fiscal year 2014 as well as the parameters being collected and the frequency of sampling.

### **HYDROLOGIC CHARACTERISTICS**

The median annual average discharge in this segment is 97.0 cubic feet per second (cfs) based on historic values at the USGS flow gage near Gainesville (08050400). The outfalls of the cities on Saint Jo, Muenster, and Lindsay contribute to the streamflow at this gage. The City of Gainesville outfall meets this segment downstream of the mentioned USGS gage. Over the past year, post-rainfall flows have returned to normal in less than a week for short duration rain events. Large magnitude peak flows caused by multiple rain events over several days have generally returned to normal within two weeks.

### **IMPAIRMENT/AREA OF INTEREST DESCRIPTION**

Based on the 2012 Texas Water Quality Integrated Report, there are impairments in assessment units 0824\_01, 0824\_02, and 0824\_03. Details of the assessment are located in Table 0824.2.

### **LAND USE AND NATURAL CHARACTERISTICS**

This watershed is mainly rural with cropland and pastures dominating the land use. There is a smaller band of rangeland dotted with areas of forest seen on the western and very southeastern ends of the watershed. The main watershed drainage is located almost totally within the Grand Prairie. A few of the tributaries drain part of the Eastern Cross Timbers in the lower part of the watershed. See Figures 0824.2 to 0812.4 for land covers, soil regions, and vegetative provinces in this watershed. See Figure 0824.1 for three small dischargers in this area, plus the discharge from the largest town along this segment: the City of Gainesville. There are also several landfills in close proximity to the segment, seen in Figure 0824.1.

### **POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST**

Low DO values reported in AU 3 may be related to typical low flows found in this segment. Nutrients and chlorophyll a values throughout the reach may be related to the contributions of small wastewater treatment plants in the segment as well as the runoff from fertilizers used in row crop agriculture throughout the segment.

### **POTENTIAL STAKEHOLDERS**

City of St Jo  
City of Muenster  
City of Lindsay  
City of Gainesville  
City of Dallas

### **RECOMMENDATIONS FOR IMPROVING WATER QUALITY**

Landowner education on water quality could assist in preventing runoff of chemicals from farming and landscaping. Limiting the use of pre-emergent herbicides and fertilizers or opting for safer alternatives may reduce the harm of runoff into the stream from the cropland and rangeland found in this area.

### **ONGOING PROJECTS**

There are no ongoing projects in this segment.

### **MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)**

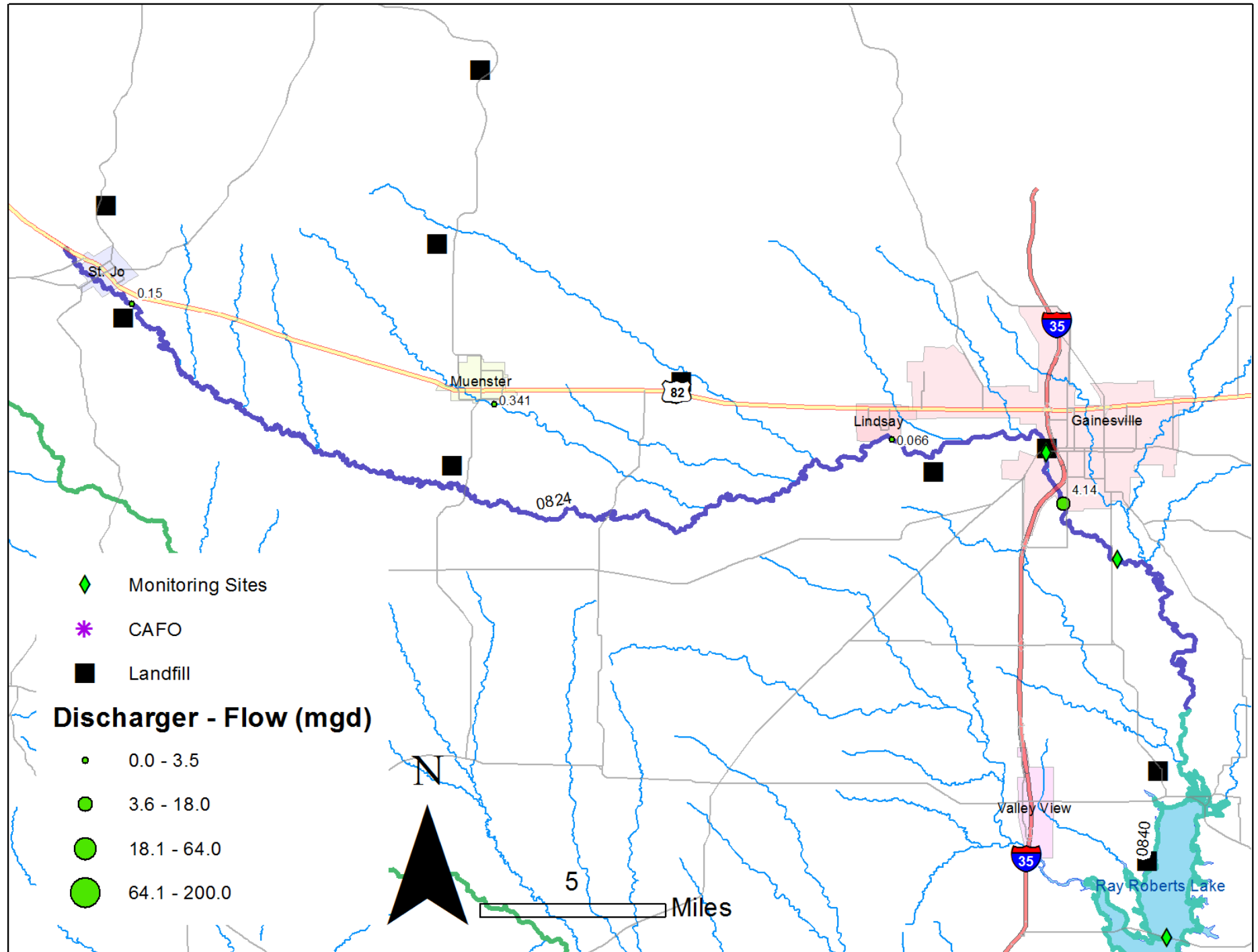
There are no known or anticipated events that would affect water quality in this segment. There are several small dischargers in this segment; one of which renewed their water quality permit in 2012. See Table 0824.3 for details.

### **IMAGES**

See Figures 0824.5 to 0824.8 for images of this segment.



FIGURE 0824.1





**TABLE 0824.1: Fiscal Year 2014 Monitoring**

Monitoring Entity	Segment	AU	Site ID	Site Description	Monitoring Type	24 Hour DO	Metals Water	Conventional	Bacteria	Flow	Field
Dallas	0824	0824_01	11031	ELM FORK TRINITY RIVER IMMEDIATELY DOWNSTREAM OF FM 2071 SOUTH OF GAINESVILLE (R1)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)



**TABLE 0824.2: 2012 Water Quality Integrated Report**

Segment and Assessment Unit	Use	Method	Parameter Description	Criteria	Number of samples assessed	Number of samples exceed criteria	Mean of samples assessed (avg or geometric mean)	Mean of samples that exceed criteria	Dataset Qualifier	Impairment Level	Impairment Category
0824_01	General Use	Nutrient Screening Levels	Nitrate						ID	CS*	
0824_01	General Use	Nutrient Screening Levels	Orthophosphorus	0.37	5	3		1.18	LD	CS*	
0824_01	General Use	Nutrient Screening Levels	Total Phosphorus						ID	CS*	
0824_01	General Use	Nutrient Screening Levels	Chlorophyll-a						ID	CS*	
0824_02	General Use	Nutrient Screening Levels	Nitrate						ID	CS*	
0824_02	General Use	Nutrient Screening Levels	Orthophosphorus	0.37	4	3		1.33	LD	CS*	
0824_03	Aquatic Life Use	Dissolved Oxygen grab screening level	Dissolved Oxygen Grab	5	29	5		4.12	AD	CS	
0824_03	General Use	Nutrient Screening Levels	Chlorophyll-a	14.1	26	13		28.38	AD	CS	

Dataset Qualifier Codes

AD-Adequate Data (10 or more samples)

ID-Inadequate data (less than 4 samples)

LD-Limited Data (between 4 and 9 samples)

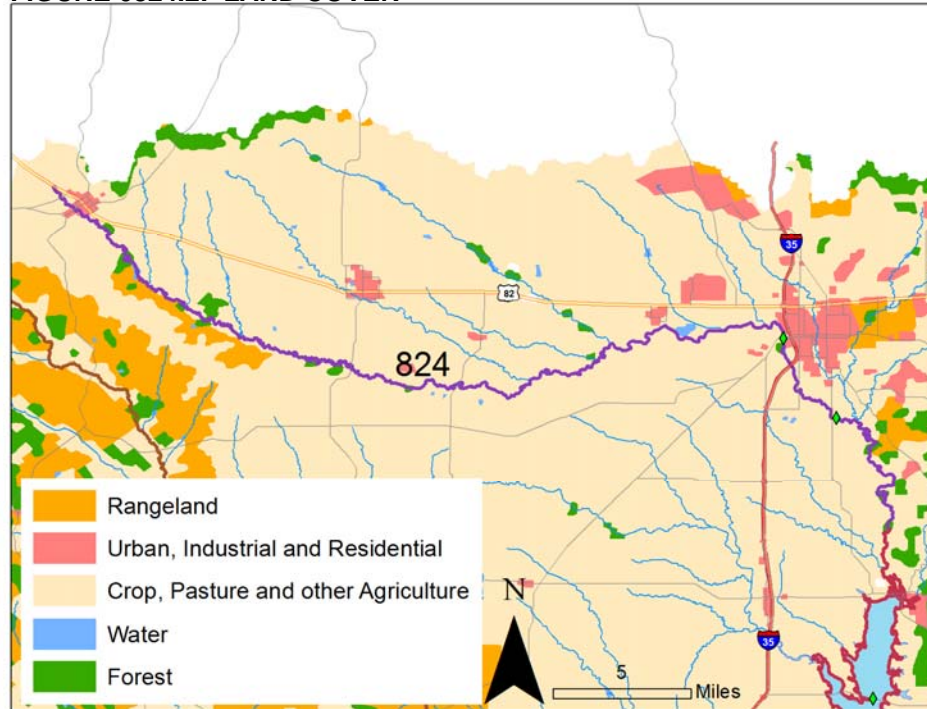
Impairment Level

CS-Screening level concern

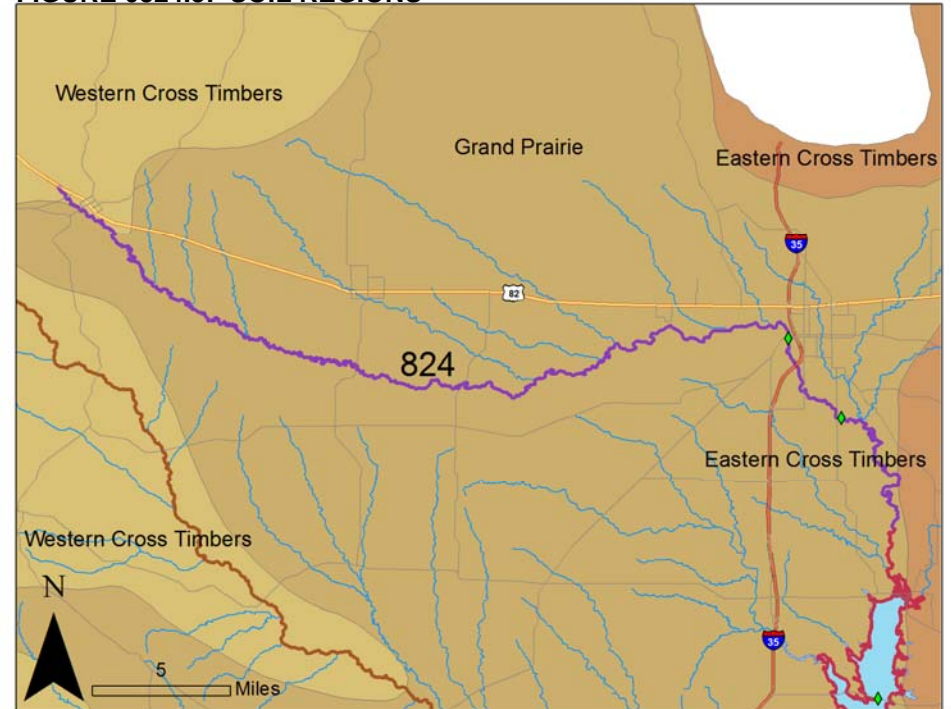
CS\*-Screening level concern carried forward from previous assessments



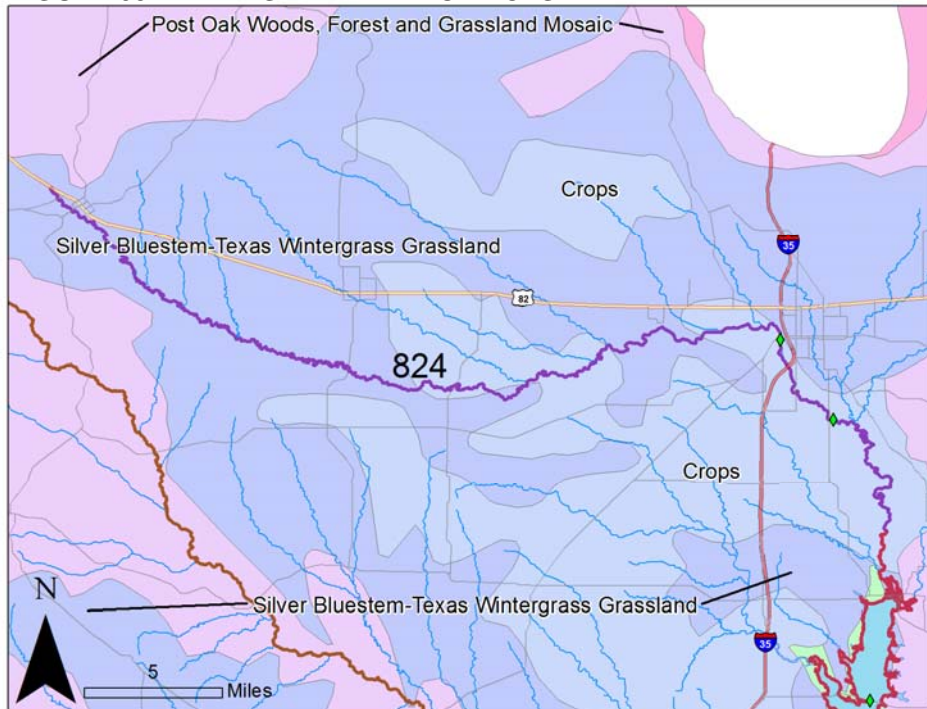
**FIGURE 0824.2: LAND COVER**



**FIGURE 0824.3: SOIL REGIONS**



**FIGURE 0824.4: VEGETATIVE PROVINCES**



**TABLE 0824.3: New and Renewed Discharge Permits**

Segment	Notice received by TRA on	Permitee/Facility	County	Permit Type	Action	Status	Permit Number
824	3/16/2012	LINDSAY, TOWN - STP	Cooke	Water Quality	Renew al	Final	10923-001



**FIGURE 0824.5:**



**FIGURE 0824.6:**



**FIGURE 0824.7:**



**FIGURE 0824.8:**



# Elm Fork Subwatershed

## 0840 – Ray Roberts Lake

### SEGMENT DESCRIPTION

Segment 0840 begins at Ray Roberts Dam in Denton County and continues up to a point 9.5 km (5.9 miles) upstream of the confluence of Pecan Creek in Cooke County. It impounds the Elm Fork Trinity River up to the normal pool elevation of 632.5 feet. There are eight assessment units in this segment. 0840\_01 is the lowermost portion of reservoir adjacent to dam. Sites in this assessment unit include 14039 and 17834. 0840\_02 is the lower portion of Jordan Creek arm west of Pilot Point. Sites in this assessment unit include 11076. 0840\_03 is the upper portion of Jordan Creek arm. Sites in this assessment unit include 16823. 0840\_04 is Buck Creek cove. Sites in this assessment unit include 16822. 0840\_05 is the lower portion of the Elm Fork arm. 0840\_06 is the middle portion of the Elm Fork arm. 0840\_07 is the upper portion of the Elm Fork arm. Sites in this assessment unit include 16824. 0840\_08 is the remainder of reservoir. Sites in this assessment unit include 20897 and 20899.

Unclassified water bodies in this segment include those listed below.

0840A—Unnamed tributary of Jordan Creek—From the confluence with Jordan Creek south of CR 226 to the headwaters near South Neathery Street in Collinsville in Grayson County.

Figure 0840.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs). Table 0840.1 lists the stations being monitored in fiscal year 2014 as well as the parameters being collected and the frequency of sampling.

### HYDROLOGIC CHARACTERISTICS

Some hydrologic characteristics of this segment can be assessed based on historic values from the USGS flow gage at Greenbelt near Pilot Point (08051135 in Segment 0839), which is the first gage downstream of the Lake Ray Roberts dam release. Over the past year, the median annual average flow at this gage is 656 cubic feet per second (cfs) based on historic values from the USGS flow gage. Further investigation reveals, however, that the variable Lake release rates cause median monthly flow values to fluctuate from as low as 42.9cfs in a Summer month to 1367.7 during a heavily precipitated month in 2013. After large rain events the Lake release generally lowers and stabilizes within approximately 30 to 45 days.

Ray Roberts Lake has a conservation pool elevation of 632.5 feet and is fed by the Elm Fork Trinity River. This reservoir is used for flood control, water supply, and recreational activities. At the time of this writing, the reservoir has been below the conservation pool elevation by up to 7.8 feet since April 27, 2012.

### IMPAIRMENT/AREA OF INTEREST DESCRIPTION

Based on the 2012 Texas Water Quality Integrated Report, there are impairments in

assessment units 0840\_01, 0840\_02, 0840\_03, 0840\_04, and 0840\_08. Details of the assessment are located in Table 0840.2.

### LAND USE AND NATURAL CHARACTERISTICS

Land use in this watershed is nearly all classified as agriculture and/or pasture, with some forest class lands to the north and south of central 0840. The eastern portion of the watershed is in the Eastern Cross Timbers ecoregion and the western portion is in the Grand Prairie ecoregion.

### POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST

The TCEQ report titled Trophic Classification of Texas Reservoirs classified Ray Roberts Lake as being eutrophic, which notes that reservoirs become more eutrophic as they age due to the buildup of nutrients in the reservoir.

### POTENTIAL STAKEHOLDERS

Surrounding Cities such as Tioga, Collinsville, Pilot Point, Sanger, Denton and Dallas/Ft Worth.

Park authorities

University of North Texas

### RECOMMENDATIONS FOR IMPROVING WATER QUALITY

With common issues inherent to a eutrophic lake, any measure which limits nutrient-heavy inflows/runoff to the lake should be explored. Landowner education on water quality could assist in preventing runoff of chemicals from farming and landscaping. Limiting the use of pre-emergent herbicides and fertilizers or opting for safer alternatives may reduce the harm of runoff into the stream from the cropland and rangeland found in this area.

### ONGOING PROJECTS

There are no ongoing projects in this segment.

### MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)

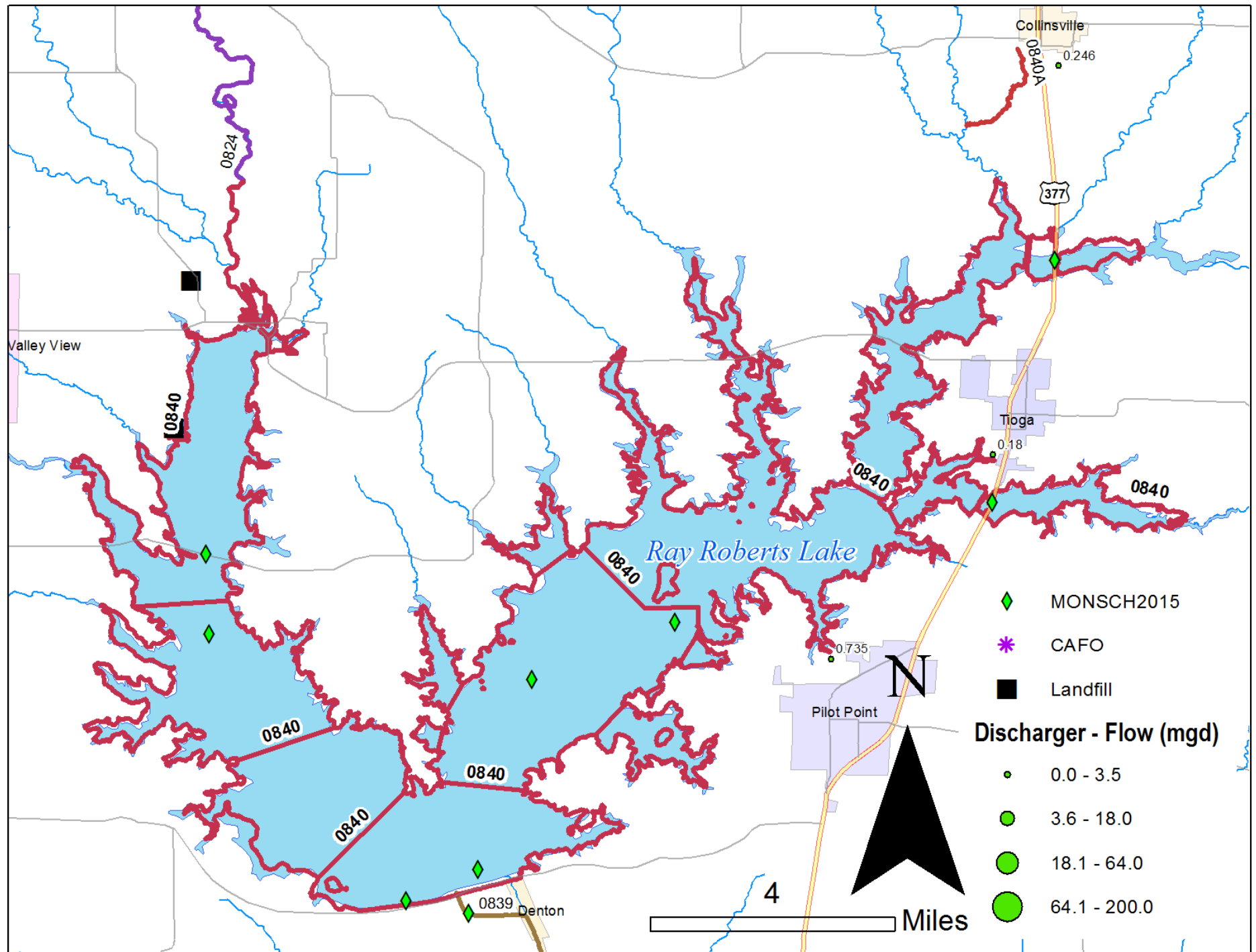
Zebra mussels were found in this reservoir in 2012. Due to their ability to reproduce quickly and filter large amounts of water, zebra mussels can dramatically change the food web of a reservoir. In addition, they selectively reject blue-green algae which can lead to blooms of these algae which are associated with taste and odor problems in finished drinking water. Two dischargers renewed their water quality permits in 2012. See Table 0840.3 for details.

### IMAGES

See Figures 0840.5 to 0840.8 for images of this segment.



FIGURE 0840.1



**TABLE 0840.1: Fiscal Year 2014 Monitoring**

Monitoring Entity	Segment	AU	Site ID	Site Description	Monitoring Type	24 Hour DO	Metals Water	Conventional	Bacteria	Flow	Field
Dallas	0840	0840_01	17834	RAY ROBERTS LAKE AT DALLAS WATER UTILITIES INTAKE W SIDE OF DAM 1.02 KM N AND 232 METERS E OF INTERSECTION OF BURGER RD AND FM 2153 (R6)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0840	0840_02	11076	RAY ROBERTS LAKE ISLE DU BOIS CREEK ARM WEST OF JORDAN PARK 2.84 KM N AND 599 M W OF INTERSECTION OF ISLE DU BOIS PARK RD AND QUAIL RUN (R5)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0840	0840_03	16823	RAY ROBERTS LAKE IN RANGE CREEK COVE AT US 377 BRIDGE 600 M SOUTH AND 57 M WEST OF INTERSECTION OF PATTON RD AND US 377 SW OF SHERMAN (R2)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0840	0840_04	16822	RAY ROBERTS LAKE BUCK CREEK COVE AT US377 BRIDGE 1.06 KM N AND 428 M E OF INTERSECTION OF US 377 AND EMBERSON CHAPEL RD SW OF SHERMAN (R3)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0840	0840_07	16824	RAY ROBERTS LAKE AT FM 3002 377 METERS NORTH AND 1.25 KM EAST OF INTERSECTION OF FM 3002 AND MANN ROAD 13 MI SOUTH OF GAINESVILLE (R4)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)



**TABLE 0840.2: 2012 Water Quality Integrated Report**

Segment and Assessment Unit	Use	Method	Parameter Description	Criteria	Number of samples assessed	Number of samples exceed criteria	Mean of samples assessed (avg or geomean)	Mean of samples that exceed criteria	Dataset Qualifier	Impairment Level	Impairment Category
0840_01	General Use	Nutrient Screening Levels	Nitrate	0.37	3	0			ID	CS	
0840_02	General Use	Nutrient Screening Levels	Nitrate						ID	CS*	
0840_03	General Use	Nutrient Screening Levels	Nitrate						ID	CS*	
0840_03	General Use	Nutrient Screening Levels	Orthophosphorus						ID	CS*	
0840_03	General Use	Nutrient Screening Levels	Ammonia						ID	CS*	
0840_03	General Use	Nutrient Screening Levels	Total Phosphorus						ID	CS*	
0840_04	General Use	Nutrient Screening Levels	Ammonia						ID	CS*	
0840_04	General Use	Nutrient Screening Levels	Nitrate						ID	CS*	
0840_08	Aquatic Life Use	Dissolved Oxygen grab screening level	Dissolved Oxygen Grab	5	20	10		4.41	AD	CS	

Dataset Qualifier Codes

AD-Adequate Data (10 or more samples)

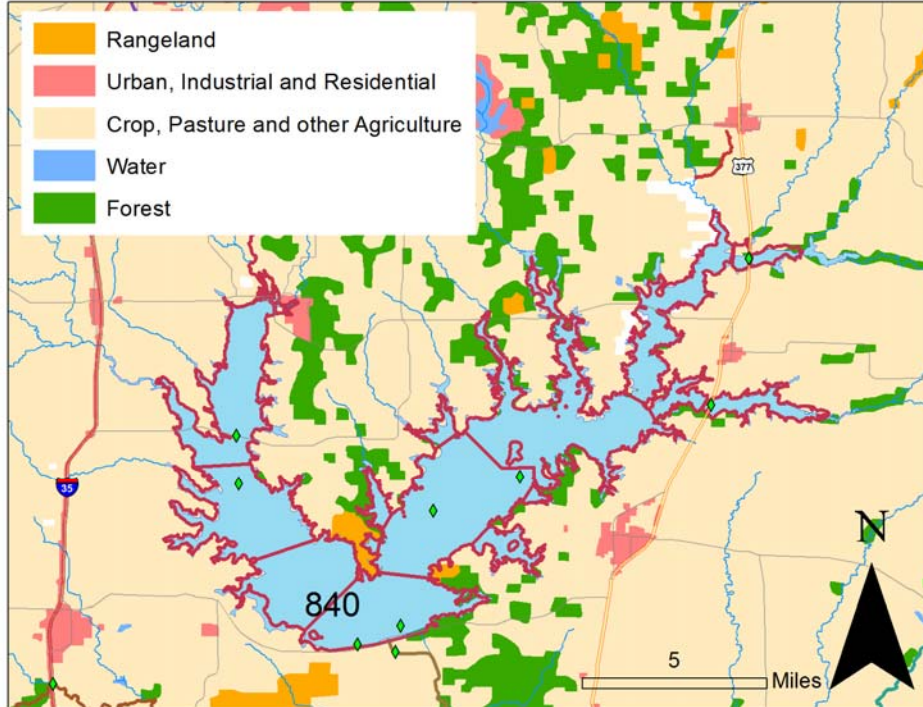
ID-Inadequate data (less than 4 samples)

Impairment Level

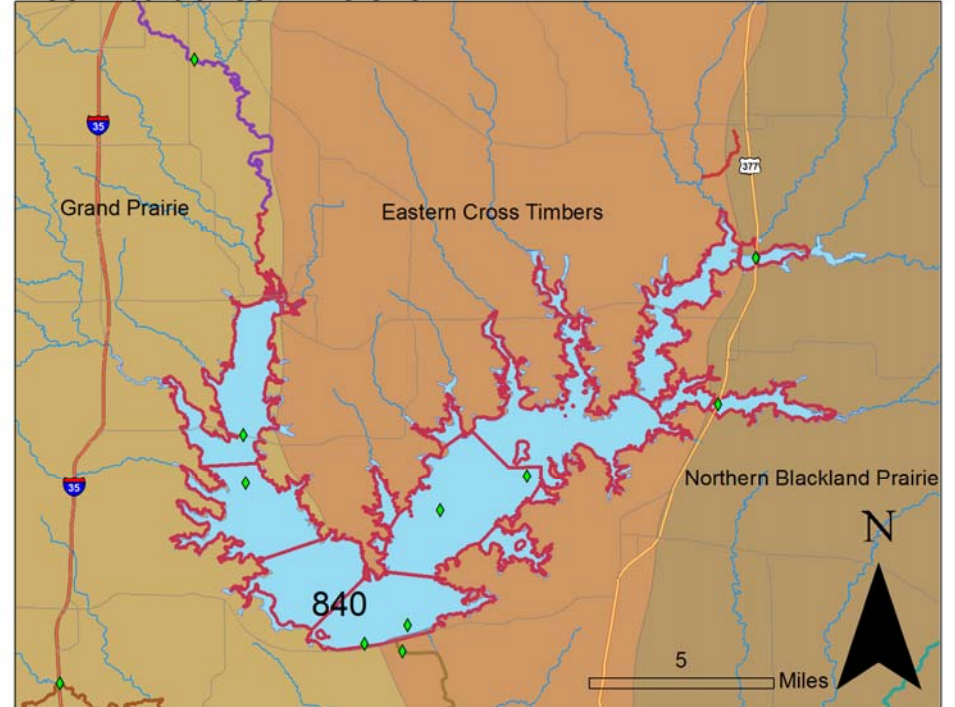
CS-Screening level concern

CS\*-Screening level concern carried forward from previous assessments

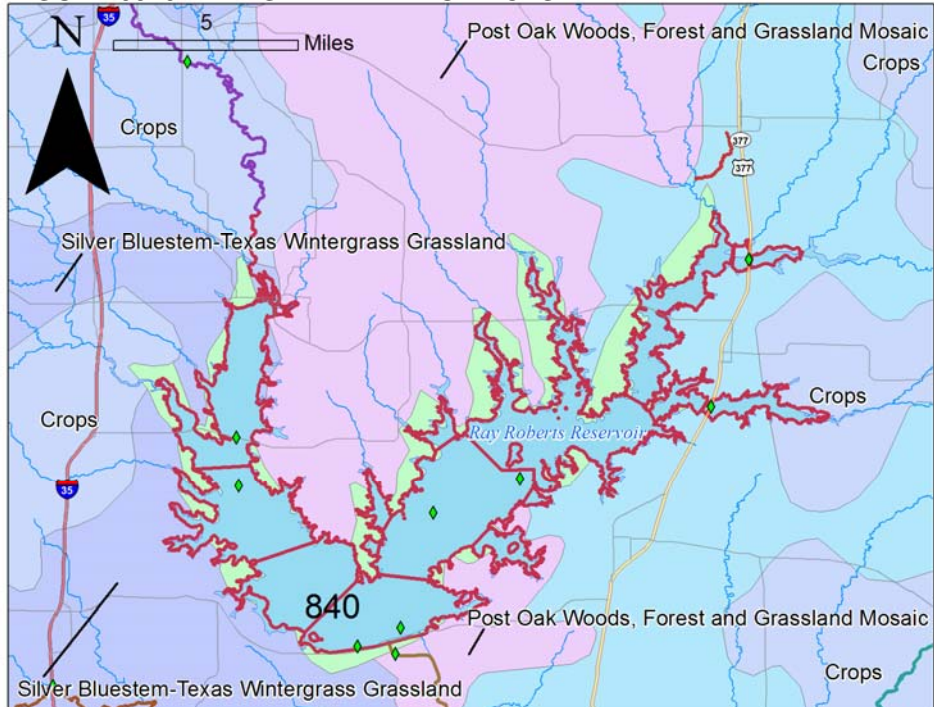
**FIGURE 0840.2: LAND COVER**



**FIGURE 0840.3: SOIL REGIONS**



**FIGURE 0840.4: VEGETATIVE PROVINCES**





**TABLE 0840.3: New and Renewed Discharge Permits**

Segment	Notice received by TRA on	Permitee/Facility	County	Permit Type	Action	Status	Permit Number
840	2/17/2012	VALLEY VIEW, CITY - STP	Cooke	Water Quality	Renew al	Final	14892-001
840	1/9/2012	PILOT POINT, CITY - STP	Denton	Water Quality	Renew al	Final	10361-001

FIGURE 0840.5:



FIGURE 0840.6:



FIGURE 0840.7:



FIGURE 0840.8:



# Elm Fork Subwatershed

## **0839 – Elm Fork Trinity River Below Ray Roberts Lake**

### **SEGMENT DESCRIPTION**

Segment 0839 begins a point 100 meters (110 yards) upstream of US 380 in Denton County and continues up to Ray Roberts Dam in Denton County. There is one assessment unit in this segment, 0839\_01, that covers the entire segment. Sites in this assessment unit include 13619.

Unclassified water bodies in this segment include those listed below.

0839A—Clear Creek—A 25 mile stretch of Clear Creek running upstream from the confluence with the Elm Fork Trinity River and continuing up to FM 455 just west of Bolivar in Denton County. This segment includes sites 10859 and 13618.

Figure 0839.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs). Table 0839.1 lists the stations being monitored in fiscal year 2014 as well as the parameters being collected and the frequency of sampling.

### **HYDROLOGIC CHARACTERISTICS**

This section of the Elm Fork is mainly fed by Lake Ray Roberts dam release. Over the past year, the median annual average flow in this segment is 656 cubic feet per second (cfs) based on historic values from the USGS flow gage at Greenbelt near Pilot Point (08051135). Further investigation reveals, however, that the variable Lake release rates cause median monthly flow values to fluctuate from as low as 42.9cfs in a Summer month to 1367.7 during a heavily precipitated month in 2013. After large rain events the Lake release generally lowers and stabilizes within approximately 30 to 45 days.

### **IMPAIRMENT/AREA OF INTEREST DESCRIPTION**

There are no impairments or concerns in this segment.

### **LAND USE AND NATURAL CHARACTERISTICS**

Segment 0839 is essentially the boundary line between the Grand Prairie and Eastern Cross Timbers ecoregions. Land use in the watershed is generally classified as agriculture/pasture with large sections of rangeland to the south and the City of Denton to the west/southwest. The 'Greenbelt' natural recreation area is located along a part of this reach.

### **POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST**

There are no impairments or concerns in this segment.

### **POTENTIAL STAKEHOLDERS**

City of Denton  
City of Dallas

City of Fort Worth  
University of North Texas

### **RECOMMENDATIONS FOR IMPROVING WATER QUALITY**

There are no impairments or concerns in this segment.

### **ONGOING PROJECTS**

There are no ongoing projects in this segment.

### **MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)**

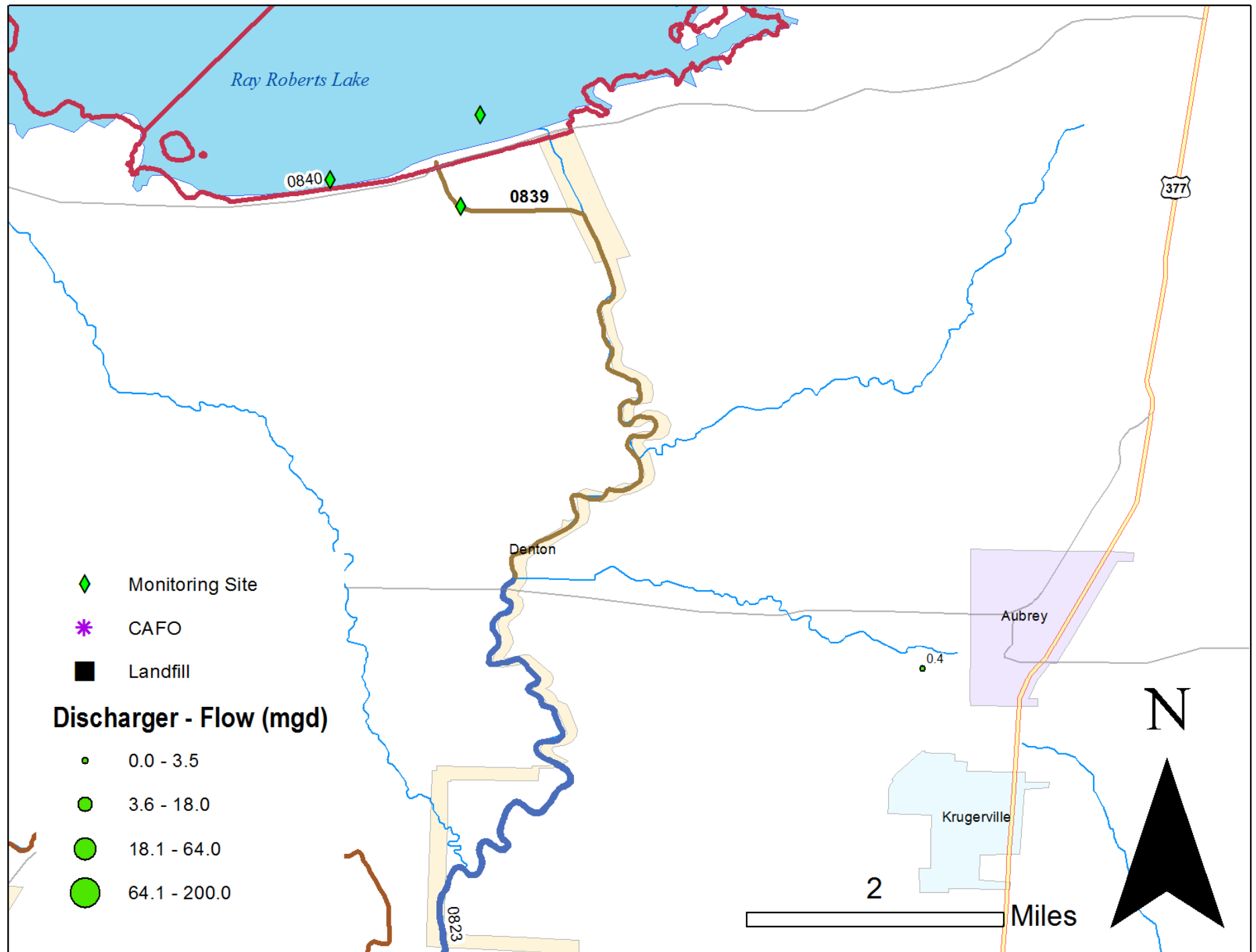
There are no known or anticipated events that would affect water quality in this segment. Being a very small segment and downstream of Ray Roberts Lake, this segment is dominated by releases from the dam. Therefore, it can be expected that issues impacting Ray Roberts Lake would also affect this segment. One discharger renewed their water quality permit in 2012. See Table 0839.2 for details.

### **IMAGES**

See Figures 0839.5 to 0839.8 for images of this segment.



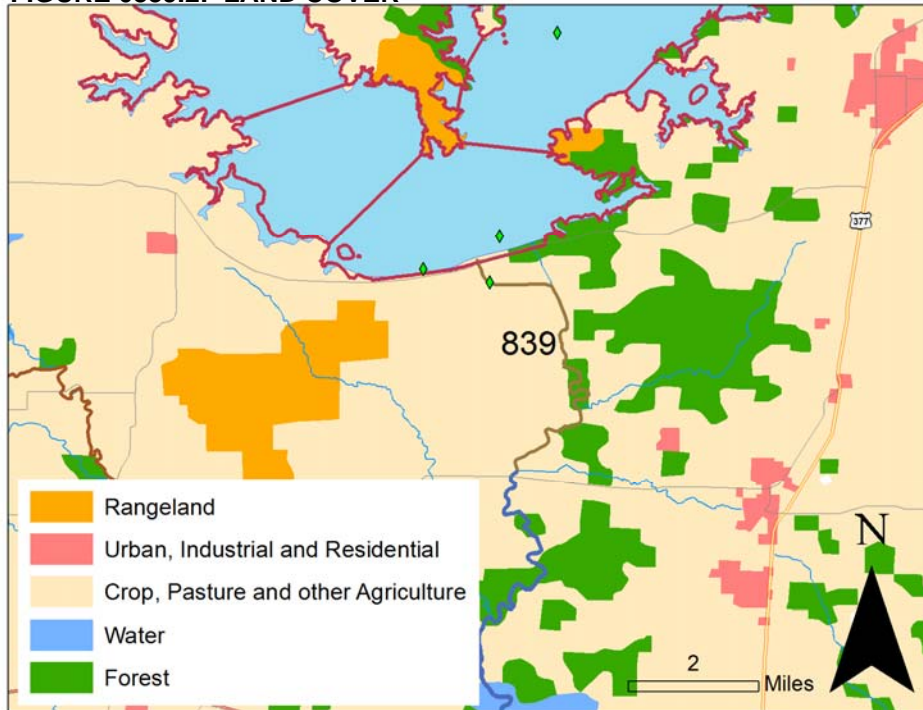
FIGURE 0839.1



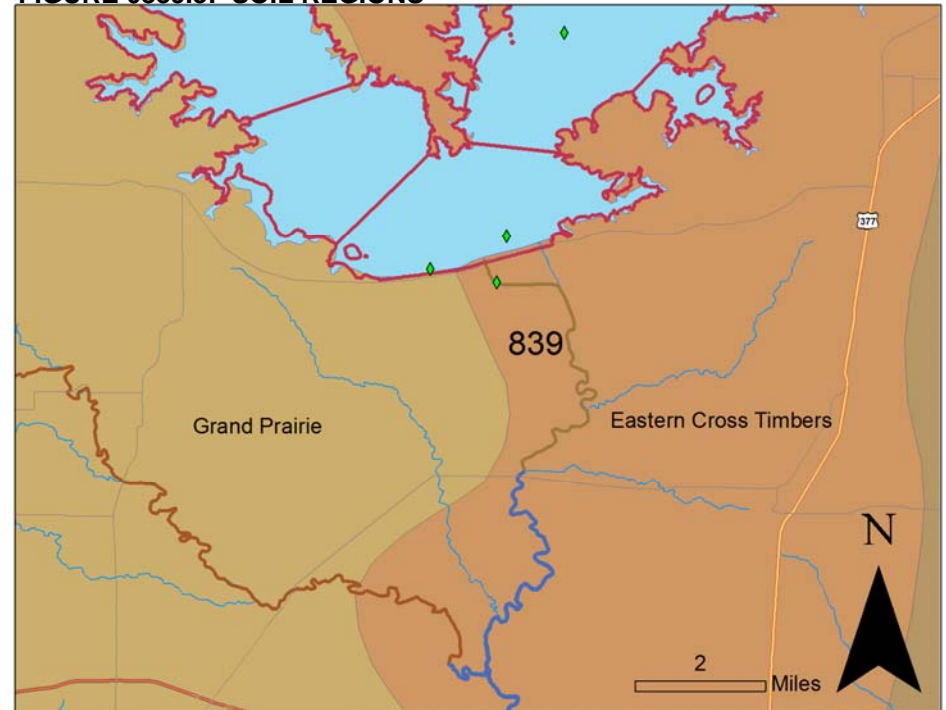
**TABLE 0839.1: Fiscal Year 2014 Monitoring**

Monitoring Entity	Segment	AU	Site ID	Site Description	Monitoring Type	24 Hour DO	Metals Water	Conventional	Bacteria	Flow	Field
Dallas	0839	0839_01	13619	ELM FORK TRINITY RIVER 336 METERS DOWNSTREAM OF RAY ROBERTS DAM 5.7 MI SW OF PILOT POINT 3.3 MI UPSTREAM FROM BRAY BRANCH (L2)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)

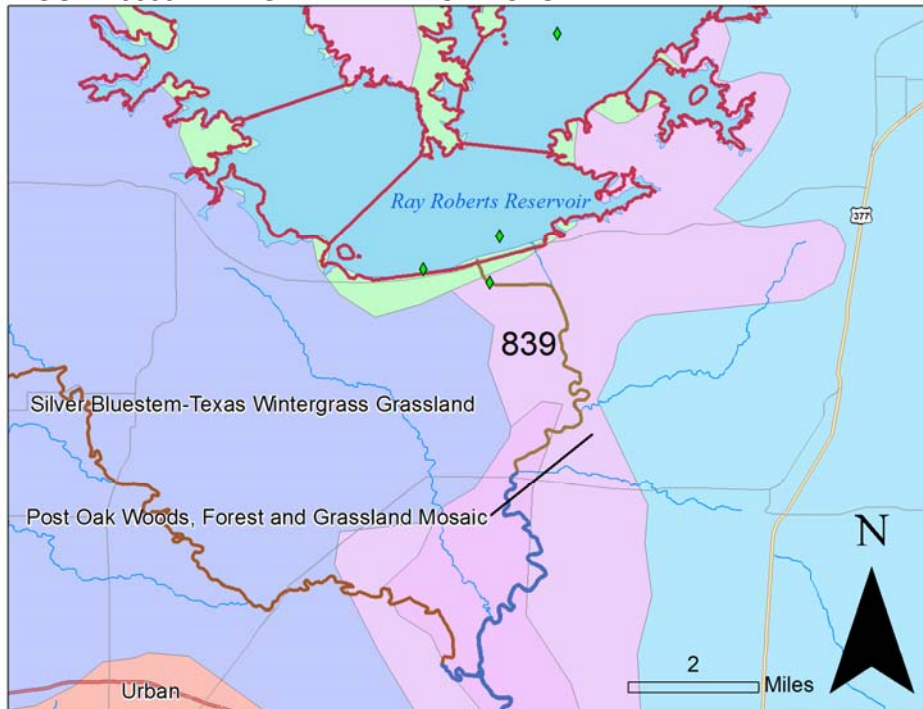
**FIGURE 0839.2: LAND COVER**



**FIGURE 0839.3: SOIL REGIONS**



**FIGURE 0839.4: VEGETATIVE PROVINCES**





**TABLE 0839.2: New and Renewed Discharge Permits**

Segment	Notice received by TRA on	Permittee/Facility	County	Permit Type	Action	Status	Permit Number
839	3/29/2012	DENTON, CITY - CLEAR CR STP	Denton	Water Quality	Renew al	Final	14416-001

**FIGURE 0839.5:**



**FIGURE 0839.6:**



**FIGURE 0839.7:**



**FIGURE 0839.8:**



# Elm Fork Subwatershed

## 0823 – Lewisville Lake

### SEGMENT DESCRIPTION

Segment 0823 begins at Lewisville Dam in Denton County and continues up to a point 100 meters (110 yards) upstream of US 380 in Denton County. It impounds the Elm Fork Trinity River up to the normal pool elevation of 515 feet. There are six assessment units in this segment. 0823\_01 is the lowermost portion of reservoir. Sites in this assessment unit include 11025, 13995, and 13996. 0823\_02 is Stewart Creek arm. Sites in this assessment unit include 13997 and 16808. 0823\_03 is Hickory Creek arm. Sites in this assessment unit include 11027, 13998, 18476, 18477, 18478, 18479, 20893, and 18475. 0823\_04 is Little Elm Creek arm. Sites in this assessment unit include 17830. 0823\_05 is the middle portion of reservoir east of Lake Dallas. Sites in this assessment unit include 13999, 14001, and 11026. 0823\_06 is the remainder of reservoir. Sites in this assessment unit include 18481 and 18480.

Unclassified water bodies in this segment include those listed below.

0823A—Little Elm Creek—From the confluence with Lake Lewisville in Denton County up to 1.4 km above FM 453 in Collin County. There are two assessment units in this segment. 0823A\_01 is the lower 12 miles of the segment from the confluence with Lake Lewisville in Denton County up to FM 455 in Collin County. Sites in this assessment unit include 13617 and 16826. 0823A\_02 is the upper 15 miles of the segment from FM 455 in Collin County up to 1.4 km above FM 121 in Grayson County near Guenther.

0823B—Stewart Creek—From the confluence with Lake Lewisville in Denton County up to the headwaters near Frisco in Collin County. This segment includes site 10860.

0823C—Clear Creek—From the confluence with Lake Lewisville in Denton County up to the headwaters west of Montague in Montague County. There are two assessment units in this segment. 0823C\_01 is the lower 25 miles of segment. Sites in this assessment unit include 16827. 0823C\_02 is the upper 40 miles of segment.

0823D—Doe Branch—From the confluence with Lake Lewisville/Elm Fork Trinity River in Denton County up to the headwaters northeast of Celina in Collin County. There is one assessment unit in this segment. 0823D\_01 is from the confluence with Lake Lewisville/Elm Fork Trinity River in Denton County up to the headwaters northeast of Celina in Collin County. This segment includes sites 18560 and 20291.

Figure 0823.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs). Table 0823.1 lists the stations being monitored in fiscal year 2014 as well as the parameters being collected and the frequency of sampling.

### HYDROLOGIC CHARACTERISTICS

Lewisville Lake has a conservation pool elevation of 522 feet and is fed by the Elm Fork Trinity River. This reservoir is used for flood control, water supply, and recreational activities. At the time of this writing, the reservoir has been below the conservation pool elevation by up to 8.92 feet since April 27, 2012.

### IMPAIRMENT/AREA OF INTEREST DESCRIPTION

Based on the 2012 Texas Water Quality Integrated Report, there are impairments in assessment units 0823\_02, 0823\_04, 0823A\_01, 0823B\_01, and 0823D\_01. Details of the assessment are located in Table 0823.2.

### LAND USE AND NATURAL CHARACTERISTICS

Land use to the east of the watershed is generally classified as agriculture/pasture and urban or rangeland to the west. Moving from northwest to southeast, the watershed covers portions of the Grand Prairie, Eastern Cross Timbers, and Blackland Prairie ecoregions respectively. Over the last 25 years, the Lake Lewisville watershed has seen tremendous urbanization.

### POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST

It is probable that the nutrient concerns in segments 0823, 0823B and 823D are the result of a combination of factors present in these reaches, including wastewater treatment plant inflows, runoff from nearby cropland and concentrated animal feedlots, and the runoff from fertilized landscape in the urban areas dotting the region. Dissolved Oxygen issues in 0823A may be attributed to the low flows typical of an area which is upstream in the watershed, as 0823A is. The E. coli concern reported in 0823D could be due to two CAFOs near this part of the segment.

### POTENTIAL STAKEHOLDERS

Cities of Lewisville, Dallas.

Nearby park authorities

Nearby lake recreation businesses/marinas

### RECOMMENDATIONS FOR IMPROVING WATER QUALITY

Education of safe urban and farm fertilization practices

Safe disposal of CAFO animal waste

### ONGOING PROJECTS

The Surface Water Quality Monitoring team of TCEQ is currently sampling for the Diurnal Dissolved Oxygen (DO) Dynamics in Selected Least Disturbed Streams project. Under this project, diurnal DO is monitored in reference streams in each ecoregion to determine the appropriateness of existing DO criteria.



# Elm Fork Subwatershed

## 0823 – Lewisville Lake (continued)

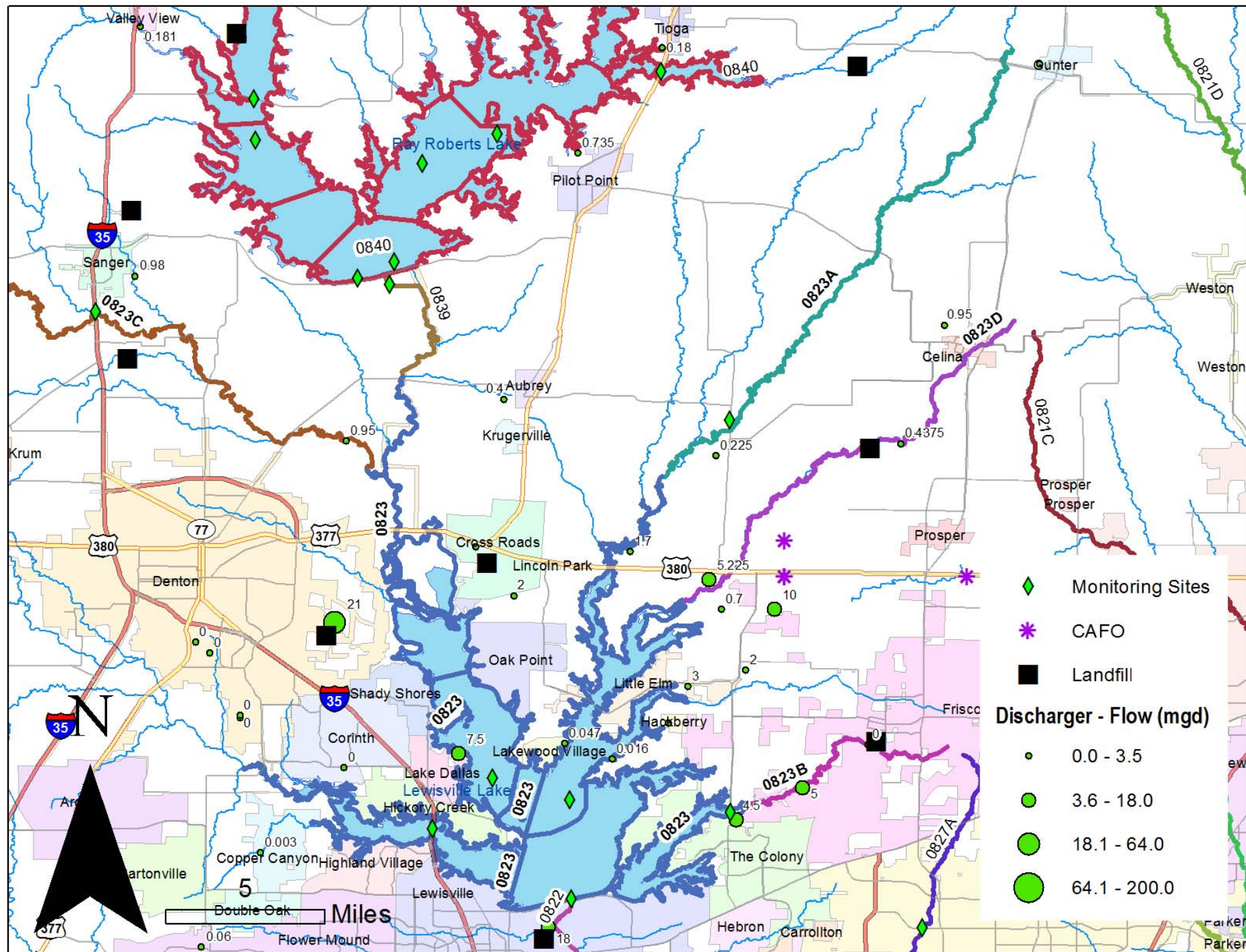
### **MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)**

Zebra mussels were found in this reservoir in 2012. Due to their ability to reproduce quickly and filter large amounts of water, zebra mussels can dramatically change the food web of a reservoir. In addition, they selectively reject blue-green algae which can lead to blooms of these algae which are associated with taste and odor problems in finished drinking water. Twelve dischargers renewed their water quality permits in 2012. In 2013, five dischargers renewed their water quality permits and one filed for an amendment. See Table 0823.3 for details.

### **IMAGES**

See Figures 0823.5 to 0823.8 for images of this segment.

FIGURE 0823.1



**TABLE 0823.1: Fiscal Year 2014 Monitoring**

Monitoring Entity	Segment	AU	Site ID	Site Description	Monitoring Type	24 Hour DO	Metals Water	Conventional	Bacteria	Flow	Field
Dallas	0823	0823_02	16808	LAKE LEWISVILLE IN STEWART CREEK ARM AT FM 423 BRIDGE 389 METERS NORTH OF INTERSECTION OF OVERLAKE DRIVE AND FM 423/MAIN STREET (L4)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0823	0823_03	11027	LEWISVILLE LAKE AT I 35E IN THE HICKORY CREEK ARM 681 METERS NORTH OF INTERSECTION OF I 35E AND COPPERAS BRANCH ROAD (L7)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0823	0823_04	11026	LEWISVILLE LAKE ELM FORK ARM 170 METERS NORTH AND 1.58 KM EAST OF INTERSECTION OF HUNDLEY AND MARINA DRIVE (L5)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0823	0823_04	17830	LEWISVILLE LAKE NEAR LITTLE ELM CREEK ARM 1.82 KM SOUTH AND 2.85 KM WEST OF INTERSECTION OF HIDDEN COVE AND HACKBERRY CREEK PARK (L6)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0823A	0823A_01	16826	LITTLE ELM CREEK AT UPPER BRANCH CROSSING OF FM 1385 APPROX 12 KM UPSTREAM OF LEWISVILLE LAKE (L3)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0823C	0823C_01	16827	CLEAR CREEK AT I 35 WEST OF US 377 APPROX 24.7 KM UPSTREAM OF LEWISVILLE LAKE SOUTH OF SANGER (L1)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)



**TABLE 0823.2: 2012 Water Quality Integrated Report**

Segment and Assessment Unit	Use	Method	Parameter Description	Criteria	Number of samples assessed	Number of samples exceed criteria	Mean of samples assessed (avg or geomean)	Mean of samples that exceed criteria	Dataset Qualifier	Impairment Level	Impairment Category
0823_02	General Use	Nutrient Screening Levels	Total Phosphorus						ID	CS*	
0823_02	General Use	Nutrient Screening Levels	Ammonia						ID	CS*	
0823_02	General Use	Nutrient Screening Levels	Orthophosphorus						ID	CS*	
0823_02	General Use	Nutrient Screening Levels	Nitrate						ID	CS*	
0823_04	General Use	Nutrient Screening Levels	Nitrate						ID	CS*	
0823A_01	Aquatic Life Use	Dissolved Oxygen grab screening level	Dissolved Oxygen Grab	5	73	14		3.64	AD	CS	
0823B_01	General Use	Nutrient Screening Levels	Nitrate	1.95	15	15		10.8	AD	CS	
0823B_01	General Use	Nutrient Screening Levels	Orthophosphorus	0.37	15	15		2.31	AD	CS	
0823B_01	General Use	Nutrient Screening Levels	Total Phosphorus	0.69	15	15		2.49	AD	CS	
0823D_01	Recreation Use	Bacteria Geomean	E. coli	126	10	1	246.45		LD	CN	
0823D_01	General Use	Nutrient Screening Levels	Nitrate	1.95	15	3		6.54	AD	CS	

Dataset Qualifier Codes

AD-Adequate Data (10 or more samples)

ID-Inadequate data (less than 4 samples)

LD-Limited Data (between 4 and 9 samples)

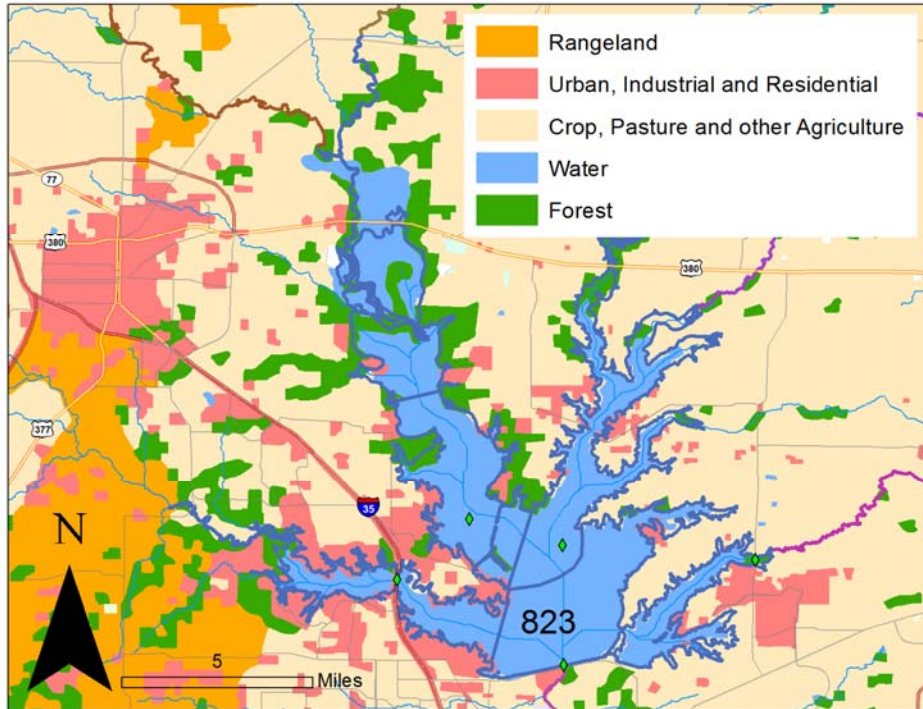
Impairment Level

CN-Use concern

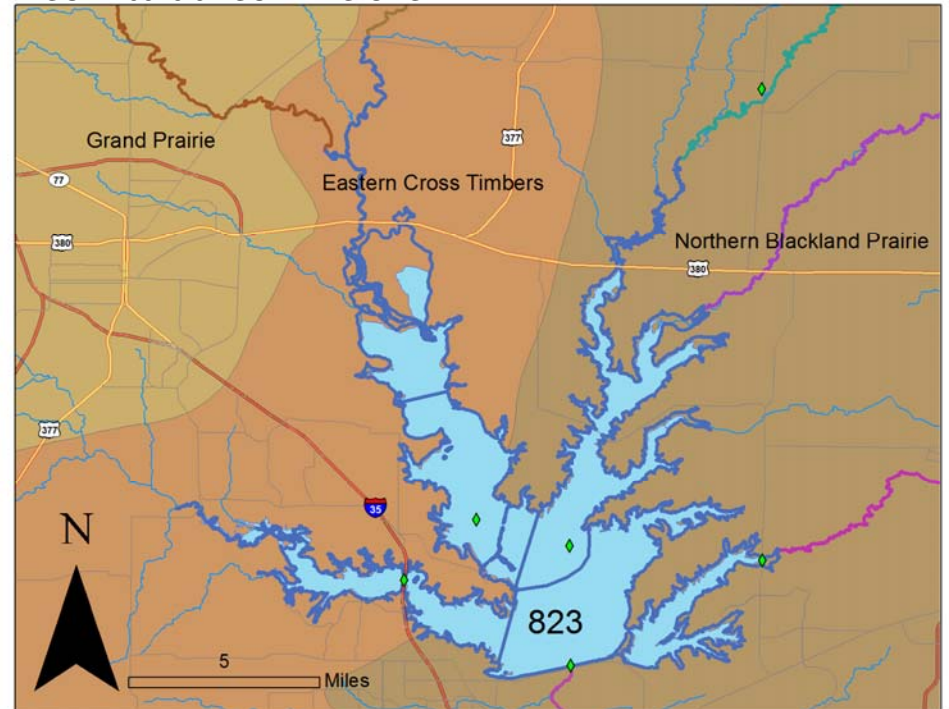
CS-Screening level concern

CS\*-Screening level concern carried forward from previous assessments

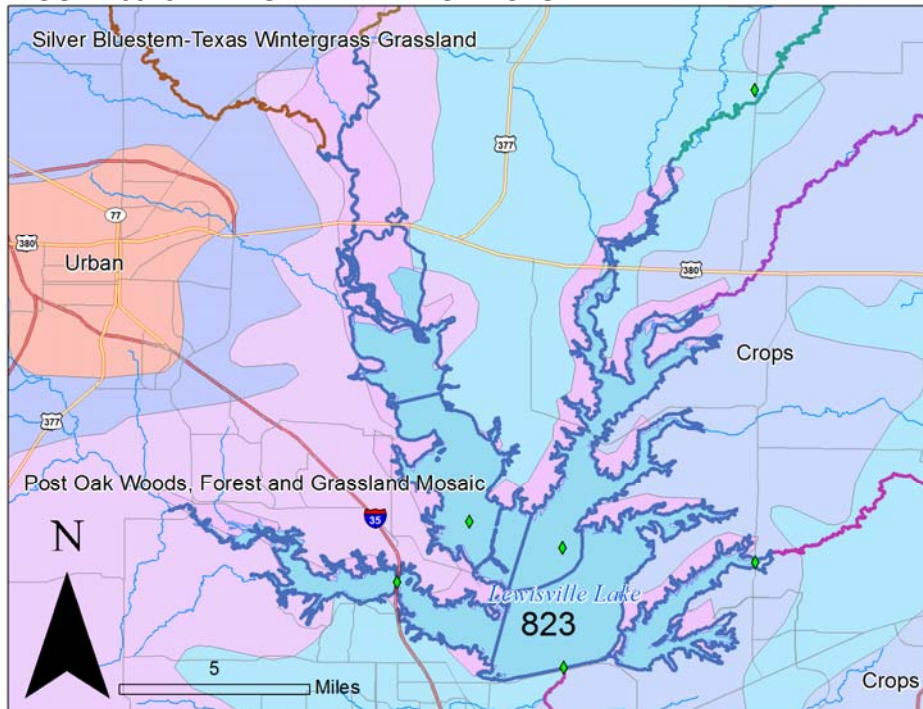
**FIGURE 0823.2: LAND COVER**



**FIGURE 0823.3: SOIL REGIONS**



**FIGURE 0823.4: VEGETATIVE PROVINCES**



**TABLE 0823.3: New and Renewed Discharge Permits**

Segment	Notice received by TRA on	Permitee/Facility	County	Permit Type	Action	Status	Permit Number
823	7/29/2013	City of Denton	Denton	Water Quality	Renew al	Final	10027-003
823	7/29/2013	City of Gunter	Grayson	Water Quality	Renew al	Draft	10569-001
823	7/10/2013	City of Krum	Denton	Water Quality	Renew al	Draft	10729-001
823	6/25/2013	Slidell Independent School District	Wise	Water Quality	Amendment	Notice Received	14306-001
823	6/25/2013	City of Sanger	Denton	Water Quality	Renew al	Draft	14372-001
823	3/12/2013	THE COLONY, CITY - STEWART CR STP	Denton	Water Quality	Renew al	Final	11570-001
823	12/26/2012	UPPER TRINITY REGIONAL WATER DISTRICT	Denton	Water Quality	Renew al	Final	10698-003
823	12/26/2012	LITTLE ELM, TOWN - STP	Denton	Water Quality	Renew al	Final	11600-001
823	10/15/2012	NORTH TEXAS MUNICIPAL WATER DISTRICT	Denton	Water Quality	Renew al	Final	14008-001
823	8/6/2012	KRUM, CITY OF	Denton	Water Quality	Renew al	Final	10729-001
823	7/17/2012	SLIDELL INDEPENDENT SCHOOL DISTRICT	Wise	Water Quality	Renew al	Final	14306-001
823	6/11/2012	BRIARWOOD LUTHERAN MINISTRIES - STP	Denton	Water Quality	Renew al	Final	12605-002
823	5/16/2012	EXIDE TECHNOLOGIES - FRISCO SECONDARY LEAD SMELTER	Collin	Water Quality	Renew al	Final	02964-000
823	2/17/2012	TALLEY LAND DEVELOPMENT LTD - STP	Collin	Water Quality	Renew al	Final	14817-001
823	1/19/2012	LITTLE ELM, TOWN OF	Denton	Water Quality	Renew al	Final	11600-001
823	1/9/2012	UTRWD - LAKE CITIES STP	Denton	Water Quality	Renew al	Final	10698-001
823	1/9/2012	LAKEWOOD VILLAGE, CITY - STP	Denton	Water Quality	Renew al	Final	10903-001
823	1/9/2012	MARINE QUEST - HIDDEN COVE, L.P. -STP	Denton	Water Quality	Renew al	Final	13785-001



FIGURE 0823.5:



FIGURE 0823.6:



FIGURE 0823.7:



FIGURE 0823.8:



# Elm Fork Subwatershed

## 0825 – Denton Creek

### **SEGMENT DESCRIPTION**

Segment 0825 begins at the confluence with the Elm Fork Trinity River in Dallas County and continues up to Grapevine Dam in Tarrant County. There is one assessment unit in this segment, 0825\_01, that covers the entire segment. Sites in this assessment unit include 11034 and 14244.

Figure 0825.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs). Table 0825.1 lists the stations being monitored in fiscal year 2014 as well as the parameters being collected and the frequency of sampling.

### **HYDROLOGIC CHARACTERISTICS**

The median annual average discharge in this segment is 49 cubic feet per second (cfs) based on historic values over the past four years at the USGS flow gage of Denton Creek near Grapevine (08055000). The outfall of the Town of Flower Mound contributes to Denton Creek at the confluence of Bakers Branch, approximately 1.4 river miles upstream of this gage. As 0825 is below Grapevine Lake, a flood control reservoir, flood control releases determine much of the discharge of 0825.

### **IMPAIRMENT/AREA OF INTEREST DESCRIPTION**

There are no impairments or concerns in this segment.

### **LAND USE AND NATURAL CHARACTERISTICS**

Despite the proximity to the fast-growing DFW 'Mid-cities' area, this portion of the Elm Fork flows through land mostly classified as agriculture/pasture. The watershed of segment 0825 is located entirely within the Blackland Prairie ecoregion.

### **POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST**

There are no impairments or concerns in this segment.

### **POTENTIAL STAKEHOLDERS**

Cities of Grapevine, Southlake, Carrollton, Irving, Farmers Branch, Dallas and Fort Worth.

### **RECOMMENDATIONS FOR IMPROVING WATER QUALITY**

There are no impairments or concerns in this segment.

### **ONGOING PROJECTS**

There are no ongoing projects in this segment.

### **MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)**

There are no known or anticipated events that would affect water quality in this segment.

ment. As this segment is downstream of Grapevine Lake, it can be expected that issues impacting that reservoir would also affect this segment.

### **IMAGES**

See Figures 0825.5 to 0825.8 for images of this segment.

**Monitoring Sites**

- Monitoring Sites
- CAFO
- Landfill

**Discharger - Flow (mgd)**

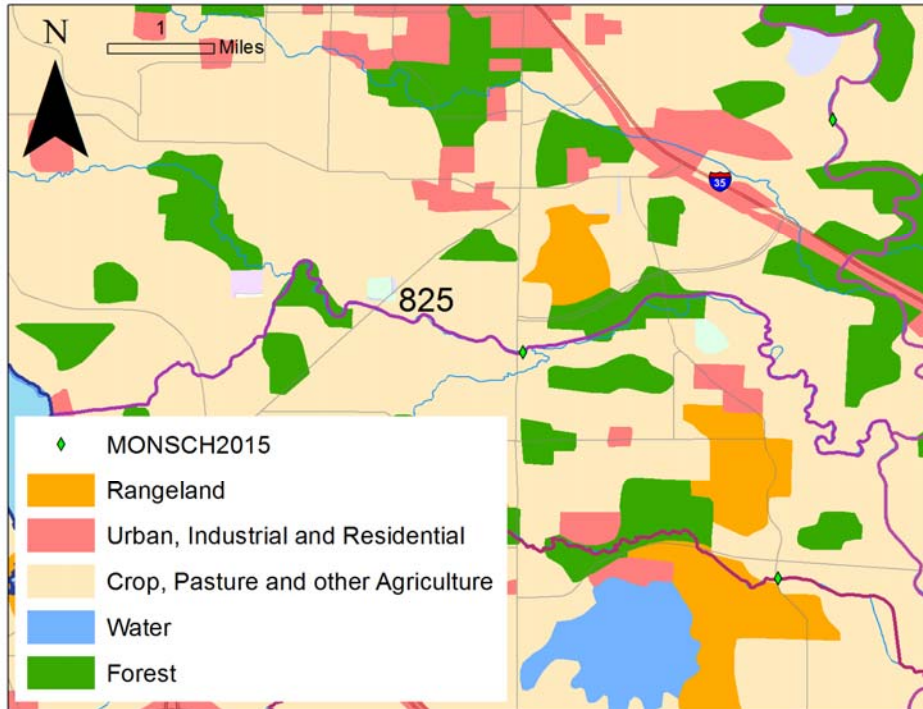
- 0.0 - 3.5
- 3.6 - 18.0
- 18.1 - 64.0
- 64.1 - 200.0



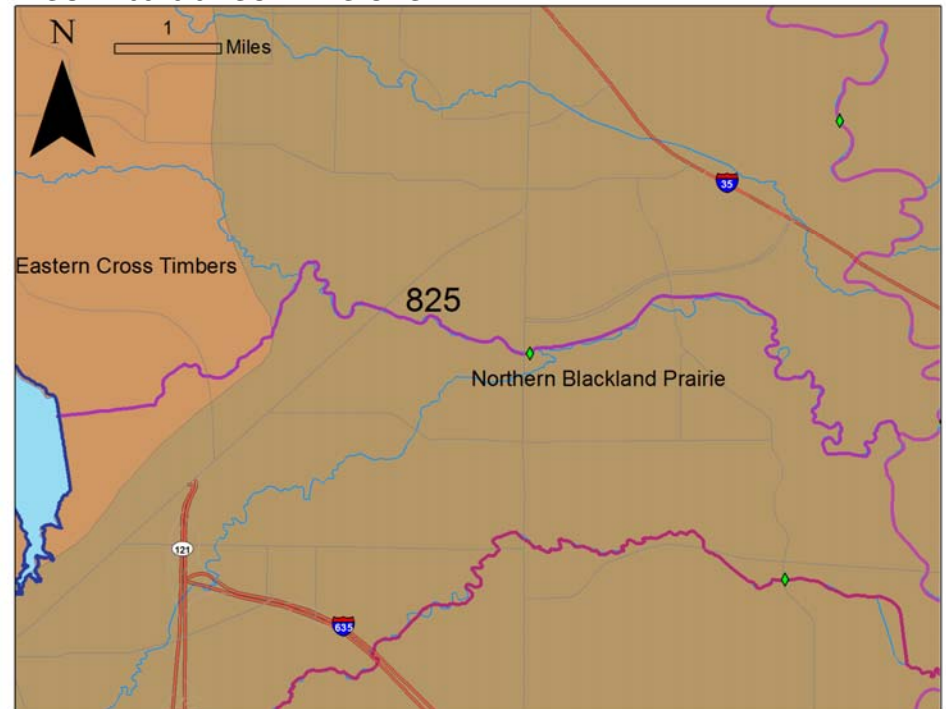
**TABLE 0825.1: Fiscal Year 2015 Monitoring**

Monitoring Entity	Segment	AU	Site ID	Site Description	Monitoring Type	24 Hour DO	Metals Water	Conventional	Bacteria	Flow	Field
Dallas	0825	0825_01	14244	DENTON CREEK 41 METERS UPSTREAM OF DENTON TAP ROAD 2 MI NORTH OF COPPELL (E5)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)

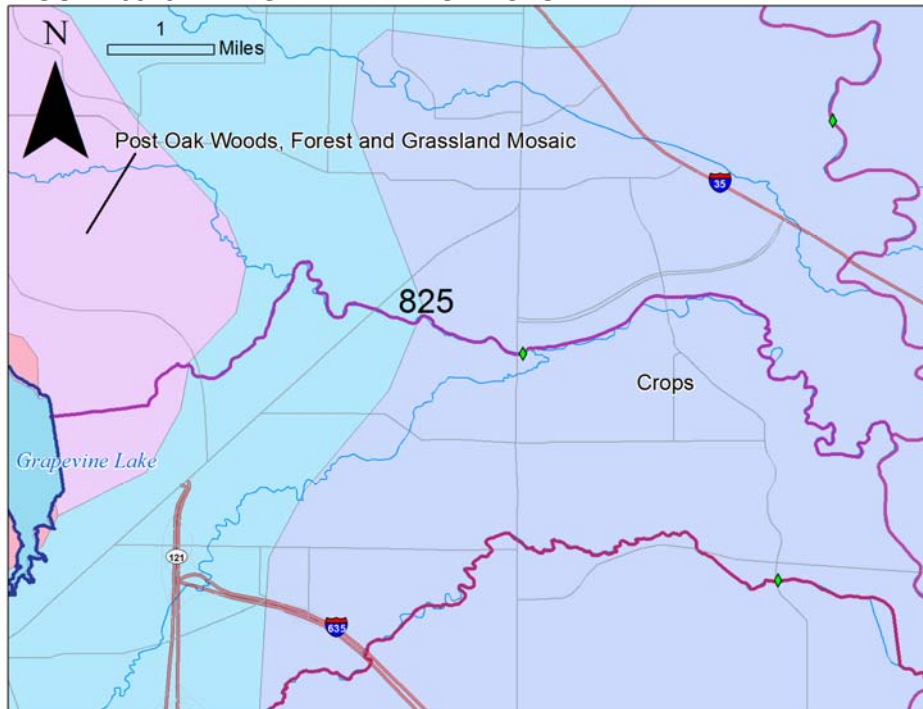
**FIGURE 0825.2: LAND COVER**



**FIGURE 0825.3: SOIL REGIONS**



**FIGURE 0825.4: VEGETATIVE PROVINCES**





**FIGURE 0825.5:**



**FIGURE 0825.6:**



**FIGURE 0825.7:**



**FIGURE 0825.8:**





# Elm Fork Subwatershed

## **0822 – Elm Fork Trinity River Below Lewisville Lake**

### **SEGMENT DESCRIPTION**

Segment 0822 begins at the confluence with the West Fork Trinity River in Dallas County and continues up to Lewisville Dam in Denton County. There are four assessment units in this segment. 0822\_01 is the lower 11 miles of segment. Sites in this assessment unit include 16436, 17163, 17164, 18310, 18648, and 20287. 0822\_02 is a reach 4.5 miles upstream to 7.5 miles downstream the Dallas Water Utilities intake. Sites in this assessment unit include 11024, 16438, and 17162. 0822\_03 is a reach 1.0 mi upstream to 4.5 miles downstream of SH 121. Sites in this assessment unit include 13615 and 18358. 0822\_04 is the upper 1.5 miles of segment. Sites in this assessment unit include 15252 and 16437.

Unclassified water bodies in this segment include those listed below.

**0822A—Cottonwood Branch**—A 6 mile stretch of Cottonwood Branch running upstream from the confluence with Hackberry Creek up to Valley View Road in Dallas County. There are two assessment units in this segment. 0822A\_01 is a 2.5 mile stretch of Cottonwood Branch running upstream from the confluence with Hackberry Creek to approximately 0.5 miles downstream of North Story Road in Dallas County. Sites in this assessment unit include 17167, 17168, and 18359. 0822A\_02 is a 3.5 mile stretch of Cottonwood Branch running upstream from approximately 0.5 miles downstream of North Story Road up to Valley View Road in Dallas County. Sites in this assessment unit include 17165 and 17166.

**0822B—Grapevine Creek**—A 5.5 mile stretch of Grapevine Creek running upstream from Coppell Road in Coppell in Dallas County up to approximately 1.5 miles upstream of SH 21 in Tarrant County. There is one assessment unit in this segment. 0822B\_01 is a 5.5 mile stretch of Grapevine Creek running upstream from Coppell Road in Coppell in Dallas County up to approximately 1.5 miles upstream of SH 21 in Tarrant County. This segment includes sites 17169, 17531, and 17939.

**0822C—Hackberry Creek**—A 5.5 mile stretch of Hackberry Creek running upstream from confluence with Cottonwood Branch up to approximately 2.4 miles upstream of SH 114 in Irving in Dallas County. There is one assessment unit in this segment. 0822C\_01 is a 5.5 mile stretch of Hackberry Creek running upstream from the confluence with the South Fork Hackberry Creek up to approximately 2.4 miles upstream of SH 114 in Irving in Dallas County. This segment includes sites 17170, 17171, 17172, 17532, and 17938.

**0822D—Ski Lake**—A 65 acre reservoir located just south of the intersection of US 35E and spur 482 in Irving. This segment includes site 17849.

Figure 0822.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs). Table 0822.1 lists the stations being monitored in fiscal year 2014 as well as the parameters being

collected and the frequency of sampling.

### **HYDROLOGIC CHARACTERISTICS**

The discharge of segment 0822 is determined by the flood control reservoir Lake Lewisville, with contributions for approximately 10 small creeks, as well as treated wastewater outfalls from the Town of Flower Mound, the City of Lewisville and the City of Dallas; each permitted for 10-15 million gallons per day (MGD). The median annual average discharge in the upper portion of this segment is 290 cubic feet per second (cfs) based on historic values over the past for years at the USGS flow gage of the Elm Fork Trinity River near Lewisville (08053000), the upper-most gage in the segment. The median value of discharge in the lower portion of the segment over the past four years is 199 cubic feet per second (cfs) based on historic values at the Elm Fork Trinity River at Spur 348, Irving, TX USGS flow gage (08055560).

### **IMPAIRMENT/AREA OF INTEREST DESCRIPTION**

Based on the 2012 Texas Water Quality Integrated Report, there are impairments in assessment units 0822\_01, 0822\_04, 0822A\_01, 0822A\_02, 0822B\_01, 0822C\_01, and 0822D\_01. Details of the assessment are located in Table 0822.2.

### **LAND USE AND NATURAL CHARACTERISTICS**

The north portion of the segment 0822 watershed is mainly agriculture and cropland, dotted with forested areas. The middle and lower portions are highly urbanized and include DFW International Airport. The watershed of segment 0822 falls completely within the Blackland Prairie ecoregion.

### **POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST**

It is possible that both the nutrient and Chlorophyll-a concerns in this segment are the result of the intense urban growth in the area that 0822 flows through: possibly including runoff from construction, public and private landscaping and the runoff from fertilized cropland in the northern area of the region. High pH can be caused by possible runoff from fertilizers and stock animal waste from the crop and range land in the surrounding watershed, as well as urban runoff from landscaping. This could also be the potential cause of the high nutrient sample result in 0826\_07.

### **POTENTIAL STAKEHOLDERS**

Cities of Lewisville, Grapevine, Dallas

### **RECOMMENDATIONS FOR IMPROVING WATER QUALITY**

Water quality education

Education of safe urban and farm fertilization practices

Stream-friendly management of stock animal wastes

### **ONGOING PROJECTS**

The Cottonwood Branch and Grapevine Creek Bacteria TMDL is currently ongoing in this segment. This TMDL focused on the E. coli impairments in 0822A and 0822B. The report for this project has been submitted for approval.

# **Elm Fork Subwatershed**

## **0822 – Elm Fork Trinity River Below Lewisville Lake** **(continued)**

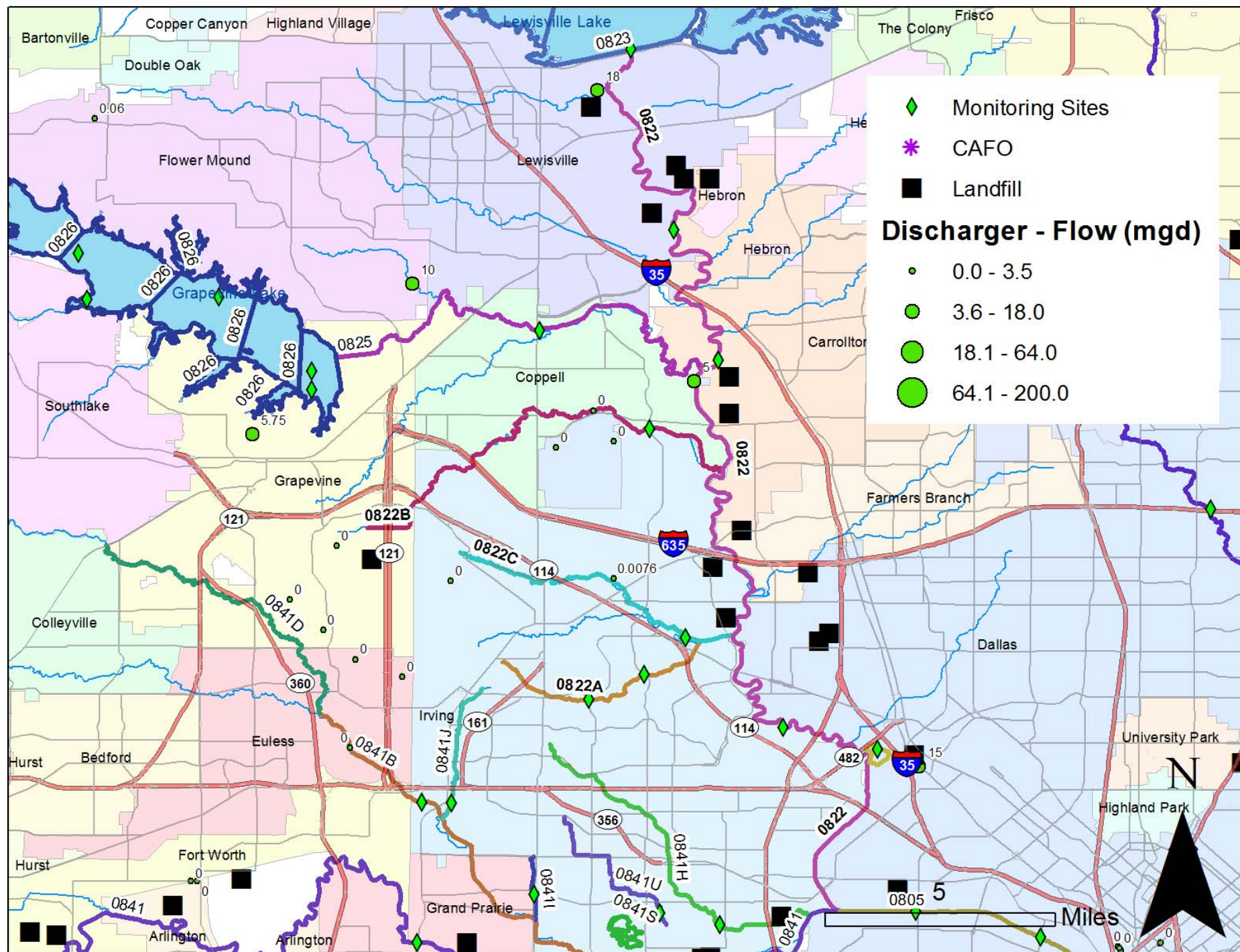
### **MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)**

There are no known or anticipated events that would affect water quality in this segment. However, this segment is highly urbanized and may be affected by common urban pollutants such as fertilizers and animal waste. In addition, there are several landfills along the segment. Three dischargers renewed their water quality permits in 2012. See Table 0822.3 for details.

### **IMAGES**

See Figures 0822.5 to 0822.8 for images of this segment.

**FIGURE 0822.1**





**TABLE 0822.1: Fiscal Year 2014 Monitoring**

Monitoring Entity	Segment	AU	Site ID	Site Description	Monitoring Type	24 Hour DO	Metals Water	Conventional	Bacteria	Flow	Field
TRA	0822	0822_01	20287	Elm Fork Trinity River at Wildwood Drive-Tom Braniff Drive in Dallas	RT		2 (Dissolved Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Nickel, Zinc)	4 (Hardness, NO <sub>2</sub> , NO <sub>2</sub> +NO <sub>3</sub> , NH <sub>3</sub> , TKN, TP, Chloride, Sulfate, Chlorophyll-a, TDS, OP)	4 (E. coli)	4	4 (Water Temp, Air Temp, Secchi Depth, Specific Conductance, DO, PH, Days Since Precipitation Event)
Dallas	0822	0822_02	16438	LM FORK TRINITY RIVER AT INTAKE OF DALLAS WATER UTILITIES ELM FK TREATMENT PLANT 738 M DOWNSTREAM OF CONFLUENCE WITH DENTON CK IN CARROLLTON (E2)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0822	0822_03	18358	ELM FORK TRINITY RIVER IMMEDIATELY DOWNSTREAM OF HEBRON PARKWAY SOUTHEAST OF LEWISVILLE TR255 (E4)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0822	0822_04	15252	ELM FORK TRINITY RIVER AT LEWISVILLE LAKE SPILLWAY 3 MI NORTHEAST OF LEWISVILLE (E1)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Irving	0822A	0822A_01	17167	COTTONWOOD BRANCH 71 METERS UPSTREAM OF NORTH MACARTHUR BOULEVARD IN IRVING	RT		2 (Dissolved Cadmium, Chromium, Copper, Lead, Zinc)	6 (NO <sub>2</sub> +NO <sub>3</sub> , NH <sub>3</sub> , TKN, TP, Hardness, Chlorophyll-a, OP)	6 (E. coli)		6 (Water Temp, Air Temp, Secchi Depth, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Irving	0822A	0822A_02	17166	COTTONWOOD BRANCH AT NORTH STORY ROAD IN IRVING	RT				6 (E. coli)	6	6 (Water Temp, Air Temp, Secchi Depth, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Irving	0822B	0822B_01	20311	Grapevine Creek at North MacArthur Blvd. 3.5 KM Upstream of the confluence with the Elm Fork Trinity River	RT				6 (E. coli)	6	6 (Water Temp, Air Temp, Secchi Depth, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Irving	0822C	0822C_01	17170	HACKBERRY CREEK AT COLWELL BOULEVARD IN IRVING	RT		2 (Dissolved Cadmium, Chromium, Copper, Lead, Zinc)	6 (NO <sub>2</sub> +NO <sub>3</sub> , NH <sub>3</sub> , TKN, TP, Hardness, Chlorophyll-a, OP)	6 (E. coli)	6	6 (Water Temp, Air Temp, Secchi Depth, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0822D	0822D_01	17849	SKI LAKE NEAR BARCHMAN TREATMENT PLANT INTAKE 543 METERS SOUTH AND 99 METERS WEST OF INTERSECTION OF SH 482 AND I 35 EAST (E3)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)

**TABLE 0822.2: 2012 Water Quality Integrated Report**

Segment and Assessment Unit	Use	Method	Parameter Description	Criteria	Number of samples assessed	Number of samples exceed criteria	Mean of samples assessed (avg or geomean)	Mean of samples that exceed criteria	Dataset Qualifier	Impairment Level	Impairment Category
0822_01	Aquatic Life Use	Dissolved Oxygen grab screening level	Dissolved Oxygen Grab	5	83	11		4.15	AD	CS	
0822_01	General Use	Nutrient Screening Levels	Chlorophyll-a	14.1	69	37		35.97	AD	CS	
0822_04	General Use	Nutrient Screening Levels	Chlorophyll-a						ID	CS*	
0822A_01	General Use	Nutrient Screening Levels	Chlorophyll-a						ID	CS*	
0822A_02	Recreation Use	Bacteria Geomean	E. coli	126	32	1	516.98		AD	NS	4a
0822B_01	Recreation Use	Bacteria Geomean	E. coli	126	26	1	171.95		AD	NS	4a
0822C_01	Aquatic Life Use	Dissolved Oxygen grab screening level	Dissolved Oxygen Grab	5	36	7		3.99	AD	CS	
0822D_01	General Use	Nutrient Screening Levels	Chlorophyll-a						ID	CS*	

Dataset Qualifier Codes

AD-Adequate Data (10 or more samples)

ID-Inadequate data (less than 4 samples)

Impairment Level

CS-Screening level concern

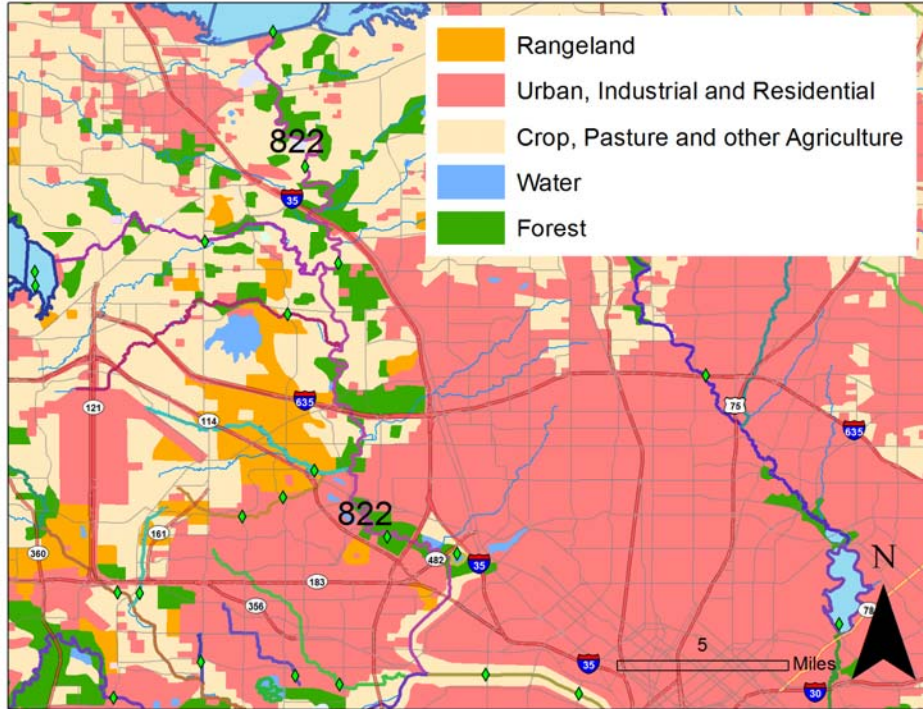
CS\*-Screening level concern carried forward from previous assessments

NS-Nonsupport

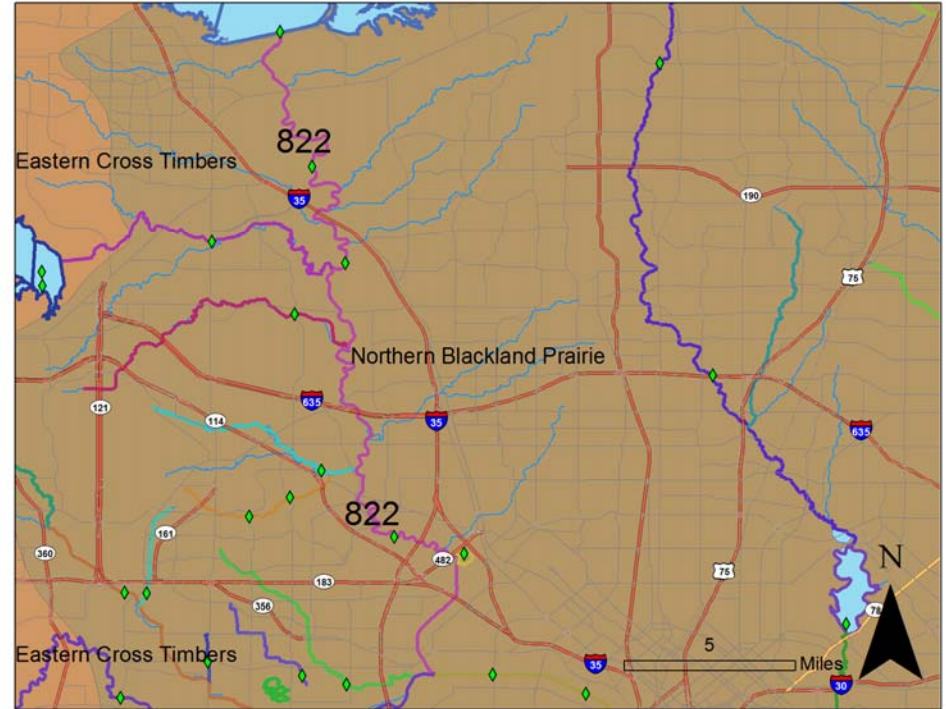
Impairment Category

4a-A TMDL has been completed and approved by EPA

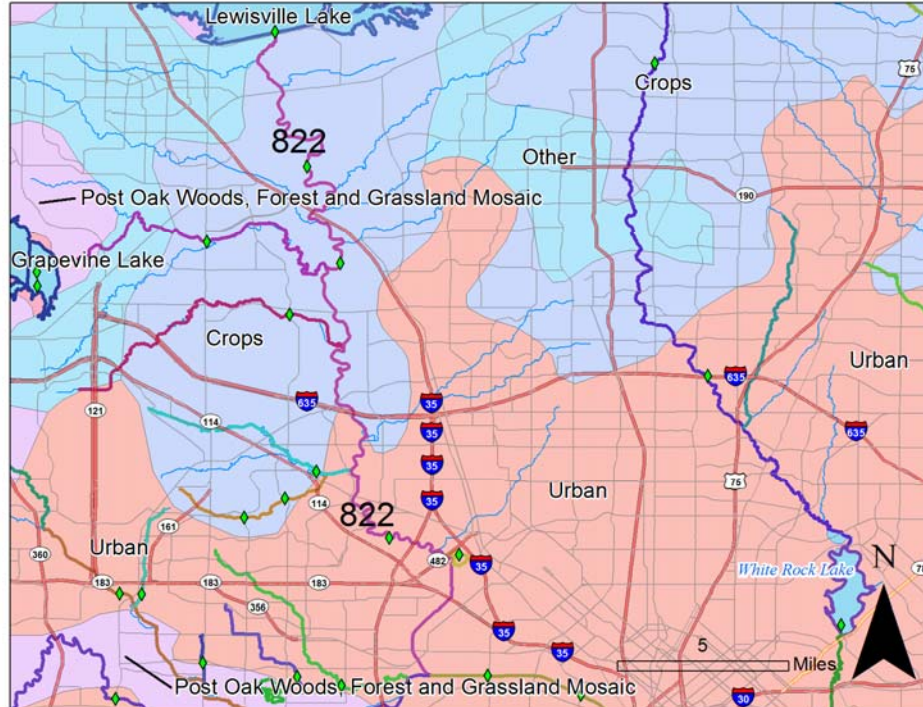
**FIGURE 0822.2: LAND COVER**



**FIGURE 0822.3: SOIL REGIONS**



**FIGURE 0822.4: VEGETATIVE PROVINCES**

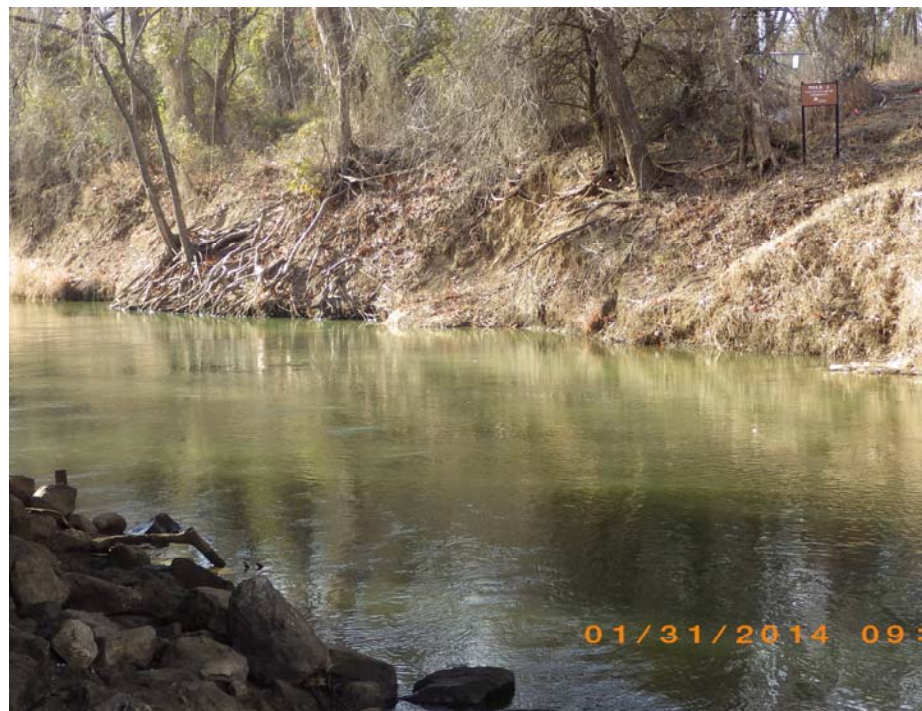




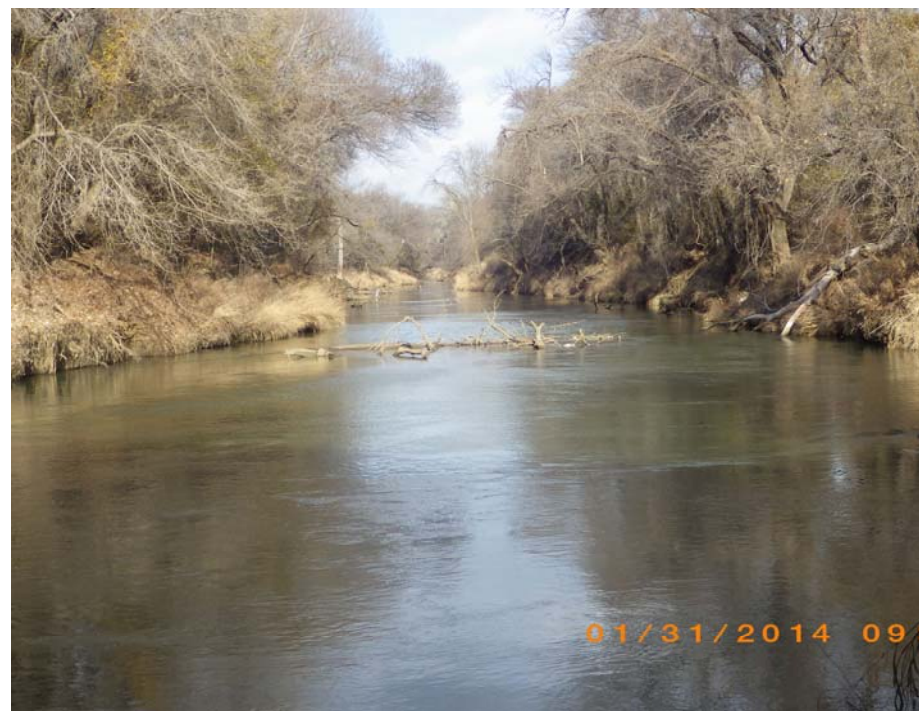
**TABLE 0822.3: New and Renewed Discharge Permits**

Segment	Notice received by TRA on	Permitee/Facility	County	Permit Type	Action	Status	Permit Number
822	6/11/2012	NTMWD - PANTHER CR STP	Denton	Water Quality	Renew al	Final	14245-001
822	5/23/2012	DALLAS, CITY OF	Dallas	Water Quality	Renew al	Final	10060-003
822	3/16/2012	DALLAS, CITY OF	Dallas	Water Quality	Renew al	Final	10060-005

**FIGURE 0822.5:**



**FIGURE 0822.6:**



**FIGURE 0822.7:**



**FIGURE 0822.8:**





# Elm Fork Subwatershed

## 0826 – Grapevine Lake

### SEGMENT DESCRIPTION

Segment 0826 begins at Grapevine Dam in Tarrant County and continues up to the normal pool elevation of 535 feet, impounding Denton Creek. There are eight assessment units in this segment. 0826\_01 is the lowermost portion of the reservoir. Sites in this assessment unit include 13873, 13874, 16113, 17827, 20891, 20890, and 20889. 0826\_02 is Morehead Creek cove. Sites in this assessment unit include 11036, 11037, 16118, and 20886. 0826\_03 is the lower portion of the reservoir north of Oak Grove Park. Sites in this assessment unit include 16114. 0826\_04 is North Main Slough cove. Sites in this assessment unit include 16116, 16117, and 20887. 0826\_05 is the middle portion of the reservoir east of Meadowmere Park. Sites in this assessment unit include 13875 and 16115. 0826\_06 is the middle portion of the reservoir southeast of Walnut Grove Park. Sites in this assessment unit include 13876, 16112, and 17828. 0826\_07 is the upper portion of the reservoir east of Marshall Creek Park. Sites in this assessment unit include 13877, 13878, 16111, and 20882. 0826\_08 is the remainder of reservoir. Sites in this assessment unit include 20883, 20881, and 20880.

Unclassified water bodies in this segment include those listed below.

0826A—Denton Creek—A perennial stream from the confluence with Grapevine Lake in Denton County to the headwaters northeast of Bowie in Montague County. There are four assessment units in this segment. 0826A\_01 is the lower 7.9 miles of creek. Sites in this assessment unit include 14485. 0826A\_02 is a reach from 15.7 miles upstream to 7.4 miles down stream of FM 156. Sites in this assessment unit include 14483. 0826A\_03 is a reach from 9.3 miles upstream to 15.7 miles downstream of Greenwood Road. 0826A\_04 is the upper 20.8 miles of creek.

0826B—Trail Creek—A perennial stream from the confluence with Denton Creek up to 2.1 km upstream of SH 156 in Justin.

0826C—Henrietta Creek—A 3 mile stretch of Henrietta Creek running upstream from the confluence with Denton Creek to the confluence with Elizabeth Creek. This segment includes site 16825.

Figure 0826.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs). Table 0826.1 lists the stations being monitored in fiscal year 2014 as well as the parameters being collected and the frequency of sampling.

### HYDROLOGIC CHARACTERISTICS

Grapevine Lake has a conservation pool elevation of 535 feet and is fed by Denton Creek. This reservoir is used for flood control, water supply, and recreational activities. At the time of this writing, the reservoir has been below the conservation pool elevation by up to 9.99 feet since April 28, 2012.

### IMPAIRMENT/AREA OF INTEREST DESCRIPTION

Based on the Draft 2012 Texas Water Quality Integrated Report, there are impairments in assessment units 0826\_07 and 0826A\_01. Details of the assessment are located in Table 0826.2.

### LAND USE AND NATURAL CHARACTERISTICS

The land near the classified sections of 0826 is a mottled mix of crop and range land, forest and urban development. A large swath of range land with areas of forest lies just north of the body of 0826, with mainly cropland with patches of urban development to the south, east and west of the segment. This portion of the segment is located within the Eastern Cross Timbers Ecoregion.

Land use in the surrounding areas of the unclassified streams of 0826 including 0826A, 0826B and 0826C is predominantly crop and rangeland. The unclassified streams of 0826 flow through the Western Cross Timbers (only 0826A) and Grand Prairie Ecoregions (0826A, 0826B and 0826C).

### POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST

High nutrients in 0826A\_01 may be due to this being the most upstream part of a perennial stream (Denton Creek); periods of slow moving or disconnected flow in this assessment unit may be keeping the nutrients from dissipating. Samples at assessment unit 0826\_07 (most upstream portion of Grapevine Lake) have shown values high in nutrients and pH. High pH can be caused by possible runoff from fertilizers and stock animal waste from the vast crop and range land in the surrounding watershed. This could also be the potential cause of the high nutrient sample result in 0826\_07.

### POTENTIAL STAKEHOLDERS

Cities of Denton, Grapevine, Southlake, Colleyville, Trophy Club, Justin  
Northlake Partners, Ltd.  
Aviation Utilities Services, Inc  
Grapevine Lake Park & Recreation Authorities

### RECOMMENDATIONS FOR IMPROVING WATER QUALITY

Water quality education  
Education of safe urban and farm fertilization practices  
Stream-friendly management of stock animal wastes

### ONGOING PROJECTS

There are no ongoing projects in this segment.

### MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)

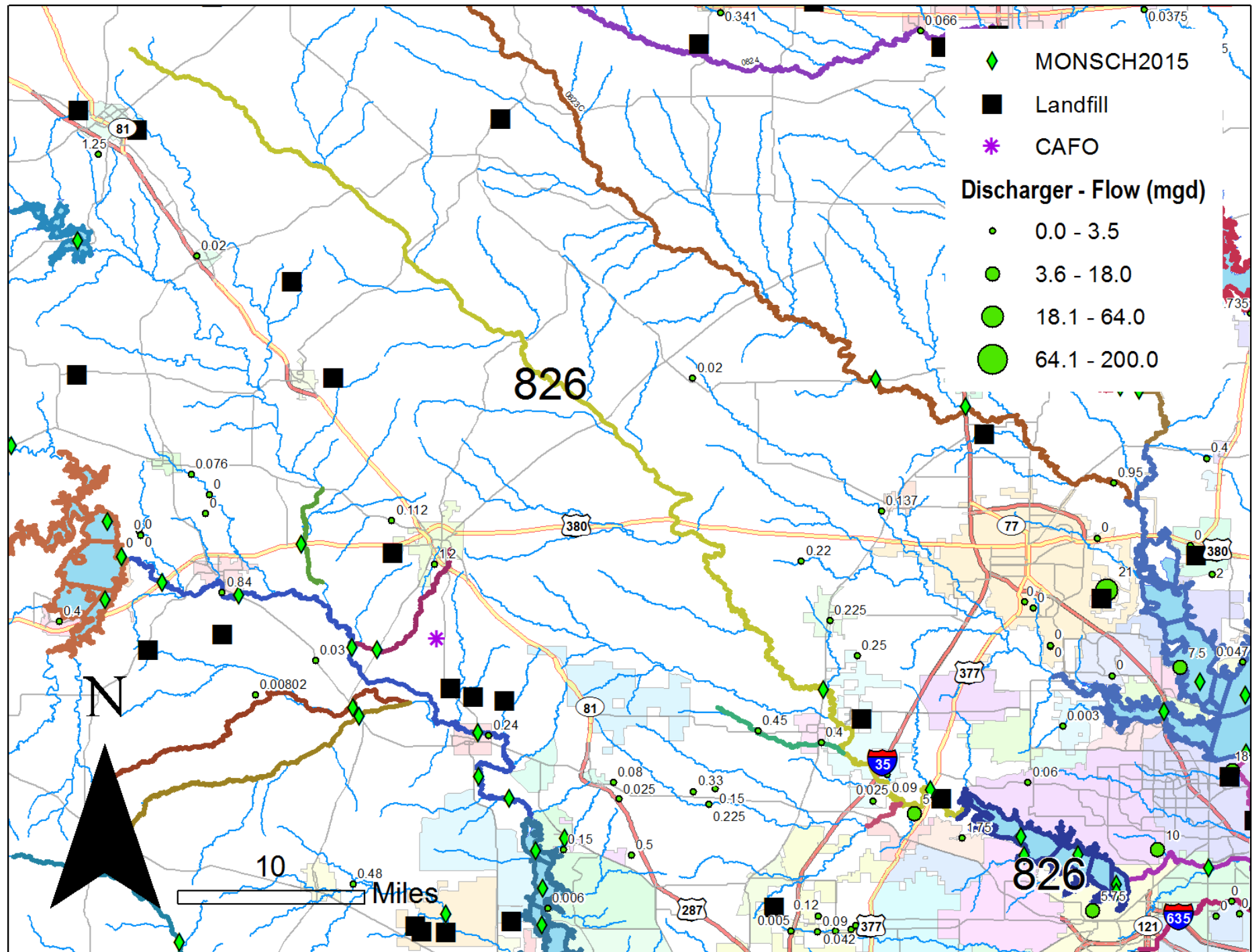
There are no known or anticipated events that would affect water quality in this segment. Three dischargers renewed their water quality permits in 2012 while two dischargers applied for amendments to their water quality permits. In 2013, two dischargers renewed their water quality permits. See Table 0826.3 for details.

### IMAGES

See Figures 0826.5 to 0826.8 for images of this segment.



**FIGURE 0826.1**



**TABLE 0826.1: Fiscal Year 2014 Monitoring**

Monitoring Entity	Segment	AU	Site ID	Site Description	Monitoring Type	24 Hour DO	Metals Water	Conventional	Bacteria	Flow	Field
Dallas	0826	0826_01	17827	GRAPEVINE LAKE AT DALLAS WATER UTILITIES INTAKE 349 METERS NORTH AND 328 METERS EAST OF INTERSECTION OF SILVERSIDE DR AND PARK ROAD 7 (G4)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0826	0826_05	13875	GRAPEVINE LAKE USGS SITE BC 753 METERS SOUTH AND 484 METERS WEST OF INTERSECTION OF WEST MURREL PARK ROAD AND SIMMONS ROAD (G5)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0826	0826_06	17828	GRAPEVINE LAKE AT LITTLE PETES MARINA 392 METERS NORTH AND 136 METERS EAST OF INTERSECTION OF THOUSAND OAKS COURT AND CARMEL COURT (G3)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0826A	0826A_01	14485	DENTON CREEK AT US 377 WEST OF LAKE GRAPEVINE (G2)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0826A	0826A_02	14483	DENTON CREEK AT FM 156 2.4 MILES NORTH OF JUSTIN (G1)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)

**TABLE 0826.2: 2012 Water Quality Integrated Report**

Segment and Assessment Unit	Use	Method	Parameter Description	Criteria	Number of samples assessed	Number of samples exceed criteria	Mean of samples assessed (avg or geometric)	Mean of samples that exceed criteria	Dataset Qualifier	Impairment Level	Impairment Category
0826_07	General Use	High pH	pH	9	10	4		9.48	AD	NS	5c
0826_07	General Use	Nutrient Screening Levels	Nitrate						ID	CS*	
0826A_01	General Use	Nutrient Screening Levels	Nitrate						ID	CS*	

Dataset Qualifier Codes

AD-Adequate Data (10 or more samples)

ID-Inadequate data (less than 4 samples)

Impairment Level

CS\*-Screening level concern carried forward from previous assessments

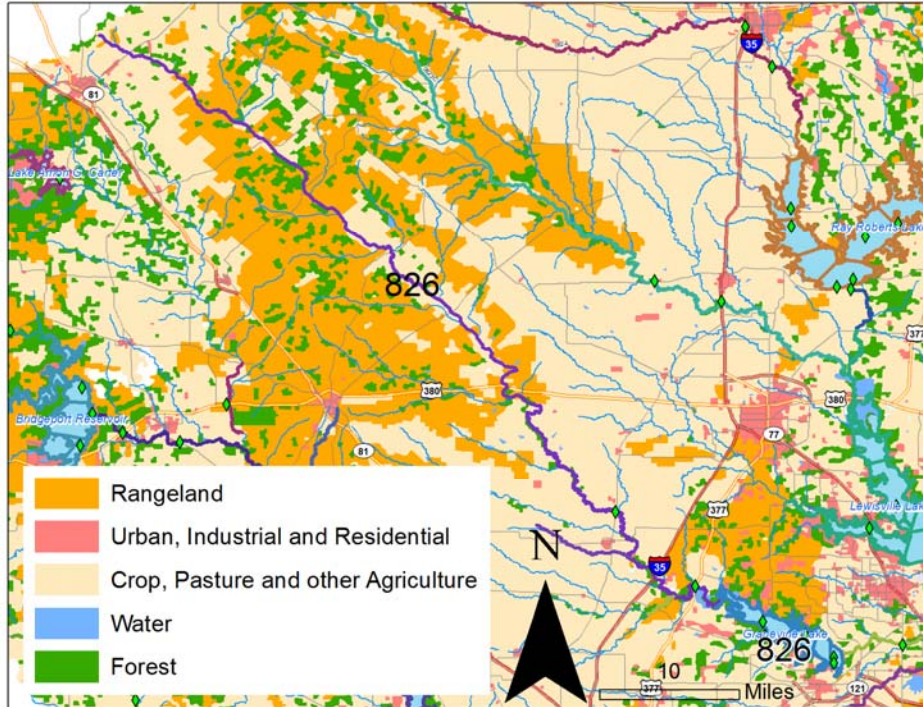
NS-Nonsupport

Impairment Category

5c-Additional data and information will be collected before a TMDL is scheduled



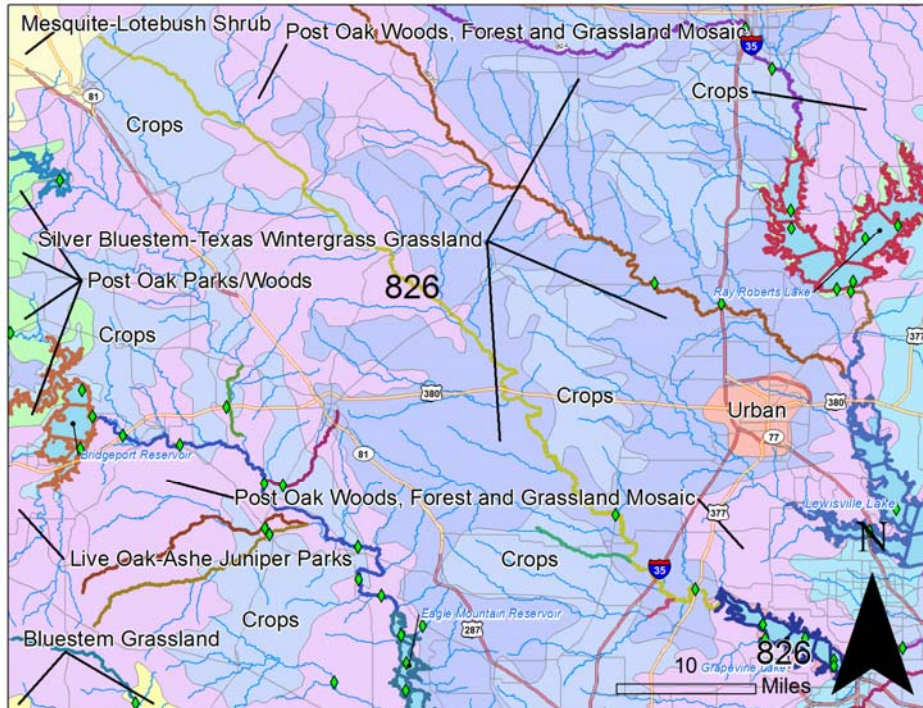
**FIGURE 0826.2: LAND COVER**



**FIGURE 0826.3: SOIL REGIONS**



**FIGURE 0826.4: VEGETATIVE PROVINCES**



**TABLE 0826.3: New and Renewed Discharge Permits**

Segment	Notice received by TRA on	Permittee/Facility	County	Permit Type	Action	Status	Permit Number
826	7/29/2013	City of Justin	Denton	Water Quality	Renew al	Draft	11312-001
826	6/25/2013	Northlake Partners, Ltd	Denton	Water Quality	Renew al	Draft	14484-001
826	7/17/2012	DENTON, CITY OF	Denton	Water Quality	Renew al	Final	10027-004
826	5/16/2012	TRA-DCRWS	Denton	Water Quality	Renew al	Final	13457-001
826	2/29/2012	TRA - DCRWS	Denton	Water Quality	Amendment	Draft	13457-001
826	2/17/2012	AVIATION UTILITIES SERVICES, INC. - STP	Denton	Water Quality	Renew al	Final	13920-001
826	1/19/2012	TRA - DCRWS	Denton	Water Quality	Amendment	Draft	13457-001



**FIGURE 0826.5:**



**FIGURE 0826.6:**



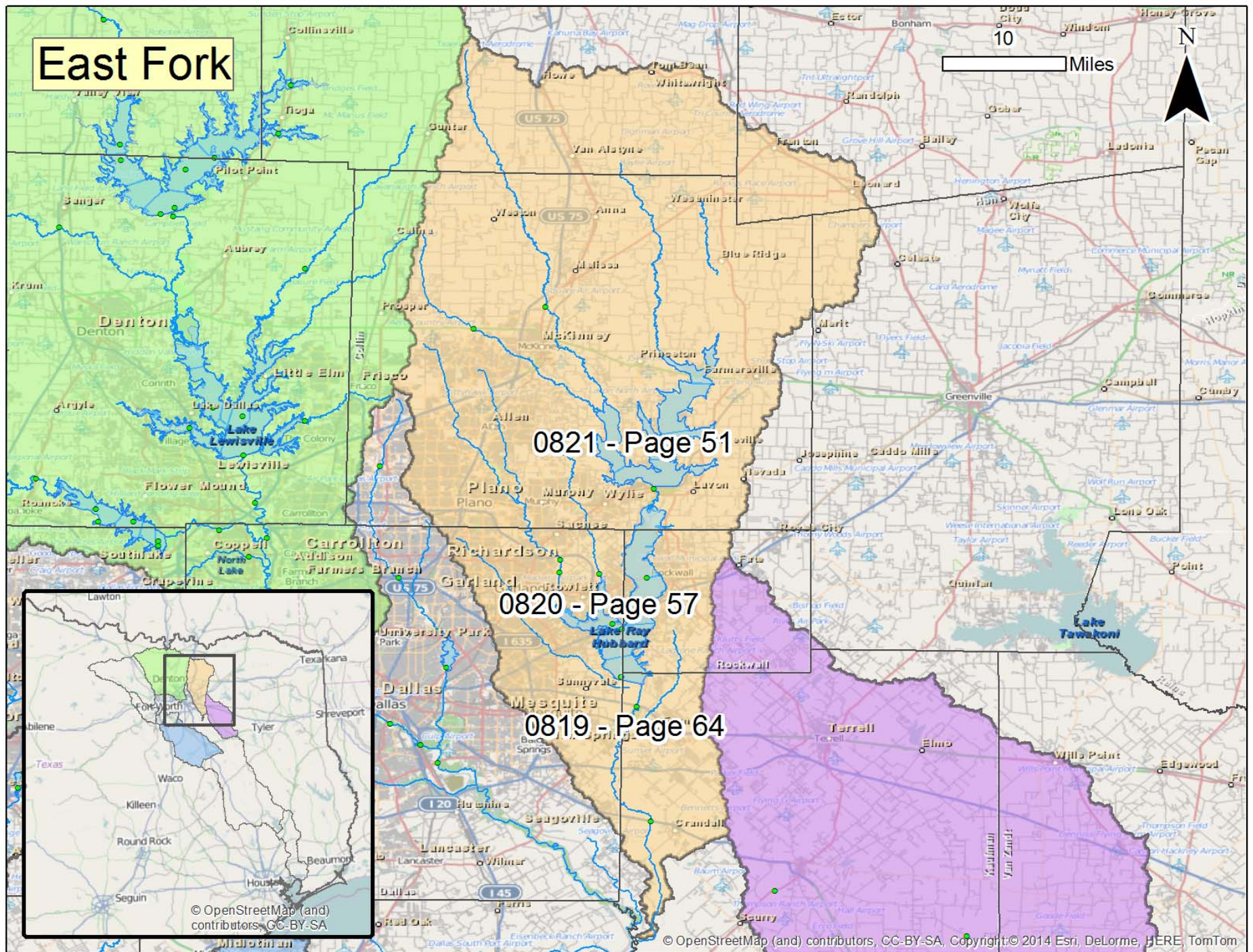
**FIGURE 0826.7:**



**FIGURE 0826.8:**









# East Fork Subwatershed

## 0821 – Lake Lavon

### SEGMENT DESCRIPTION

Segment 0821 begins at Lavon Dam in Collin County and continues up to the normal pool elevation of 492 feet, impounding the East Fork Trinity River. There are four assessment units in this segment. 0821\_01 is the lowermost portion of the reservoir. Sites in this assessment unit include 15684 and 15685. 0821\_02 is the East Fork arm. Sites in this assessment unit include 15686. 0821\_03 is the middle portion of Sister Grove Creek arm. Sites in this assessment unit include 15687. 0821\_04 is the remainder of segment.

Unclassified water bodies in this segment include those listed below.

0821A—Pilot Grove Creek—A perennial stream from the confluence of Desert Creek up to FM 121 near Blue Ridge.

0821B—Sister Grove Creek—From the confluence with Lake Lavon in Collin County up to the confluence of West Prong Sister Grove Creek/East Prong Sister Grove Creek, east of Van Alstyne in Grayson County. This segment includes site 13613.

0821C—Wilson Creek—From the confluence with Lake Lavon in Collin County up to West FM 455 just east of Celina in Collin County. This segment includes sites 10777 and 15041.

0821D—East Fork Trinity River above Lake Lavon—A portion of the East Fork Trinity River extending from the confluence with Lake Lavon (segment 0821) to the upper end of the water body in Collin County. This segment includes site 13740.

Figure 0821.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs).

### HYDROLOGIC CHARACTERISTICS

Lake Lavon has a conservation pool elevation of 492 feet and is fed by the East Fork Trinity River. This reservoir is used for flood control, water supply, and recreational activities. At the time of this writing, the reservoir has been below the conservation pool elevation by up to 12.61 feet since May 19, 2012.

### IMPAIRMENT/AREA OF INTEREST DESCRIPTION

Based on the 2012 Texas Water Quality Integrated Report, there are impairments in assessment units 0821\_01, 0821C\_01, and 0821D\_01. Details of the assessment are located in Table 0821.1.

### LAND USE AND NATURAL CHARACTERISTICS

The majority of land use in the 0821 watershed is crop, pasture and other agriculture, with some forest dotting the land adjacent to 0821 and tributaries. There are also some large sections of urban development. The drainage area falls entirely within the Northern Blackland Prairie ecoregion.

### POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST

There is an E. coli concern in assessment units 0821C\_01 and 0821D\_01. This may be due to livestock runoff in the vast amount of agricultural land use that each of these assessment units flow through. The nutrient impairment in 0821\_01 might possibly be due to natural occurrence of nutrients in sediment buildup from the streams in the Lake.

### POTENTIAL STAKEHOLDERS

Cities of McKinney, Anna, Van Alstyne, Allen, Leonard, Prosper, Garland, Dallas  
Walton Texas, LP  
Wylie Northeast SUD  
East Fork Partners, LLC  
Lake Lavon Baptist Encampment

### RECOMMENDATIONS FOR IMPROVING WATER QUALITY

Water quality education  
Education of safe urban and farm fertilization practices  
Stream-friendly management of stock animal wastes

### ONGOING PROJECTS

There are no ongoing projects in this segment.

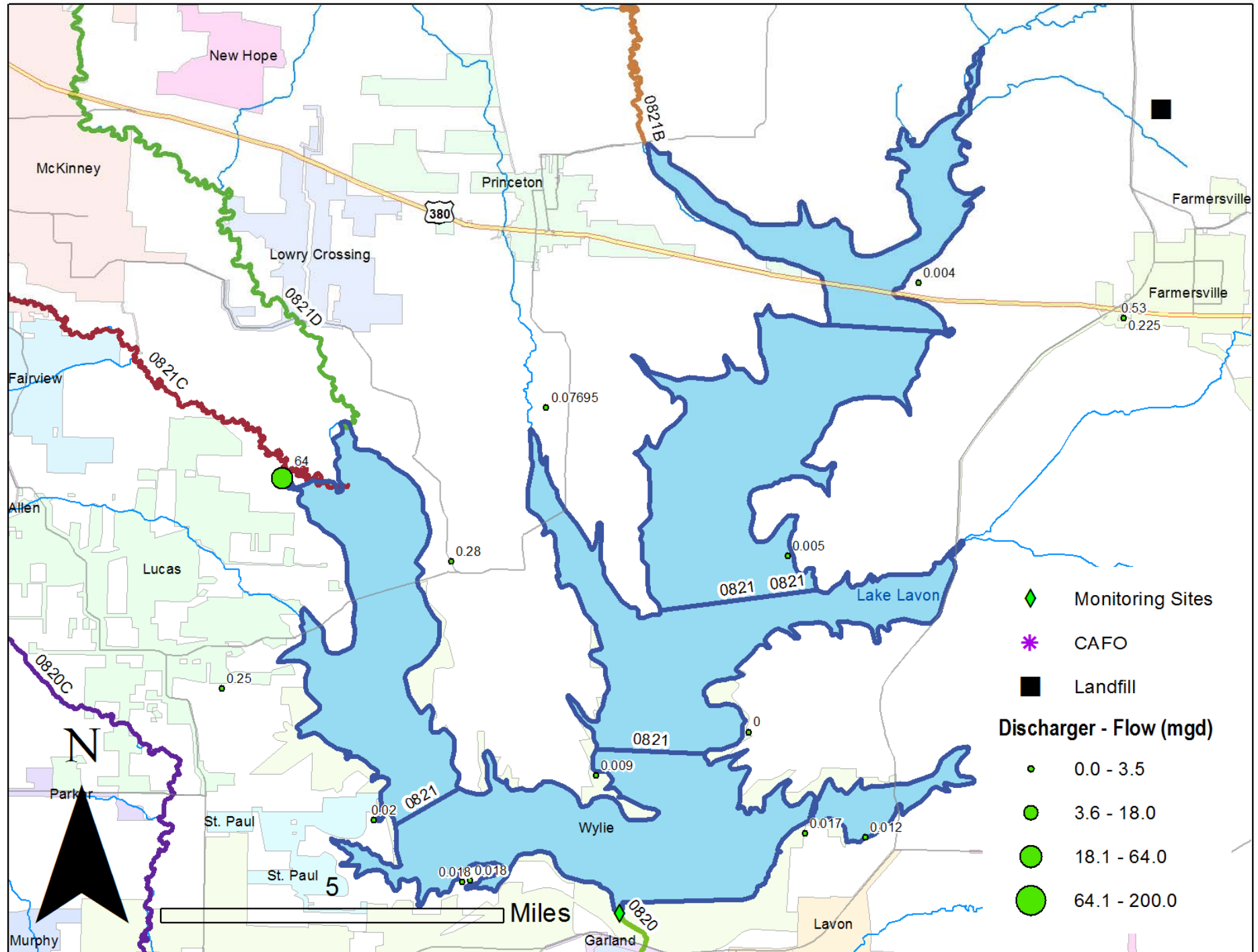
### MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)

Zebra mussels were found in Sister Grove Creek in 2009 and 2010. In 2013, zebra mussels were also found in Lake Lavon. Due to their ability to reproduce quickly and filter large amounts of water, zebra mussels can dramatically change the food web of a reservoir. In addition, they selectively reject blue-green algae which can lead to blooms of these algae which are associated with taste and odor problems in finished drinking water. Lake Lavon receives water transfers from the North Texas Municipal Water District East Fork diversion below Lake Ray Hubbard as well as from lakes Tawakoni and Chapman. Eight dischargers renewed their water quality permits and one received an amendment to their water quality permit in 2012. See Table 0821.2 for details.

### IMAGES

See Figures 0821.5 to 0821.8 for images of this segment.

FIGURE 0821.1





**TABLE 0821.1: 2012 Water Quality Integrated Report**

Segment and Assessment Unit	Use	Method	Parameter Description	Criteria	Number of samples assessed	Number of samples exceed criteria	Mean of samples assessed (avg or geomean)	Mean of samples that exceed criteria	Dataset Qualifier	Impairment Level	Impairment Category
0821_01	General Use	Nutrient Screening Levels	Nitrate						ID	CS*	
0821C_01	Recreation Use	Bacteria Geomean	E. coli	126	24	1	180.76		AD	NS	5c
0821D_01	Recreation Use	Bacteria Geomean	E. coli	126	17	1	167.83		AD	NS	5c

Dataset Qualifier Codes

AD-Adequate Data (10 or more samples)

ID-Inadequate data (less than 4 samples)

Impairment Level

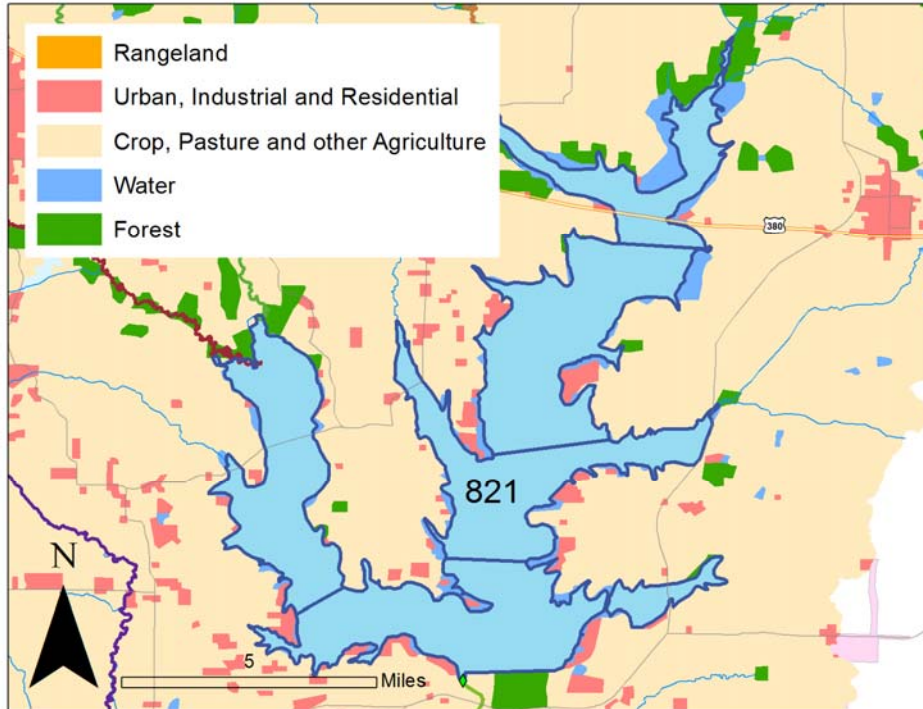
CS\*-Screening level concern carried forward from previous assessments

NS-Nonsupport

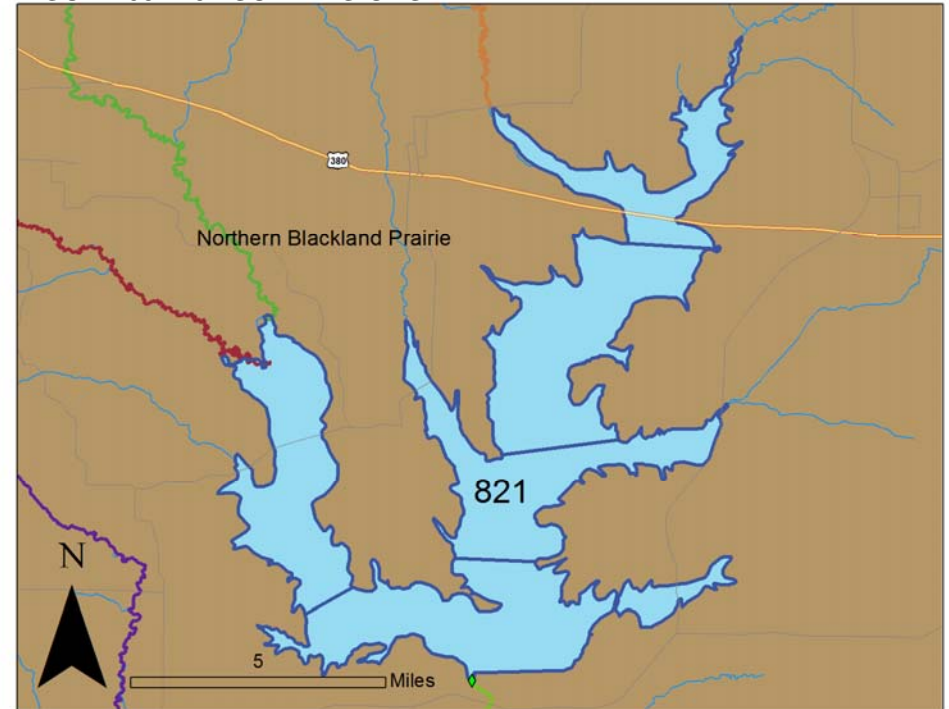
Impairment Category

5c-Additional data and information will be collected before a TMDL is scheduled

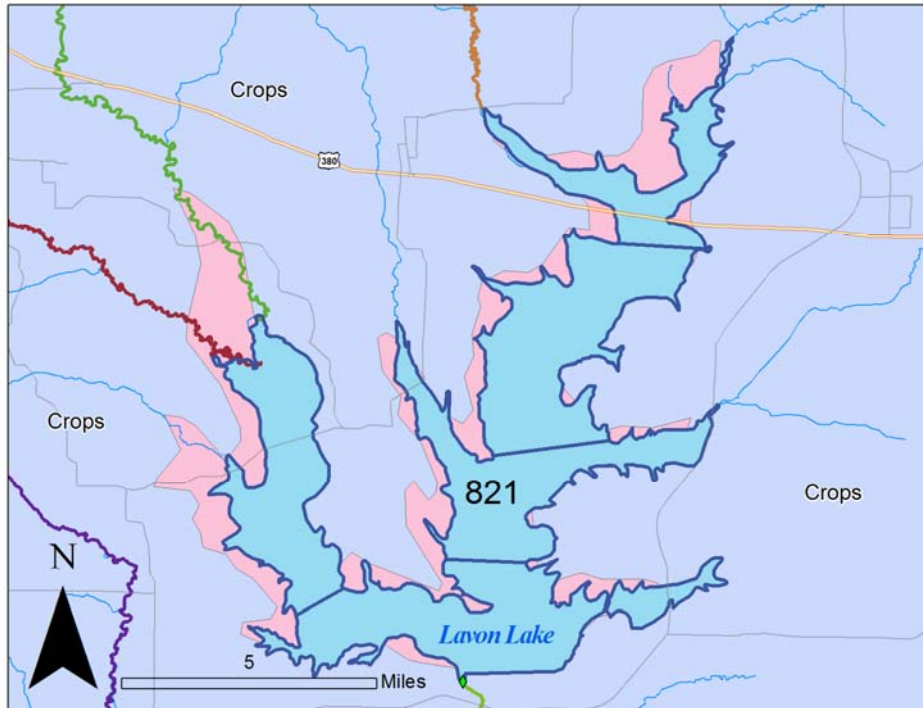
**FIGURE 0821.2: LAND COVER**



**FIGURE 0821.3: SOIL REGIONS**



**FIGURE 0821.4: VEGETATIVE PROVINCES**



**TABLE 0821.2: New and Renewed Discharge Permits**

Segment	Notice received by TRA on	Permittee/Facility	County	Permit Type	Action	Status	Permit Number
821	7/25/2012	ANNA, CITY OF	Collin	Water Quality	Renew al	Final	11283-001
821	7/17/2012	VAN ALSTYNE, CITY OF	Grayson	Water Quality	Renew al	Final	10502-001
821	7/17/2012	WALTON TEXAS, LP	Grayson	Water Quality	Renew al	Final	14835-001
821	6/11/2012	WYLIE NORTHEAST SUD - STP	Collin	Water Quality	Renew al	Final	14935-001
821	5/16/2012	LEONARD, CITY - STP	Fannin	Water Quality	Renew al	Final	10920-001
821	5/16/2012	EAST FORK PARTNERS, LLC	Collin	Water Quality	Renew al	Final	14998-001
821	4/26/2012	TIM BENNETT ENGINEERING & CONSTRUCTION - STP	Collin	Water Quality	Renew al	Final	14432-001
821	1/30/2012	LAKE LAVON BAPTIST ENCAMPMENT - STP	Collin	Water Quality	Renew al	Final	14192-001
821	1/9/2012	NTMWD - WILSON CR STP	Collin	Water Quality	Amendment	Final	12446-001



FIGURE 0821.5:



FIGURE 0821.6:



FIGURE 0821.7:



FIGURE 0821.8:



# East Fork Subwatershed

## 0820 – Lake Ray Hubbard

### SEGMENT DESCRIPTION

Segment 0820 begins at Rockwall-Forney Dam in Kaufman County and continues up to Lavon Dam in Collin County. It impounds the East Fork Trinity River up to the normal pool elevation of 435.5 feet. There are six assessment units in this segment. 0820\_01 is the lower portion of the East Fork arm, centering on IH 30. Sites in this assessment unit include 16809. 0820\_02 is the middle portion of the East Fork arm, centering on SH 66. Sites in this assessment unit include 16829. 0820\_03 is the remainder of segment. 0820\_04 is the lower portion of the main body of the reservoir extending up from the dam to Yankee Creek arm. Sites in this assessment unit include 10998 and 20194. 0820\_05 is the mid-reservoir I-30 crossing Rowlett Creek Arm to Yankee Creek Arm. Sites in this assessment unit include 17829. 0820\_06 is the outfall canal from Lake Lavon Dam. Sites in this assessment unit include 17846.

Unclassified water bodies in this segment include those listed below.

0820A—Cottonwood Creek—A perennial stream from the confluence with Rowlett Creek up to SH 5 near Greenville Road.

0820B—Rowlett Creek—A perennial stream from the normal pool elevation of 435.5 feet of Lake Ray Hubbard to the Parker Road crossing. This segment includes sites 10753 and 17845.

0820C—Muddy Creek—From the confluence with Lake Ray Hubbard in Dallas County up to the headwaters east of Allen in Collin County. This segment includes sites 16828 and 20110.

Figure 0820.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs). Table 0820.1 lists the stations being monitored in fiscal year 2014 as well as the parameters being collected and the frequency of sampling.

### HYDROLOGIC CHARACTERISTICS

Lake Ray Hubbard has a conservation pool elevation of 435.5 feet and is fed by the East Fork Trinity River. This reservoir is used for water supply and recreational activities. At the time of this writing, the reservoir has been below the conservation pool elevation by up to 7.17 feet since June 16, 2012.

### IMPAIRMENT/AREA OF INTEREST DESCRIPTION

Based on the 2012 Texas Water Quality Integrated Report, there are impairments in assessment units 0820\_01, 0820\_02, 0820\_04, 0820\_05, 0820B\_01, and 0820C\_01. Details of the assessment are located in Table 0820.2.

### LAND USE AND NATURAL CHARACTERISTICS

The land in this watershed is a mix of crop and urban development. The intense urban region of Dallas lies just to the west of 0820, with mainly crop land to the east.

This portion of the East Fork subwatershed is located within the Northern Blackland Prairie Ecoregion.

### POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST

It is possible that both the nutrient and Chlorophyll-a concerns in this segment are the result of the intense urban growth in the area that 0820 is near; possibly including runoff from construction, public and private landscaping and the runoff from fertilized cropland in the northern area of the region. E. coli in 0820B\_01 may be caused by runoff from stock animal waste from the crop and range land in the surrounding watershed, as well as urban runoff. This could also be the potential cause of the nutrient and dissolved oxygen concerns in 0820C\_01.

### POTENTIAL STAKEHOLDERS

Cities of Lavon, Dallas, Rockwall, Rowlett  
Lake Ray Hubbard Park Authorities

### RECOMMENDATIONS FOR IMPROVING WATER QUALITY

Water quality education  
Education of safe urban and farm fertilization practices  
Stream-friendly management of stock animal wastes  
Promotion of safe disposal of pet waste

### ONGOING PROJECTS

There are no ongoing projects in this segment.

### MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)

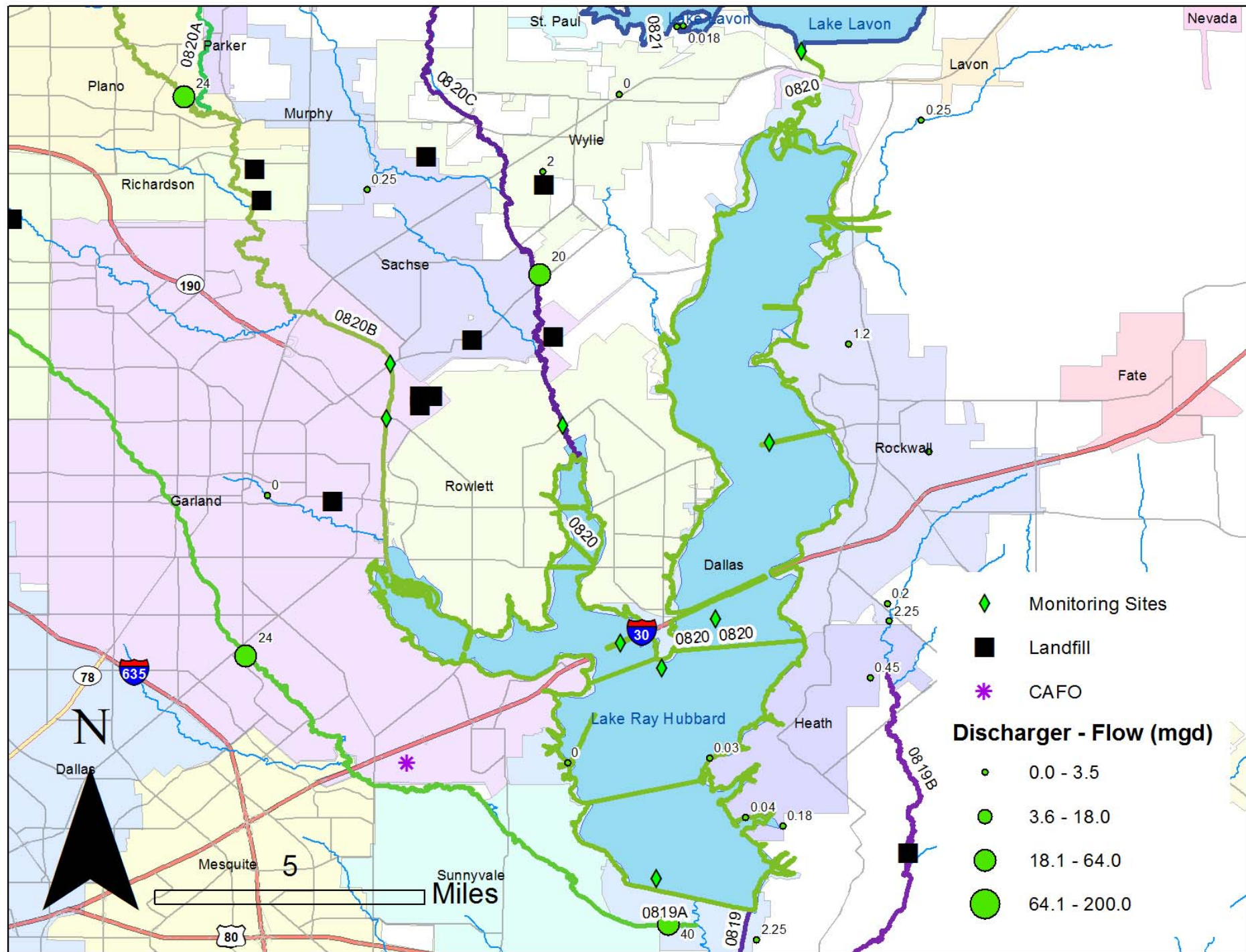
Zebra mussels were found in Lake Ray Hubbard in 2011. Due to their ability to reproduce quickly and filter large amounts of water, zebra mussels can dramatically change the food web of a reservoir. In addition, they selectively reject blue-green algae which can lead to blooms of these algae which are associated with taste and odor problems in finished drinking water. Two dischargers in 2012 and two in 2013 renewed their water quality permits. See Table 0820.3 for details.

### IMAGES

See Figures 0820.5 to 0820.8 for images of this segment.



FIGURE 0820.1





**TABLE 0820.1: Fiscal Year 2014 Monitoring**

Monitoring Entity	Segment	AU	Site ID	Site Description	Monitoring Type	24 Hour DO	Metals Water	Conventional	Bacteria	Flow	Field
Dallas	0820	0820_01	16809	LAKE RAY HUBBARD AT I 30 BRIDGE 766 METERS NORTH AND 1.26 KM EAST OF INTERSECTION OF CHAHA ROAD AND I 30 (H3)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0820	0820_02	16829	LAKE RAY HUBBARD EAST FORK ARM AT US 66 494 M NORTH AND 1.83 KM EAST OF INTERSECTION OF US 66 AND SCENIC DRIVE WEST OF ROCKWALL (H4)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0820	0820_04	10998	LAKE RAY HUBBARD 1.79 KM E AND 193 METERS S OF INTERSECT GLORIA RD AND E FORK RD NEAR DALLAS WATER INTAKE STRUCTURE AT WEST END OF DAM (H1)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0820	0820_05	17829	LAKE RAY HUBBARD MID LAKE 1.13 KM SOUTH AND 165 METERS EAST OF INTERSECTION OF DALROCK ROAD AND COOKE DRIVE (H2)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0820	0820_06	17846	LAKE RAY HUBBARD/EAST FORK TRINITY RIVER 200 METERS DOWNSTREAM OF LAKE LAVON OUTFALL AT COLLIN CR 384 (V1)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
TRA	0820B	0820B_01	10753	ROWLETT CREEK 75 METERS DOWNSTREAM OF SH 66 RIVER KM 1.7	RT		2 (Dissolved Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Nickel, Zinc)	4 (Hardness, NO2, NO2+NO3, NH3, TKN, TP, Chloride, Sulfate, Chlorophyll-a, TDS, OP)	4 (E. coli)	4	4 (Water Temp, Air Temp, Secchi Depth, Specific Conductance, DO, PH, Days Since Precipitation Event)
Dallas	0820B	0820B_01	21478	ROWLETT CREEK AT FIREWHEEL PARKWAY NEAR ROWLETT (H6)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)
Dallas	0820C	0820C_01	16828	MUDDY CREEK AT LIBERTY GROVE ROAD 0.65KM UPSTREAM OF LAKE RAY HUBBARD (H5)	RT		2 (Dissolved Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc, Selenium)				12 (Water Temp, Air Temp, Specific Conductance, DO, PH, Flow Severity, Days Since Precipitation Event)

**TABLE 0820.2: 2012 Water Quality Integrated Report**

Segment and Assessment Unit	Use	Method	Parameter Description	Criteria	Number of samples assessed	Number of samples exceed criteria	Mean of samples assessed (avg or geomean)	Mean of samples that exceed criteria	Dataset Qualifier	Impairment Level	Impairment Category
0820_01	General Use	Nutrient Screening Levels	Nitrate						ID	CS*	
0820_01	General Use	Nutrient Screening Levels	Chlorophyll-a						ID	CS*	
0820_02	General Use	Nutrient Screening Levels	Chlorophyll-a						ID	CS*	
0820_04	General Use	Nutrient Screening Levels	Nitrate	0.37	7	1		0.38	LD	CS	
0820_05	General Use	Nutrient Screening Levels	Nitrate						ID	CS*	
0820B_01	Recreation Use	Bacteria Geomean	E. coli	126	16	1	536.61		AD	CN	
0820B_01	General Use	Nutrient Screening Levels	Nitrate	1.95	16	12		4.34	AD	CS	
0820C_01	Aquatic Life Use	Dissolved Oxygen grab screening level	Dissolved Oxygen Grab	5	70	7		4.14	AD	CS	
0820C_01	General Use	Nutrient Screening Levels	Nitrate						ID	CS*	

Dataset Qualifier Codes

AD-Adequate Data (10 or more samples)

ID-Inadequate data (less than 4 samples)

LD-Limited Data (between 4 and 9 samples)

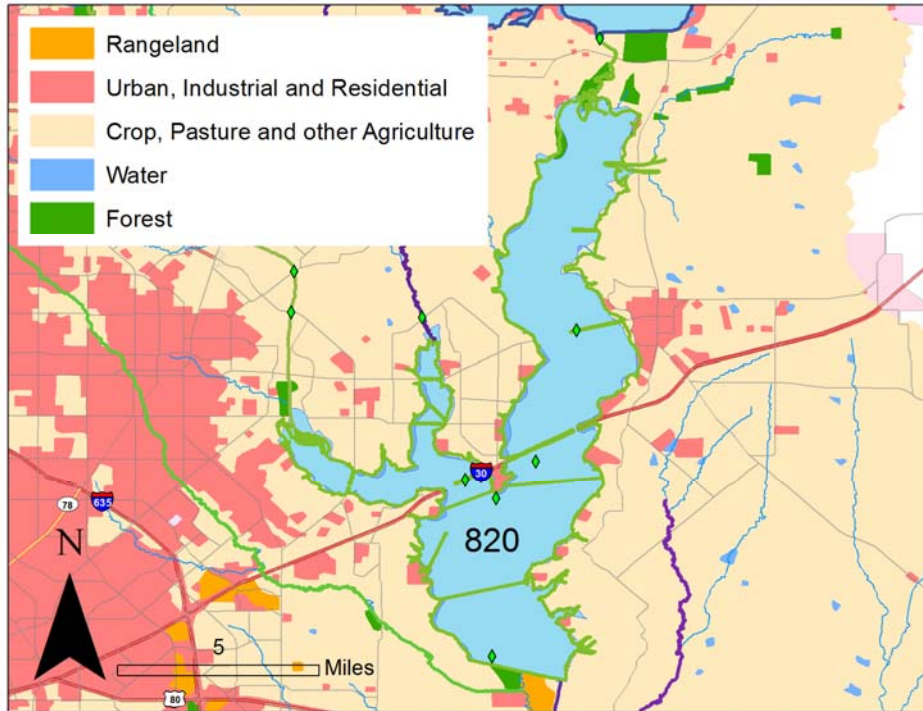
Impairment Level

CN-Use concern

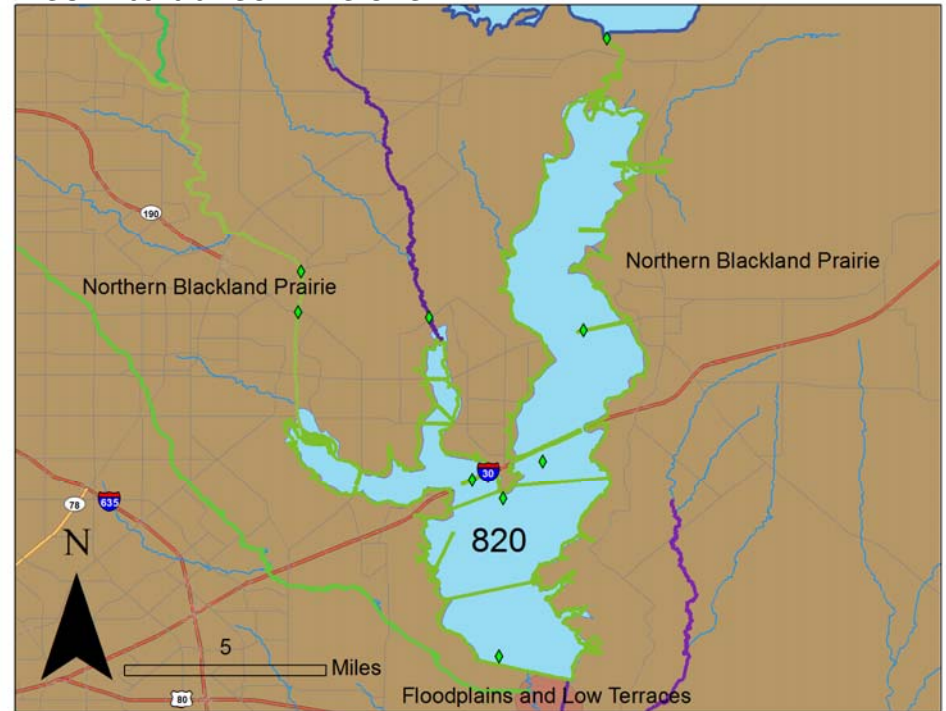
CS-Screening level concern

CS\*-Screening level concern carried forward from previous assessments

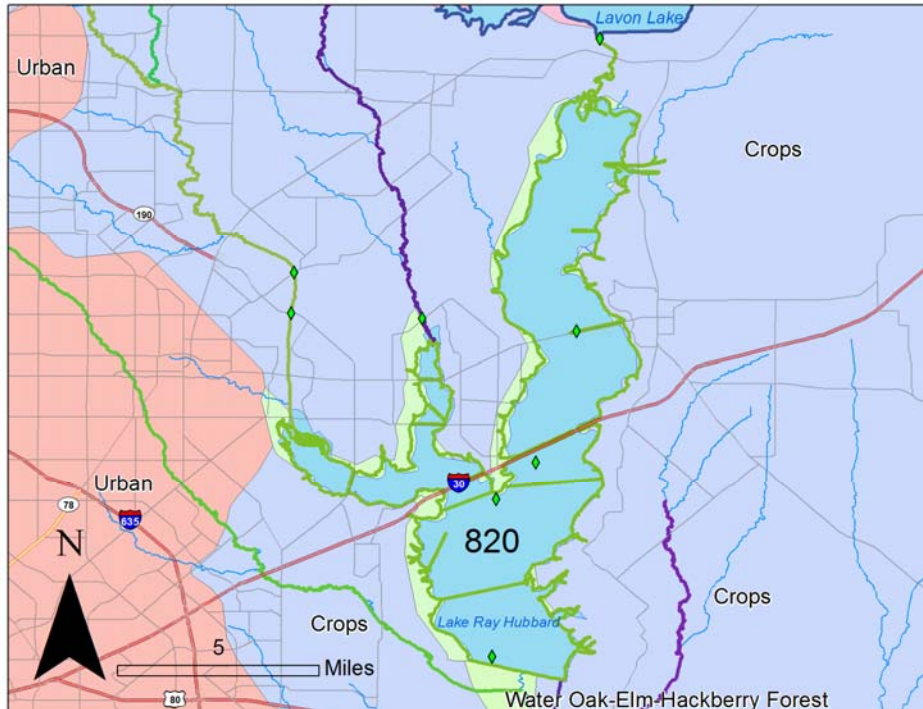
**FIGURE 0820.2: LAND COVER**



**FIGURE 0820.3: SOIL REGIONS**



**FIGURE 0820.4: VEGETATIVE PROVINCES**





**TABLE 0820.3: New and Renewed Discharge Permits**

Segment	Notice received by TRA on	Permitee/Facility	County	Permit Type	Action	Status	Permit Number
820	6/25/2013	City of Lavon	Collin	Water Quality	Renew al	Draft	14577-001
820	1/15/2013	NORTH TEXAS MUNICIPAL WATER DISTRICT	Collin	Water Quality	Renew al	Final	10363-001
820	12/26/2012	NORTH TEXAS MUNICIPAL WATER DISTRICT	Rockw all	Water Quality	Renew al	Final	10262-001
820	5/23/2012	NORTH TEXAS MUNICIPAL WATER DISTRICT	Dallas	Water Quality	Renew al	Final	14216-001

FIGURE 0820.5:



FIGURE 0820.6:



FIGURE 0820.7:



FIGURE 0820.8:



# East Fork Subwatershed

## 0819 – East Fork Trinity River

### SEGMENT DESCRIPTION

Segment 0819 begins at the confluence with the Trinity River in Kaufman County and continues up to Rockwall-Forney Dam in Kaufman County. There is one assessment unit in this segment, 0819\_01, that covers the entire segment. Sites in this assessment unit include 10987, 10990, 10991, 10992, 10996, 13612, 10993, 20286, 20285, 20284, 10989, and 10997.

Unclassified water bodies in this segment include those listed below.

0819A—Duck Creek—A perennial stream from the confluence with the East Fork Trinity River in Kaufman county to the confluence of an unnamed tributary 0.6 km upstream of Jupiter Road in Dallas County. This segment includes site 18558.

0819B—Buffalo Creek—A perennial stream from the confluence with the East Fork Trinity River up to 0.6 km above the confluence of Little Buffalo Creek. This segment includes sites 10824 and 18576.

Figure 0819.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs).

### HYDROLOGIC CHARACTERISTICS

The median annual flow of 0819 is 49.0 cubic feet per second (cfs) based on historic values at the USGS flow gage at East Fork Trinity River near Crandall (08062000). Over the past year, flow at the USGS gage decreased to a low flow of 16 cfs only once during the month of August 2013. There were six events in 2013 of flow values over 100 cfs, with May 2013 seeing a pulse of over 2000 cfs. Peak flows in this area of the East Fork generally returned to normal within two weeks.

### IMPAIRMENT/AREA OF INTEREST DESCRIPTION

Based on the 2012 Texas Water Quality Integrated Report, there are impairments in assessment units 0819\_01 and 0819B\_01. Details of the assessment are located in Table 0819.1.

### LAND USE AND NATURAL CHARACTERISTICS

Land cover in the 0819 watershed is a base of crop and agriculture land, with a large area of urban development to the west and northwest. A tract of forest riparian buffers the river nominally. 0819 is in the ecoregion category of floodplains and low terraces, and ,beyond that, is surrounded on all sides by the Northern Blackland Prairie.

### POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST

High nutrient levels in assessment units 0819\_01 and 0819B\_01 may be the result of the intense urban area of Dallas that 0819 flows near: possibly including runoff from construction and public and private landscaping. Also, the runoff from fertilized

cropland in the immediate floodplain and to the east might be contribution runoff from fertilizers and stock animal waste.

### POTENTIAL STAKEHOLDERS

Cities of Crandall, Dallas, Forney, Seagoville, Rosser

Bosque Utilities Corporation

Aqua Utilities

Land Advisors, LTD

### RECOMMENDATIONS FOR IMPROVING WATER QUALITY

Water quality education

Education of safe urban and farm fertilization practices

Stream-friendly management of stock animal wastes

Promotion of safe disposal of pet waste

### ONGOING PROJECTS

The post-diversion sampling phase of the North Texas Municipal Water East Fork Monitoring Program was completed in FY 2013. This project monitored water quality and biological populations in the river after the return flows from wastewater treatment plants were diverted. Data is currently being processed for inclusion in the statewide TCEQ database.

### MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)

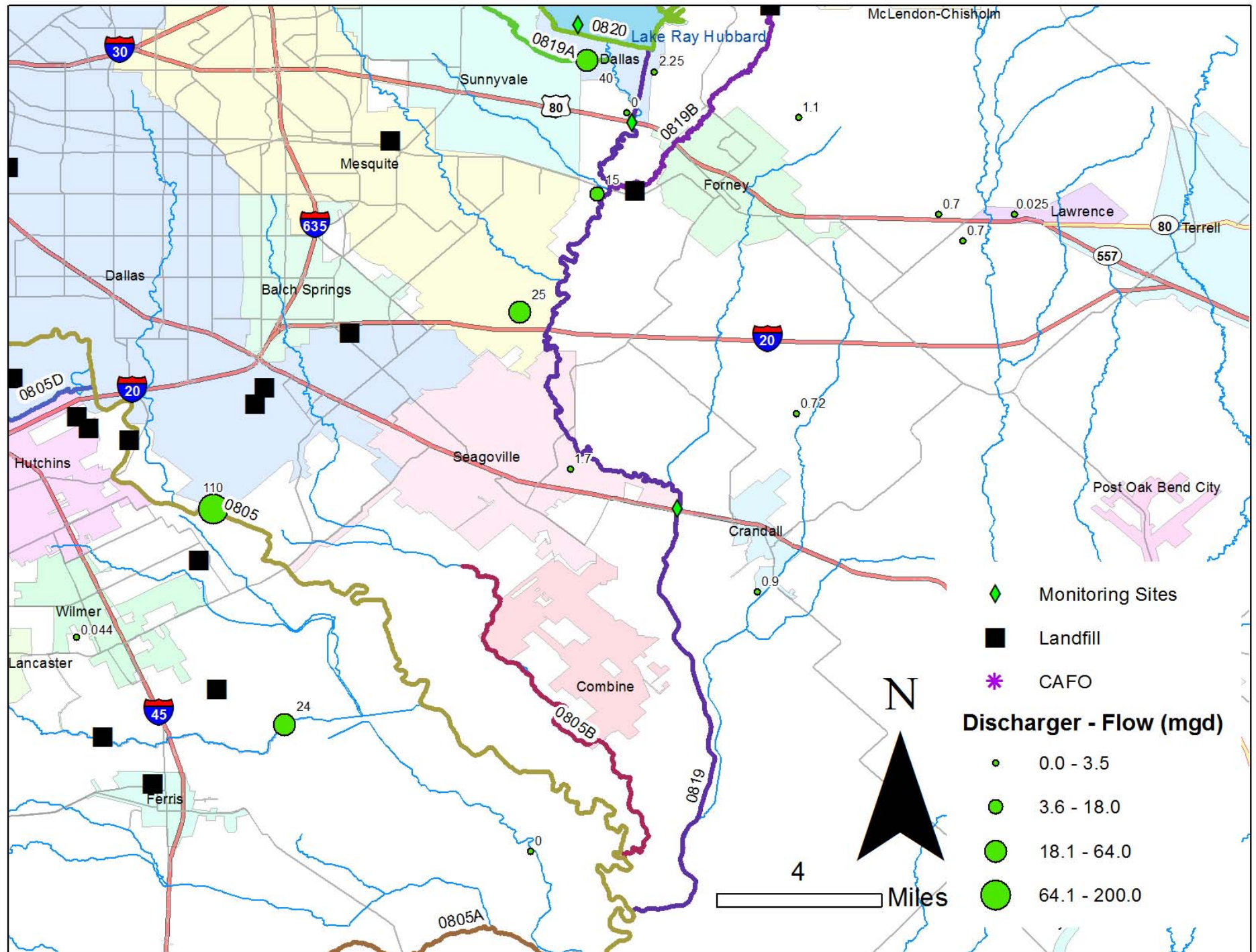
There are no known or anticipated events that would affect water quality in this segment. Four dischargers in 2012 and two in 2013 renewed their water quality permits. See Table 0819.2 for details.

### IMAGES

See Figures 0819.5 to 0819.8 for images of this segment.



FIGURE 0819.1



**TABLE 0819.1: 2012 Water Quality Integrated Report**

Segment and Assessment Unit	Use	Method	Parameter Description	Criteria	Number of samples assessed	Number of samples exceed criteria	Mean of samples assessed (avg or geomean)	Mean of samples that exceed criteria	Dataset Qualifier	Impairment Level	Impairment Category
0819_01	General Use	Dissolved Solids	Sulfate	100	75	1	126.59		AD	NS	5c
0819_01	General Use	Dissolved Solids	Total Dissolved Solids	500	86	1	545.84		AD	NS	5c
0819_01	General Use	Dissolved Solids	Chloride	100	75	1	104.47		AD	NS	5c
0819_01	General Use	Nutrient Screening Levels	Chlorophyll-a	14.1	89	29		21.62	AD	CS	
0819_01	General Use	Nutrient Screening Levels	Total Phosphorus	0.69	77	62		2.51	AD	CS	
0819_01	General Use	Nutrient Screening Levels	Ammonia	0.33	91	29		0.67	AD	CS	
0819_01	General Use	Nutrient Screening Levels	Nitrate	1.95	89	76		10.51	AD	CS	
0819_01	General Use	Nutrient Screening Levels	Orthophosphorus	0.37	80	69		2.08	AD	CS	
0819B_01	General Use	Nutrient Screening Levels	Nitrate	1.95	7	5		4.38	LD	CS	
0819B_01	General Use	Nutrient Screening Levels	Total Phosphorus	0.69	7	4		1.4	LD	CS	
0819B_01	General Use	Nutrient Screening Levels	Orthophosphorus	0.37	7	5		0.66	LD	CS	

Dataset Qualifier Codes

AD-Adequate Data (10 or more samples)

LD-Limited Data (between 4 and 9 samples)

Impairment Level

CS-Screening level concern

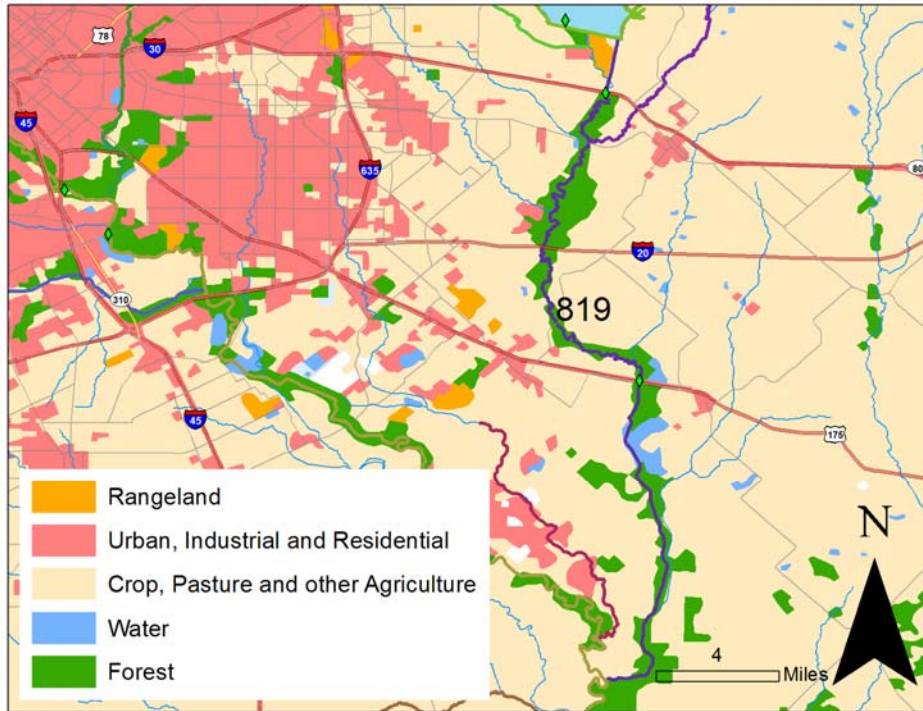
NS-Nonsupport

Impairment Category

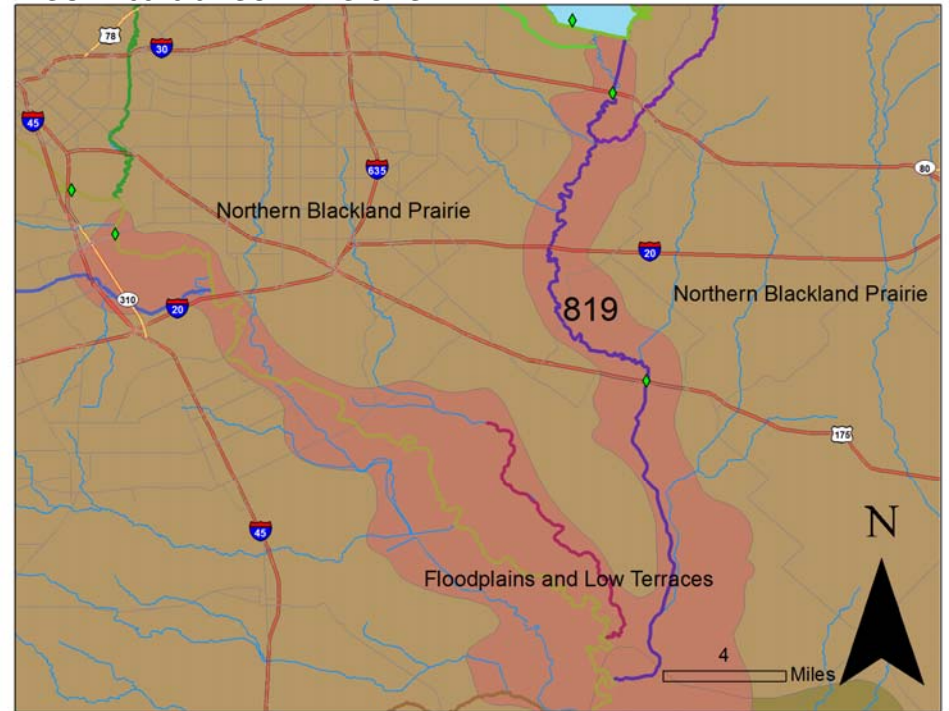
5c-Additional data and information will be collected before a TMDL is scheduled



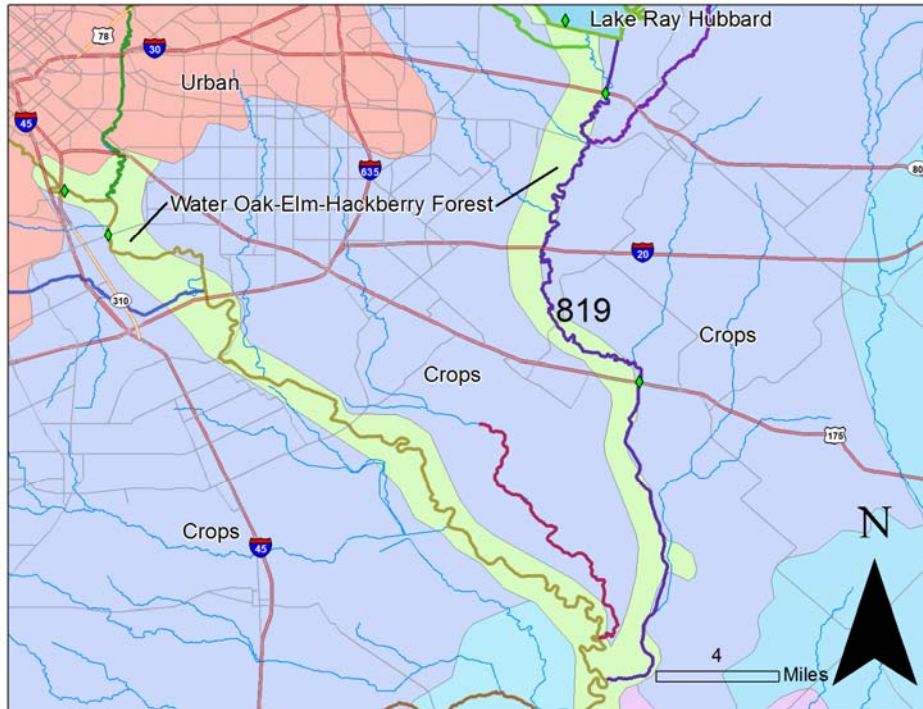
**FIGURE 0819.2: LAND COVER**



**FIGURE 0819.3: SOIL REGIONS**



**FIGURE 0819.4: VEGETATIVE PROVINCES**





**TABLE 0819.2: New and Renewed Discharge Permits**

Segment	Notice received by TRA on	Permittee/Facility	County	Permit Type	Action	Status	Permit Number
819	7/10/2013	Aqua Utilities	Rockwall	Water Quality	Renewal	Final	11974-001
819	6/10/2013	Bosque Utilities Corporation	Kaufman	Water Quality	Renewal	Draft	14627-001
819	12/26/2012	NORTH TEXAS MUNICIPAL WATER DISTRICT	Rockwall	Water Quality	Renewal	Final	12047-001
819	11/7/2012	CRANDALL, CITY - STP	Kaufman	Water Quality	Renewal	Final	10834-001
819	9/27/2012	LAND ADVISORS, LTD - STP	Kaufman	Water Quality	Renewal	Final	14719-001
819	3/16/2012	NTMWD - MESQ CR STP	Dallas	Water Quality	Renewal	Final	10221-001

**FIGURE 0819.5:**



**FIGURE 0819.6:**



**FIGURE 0819.7:**

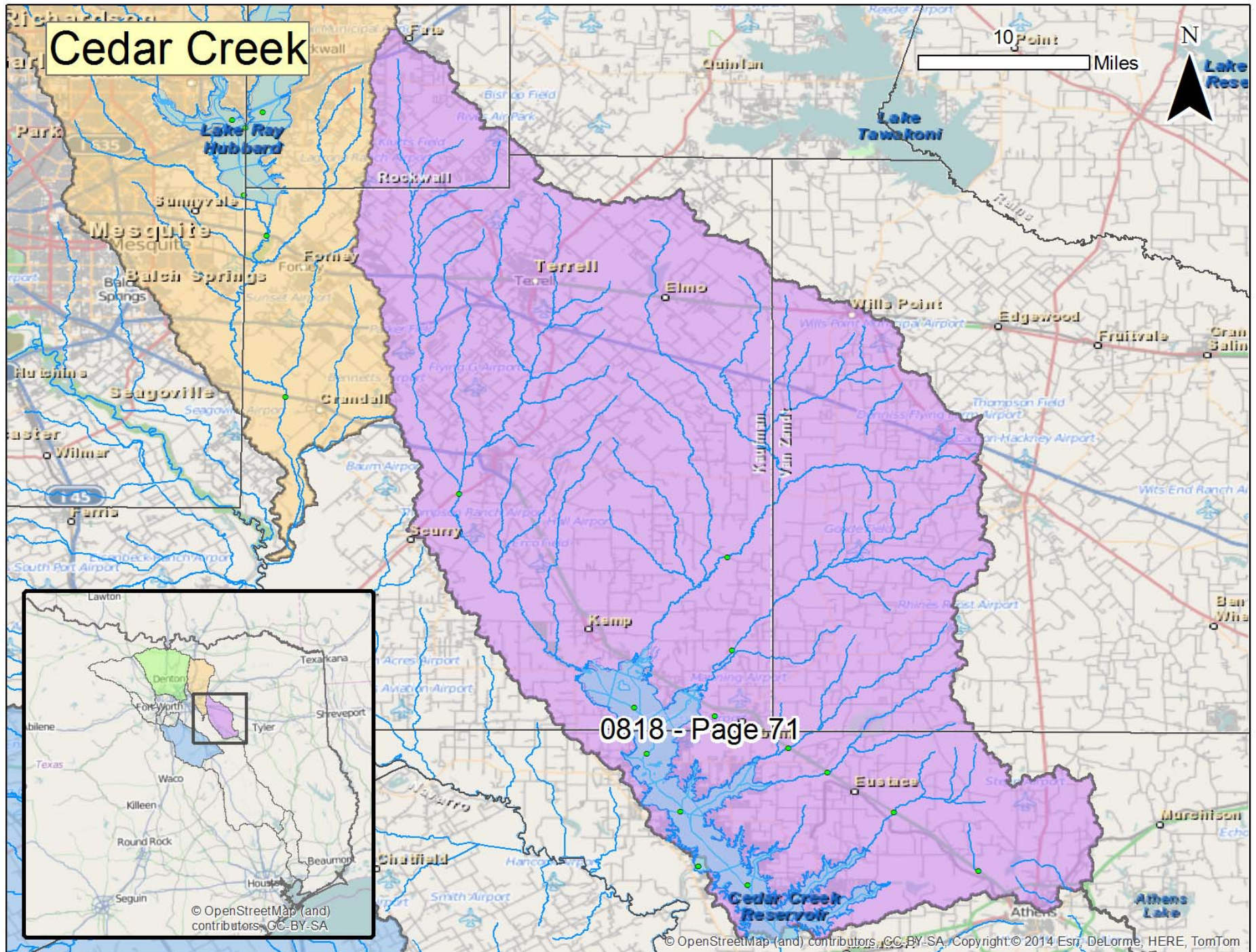


**FIGURE 0819.8:**





# Cedar Creek





# Cedar Creek Subwatershed

## 0818 – Cedar Creek Reservoir

### SEGMENT DESCRIPTION

Segment 0818 begins at Joe B. Hoggsett Dam in Henderson County and continues up to the normal pool elevation of 322 feet, impounding Cedar Creek. There are 14 assessment units in this segment. 0818\_01 is the lowermost portion of the reservoir, adjacent to the dam. Sites in this assessment unit include 13845, 16745, and 16748. 0818\_02 is Caney Creek cove. Sites in this assessment unit include 16744. 0818\_03 is Clear Creek cove. Sites in this assessment unit include 16743. 0818\_04 is the lower portion of the reservoir east of Key Ranch Estates. Sites in this assessment unit include 13848 and 16749. 0818\_05 is the cove off the lower portion of the reservoir adjacent to Clearview Estates. Sites in this assessment unit include 16746. 0818\_06 is the middle portion of the reservoir downstream of Twin Creeks cove. Sites in this assessment unit include 15812, 16741, 16747, 16750, 17090, 18472, and 18473. 0818\_07 is Twin Creeks cove. Sites in this assessment unit include 16739. 0818\_08 is Prairie Creek cove. Sites in this assessment unit include 16751 and 16752. 0818\_09 is the upper portion of the reservoir adjacent to Lacy Fork cove. Sites in this assessment unit include 13854, 16753, and 18471. 0818\_10 is Lacy Fork cove. Sites in this assessment unit include 16771. 0818\_11 is the upper portion of the reservoir east of Tolosa. Sites in this assessment unit include 16772. 0818\_12 is the uppermost portion of the reservoir downstream of Kings Creek. Sites in this assessment unit include 16774, 18469, and 18470. 0818\_13 is Cedar Creek cove. Sites in this assessment unit include 16773. 0818\_14 is the remainder of reservoir.

Unclassified water bodies in this segment include those listed below.

0818A—One Mile Creek—A perennial stream from the confluence with Valley View Reservoir upstream to the confluence with an unnamed tributary 0.8 km upstream of SH 19.

Figure 0818.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs). Table 0818.1 lists the stations being monitored in fiscal year 2014 as well as the parameters being collected and the frequency of sampling.

### HYDROLOGIC CHARACTERISTICS

Cedar Creek Reservoir has a conservation pool elevation of 322 feet and is fed by Cedar Creek. This reservoir is used for water supply and recreational activities. At the time of this writing, the reservoir has been below the conservation pool elevation by up to 6.73 feet since April 21, 2012.

### IMPAIRMENT/AREA OF INTEREST DESCRIPTION

Based on the 2012 Texas Water Quality Integrated Report, there are impairments in assessment units 0818\_01, 0818\_02, 0818\_03, 0818\_04, 0818\_05, 0818\_06, 0818\_07, 0818\_08, 0818\_09, 0818\_10, 0818\_11, 0818\_12, 0818\_13. Details of the

assessment are located in Table 0818.2.

### LAND USE AND NATURAL CHARACTERISTICS

Land cover in the 0819 area is a base of mainly crop and agriculture land, with a large area of urban development to the west and northwest. There is also a relative abundance of forest class land cover near the Lake, particularly near the southern end of Cedar Creek. 0818 is entirely in the Northern Post Oak Savanna ecoregion, but is very near the Northern Blackland Prairie to the North and the Flood plains and Low Terraces to the South.

### POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST

A likely cause of elevated nutrients throughout 0818 is the runoff from fertilized cropland in the immediate floodplain and the contribution runoff from fertilizers and stock animal waste. These nutrients may lead to the growth of chlorophyll-a (algae), seen in 0818. High (basic) pH in much of 0818 might be a result excessive amounts of photosynthetically active algae and macrophytes which can increase consumption of carbon dioxide during the day; increasing pH in the water column.

### POTENTIAL STAKEHOLDERS

Cities of Dallas, Kemp, Wills Point, Terrell, Athens, Eustace, Kaufman  
Sentry Title Co.

Omega Healthcare Investors

Monarch Utilities ILP

### RECOMMENDATIONS FOR IMPROVING WATER QUALITY

Water quality education

Education of safe urban and farm fertilization practices

Stream-friendly management of stock animal wastes

Promotion of safe disposal of pet waste

### ONGOING PROJECTS

The Agricultural Non-Point Source Remediation in the Cedar Creek Reservoir Watershed project is ongoing in this segment. This project's goal is to reduce nutrient and sediment loading into the reservoir through the use of Best Management Practices on surrounding agricultural lands. Currently, there are agreements in place with the Kaufman-VanZandt Soil and Water Conservation District (SWCD) and Texas AgriLife Extension provide for matching funds. The SWCD will provide matching funds for Water Quality Management Plans while the Extension will provide public outreach and education assistance.

### MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)

There are no known or anticipated events that would affect water quality in this segment. Eight dischargers in 2012 and four in 2013 renewed their water quality permits. See Table 0818.3 for details.

### IMAGES

See Figures 0818.5 to 0818.8 for images of this segment.

**Monitoring Sites**

**CAFO**

**Landfill**

**Discharger - Flow (mgd)**

- 0.0 - 3.5
- 3.6 - 18.0
- 18.1 - 64.0
- 64.1 - 200.0

Map labels: Kemp, Mabank, Gun Barrel City, Eustace, Payne Springs, Enchanted Oaks, Log Cabin, Caney City, Star Harbor, Malakoff, Trinidad, Kerens, Athens.

Scale: 5 Miles

North Arrow: N

**TABLE 0818.1: Fiscal Year 2014 Monitoring**

Monitoring Entity	Segment	AU	Site ID	Site Description	Monitoring Type	24 Hour DO	Metals Water	Conventional	Bacteria	Flow	Field
TRWD	0818	0818_01	16748	CEDAR CREEK RESERVOIR 710 MW AND 1.01 MW OF INTERSECTION OF WOODLAWN WAY AND SUNSET BLVD AT CONFLUENCE OF CANEY CK AND CLEAR CK COVES	RT			5 (Total Alkalinity, TSS, NH3, TKN, NO2+NO3, TP, TOC, DOC, Chloride, Chlorophyll-a, TDS, OP)	4 (E. coli)		5 (Water Temp, Secchi Depth, Specific Conductance, DO, pH)
TRWD	0818	0818_04	16749	CEDAR CREEK RESERVOIR 1.01 KM SOUTH AND 1.34 KM WEST OF INTERSECTION OF CAROLYNN ROAD AND OAKVIEW TRAIL	RT			5 (Total Alkalinity, TSS, NH3, TKN, NO2+NO3, TP, TOC, DOC, Chloride, Chlorophyll-a, TDS, OP)	4 (E. coli)		5 (Water Temp, Secchi Depth, Specific Conductance, DO, pH)
TRWD	0818	0818_06	16747	CEDAR CREEK RESERVOIR 12 METERS NORTH AND 586 METERS EAST OF INTERSECTION OF ASHBY LANE AND BURLEY LOOP	BS	2					
TRWD	0818	0818_06	16747	CEDAR CREEK RESERVOIR 12 METERS NORTH AND 586 METERS EAST OF INTERSECTION OF ASHBY LANE AND BURLEY LOOP	RT		12 (Total Calcium, Magnesium, Sodium, Potassium, Arsenic, Iron, Manganese)	12 (Total Alkalinity, TSS, NH3, TKN, NO2+NO3, TP, TOC, DOC, Chloride, Sulfate, Chlorophyll-a, TDS, OP, Phytoplankton)	4 (E. coli)		12 (Water Temp, Secchi Depth, Specific Conductance, DO, pH)
TRWD	0818	0818_09	16753	CEDAR CREEK RESERVOIR 1.42 KM NORTH AND 1.37 KM EAST OF INTERSECTION OF NOB HILL ROAD AND SH 334	RT			5 (Total Alkalinity, TSS, NH3, TKN, NO2+NO3, TP, TOC, DOC, Chloride, Chlorophyll-a, TDS, OP)	4 (E. coli)		5 (Water Temp, Secchi Depth, Specific Conductance, DO, pH)
TRWD	0818	0818_11	16772	CEDAR CREEK RESERVOIR NORTH MID LAKE 800 M NORTH AND 2.59 KM EAST OF INTERSECTION OF KAUFMAN CR 4042 AND KAUFMAN CR 4043	RT			5 (Total Alkalinity, TSS, NH3, TKN, NO2+NO3, TP, TOC, DOC, Chloride, Chlorophyll-a, TDS, OP)	4 (E. coli)		5 (Water Temp, Secchi Depth, Specific Conductance, DO, pH)
TRWD	0818	0818_14	21427	CEDAR CREEK RESERVOIR 1.07 KM EAST AND 40 METERS NORTH OF THE INNER CIRCLE UPPER CHANNEL NEAR INTERSECTION OF HEATHER WOODS DRIVE AND LEISA PLACE IN THE CITY OF TOOL	RT			5 (Total Alkalinity, TSS, NH3, TKN, NO2+NO3, TP, TOC, DOC, Chloride, Chlorophyll-a, TDS, OP)	4 (E. coli)		5 (Water Temp, Secchi Depth, Specific Conductance, DO, pH)
TRWD	0818		16755	CLEAR CREEK AT US 175 4.3 KM UPSTREAM OF CEDAR CREEK RESERVOIR	RT		12 (Total Arsenic)	12 (TSS, NH3, TKN, NO2+NO3, TP, TOC, Chloride, OP)	12 (E. coli)		12 (Water Temp, Specific Conductance, DO, pH, Flow Severity)
TRWD	0818		16756	NORTH TWIN CREEK AT US 175 3.3KM UPSTREAM OF CEDAR CREEK RESERVOIR	RT		12 (Total Arsenic)	12 (TSS, NH3, TKN, NO2+NO3, TP, TOC, Chloride, OP)	12 (E. coli)		12 (Water Temp, Specific Conductance, DO, pH, Flow Severity)
TRWD	0818		16757	SOUTH TWIN CREEK AT US 175 5.0KM UPSTREAM OF CEDAR CREEK RESERVOIR	RT		12 (Total Arsenic)	12 (TSS, NH3, TKN, NO2+NO3, TP, TOC, Chloride, OP)	12 (E. coli)		12 (Water Temp, Specific Conductance, DO, pH, Flow Severity)



**TABLE 0818.1 Continued: Fiscal Year 2014 Monitoring**

Monitoring Entity	Segment	AU	Site ID	Site Description	Monitoring Type	24 Hour DO	Metals Water	Conventional	Bacteria	Flow	Field
TRWD	0818		16758	CANEY CREEK AT US 175 8.4KM UPSTREAM OF CEDAR CREEK RESERVOIR NORTHWEST OF ATHENS	RT		12 (Total Arsenic)	12 (TSS, NH3, TKN, NO2+NO3, TP, TOC, Chloride, OP)	12 (E. coli)		12 (Water Temp, Specific Conductance, DO, pH, Flow Severity)
TRWD	0818		16775	PRAIRIE CREEK AT KAUFMAN CR 4006/RODEO ROAD 5.7 KM UPSTREAM OF CEDAR CREEK RESERVOIR WEST OF MABANK	RT		12 (Total Arsenic)	12 (TSS, NH3, TKN, NO2+NO3, TP, TOC, Chloride, OP)	12 (E. coli)		12 (Water Temp, Specific Conductance, DO, pH, Flow Severity)
TRWD	0818		16777	LACY FORK CREEK 25 METERS UPSTREAM OF FM 90 5.9KM UPSTREAM OF CEDAR CREEK RESERVOIR	RT		12 (Total Arsenic)	12 (TSS, NH3, TKN, NO2+NO3, TP, TOC, Chloride, OP)	12 (E. coli)		12 (Water Temp, Specific Conductance, DO, pH, Flow Severity)
TRWD	0818		17842	CEDAR CREEK AT FM 243 SOUTHEAST OF CEDARVALE	RT		12 (Total Arsenic)	12 (TSS, NH3, TKN, NO2+NO3, TP, TOC, Chloride, OP)	12 (E. coli)	12	12 (Water Temp, Specific Conductance, DO, pH, Flow Severity)
TRWD	0818		21000	Kings Creek at SH34 upstream of Cedar Creek Reservoir southw est of Kaufman 3.44 km southw est on SH34 from US175	RT		12 (Total Arsenic)	12 (TSS, NH3, TKN, NO2+NO3, TP, TOC, Chloride, OP)	12 (E. coli)	12	12 (Water Temp, Specific Conductance, DO, pH, Flow Severity)

**TABLE 0818.2: 2012 Water Quality Integrated Report**

Segment and Assessment Unit	Use	Method	Parameter Description	Criteria	Number of samples assessed	Number of samples exceed criteria	Mean of samples assessed (avg or geomean)	Mean of samples that exceed criteria	Dataset Qualifier	Impairment Level	Impairment Category
0818_01	General Use	High pH	pH	8.5	40	13		8.93	AD	NS	5c
0818_01	General Use	Nutrient Screening Levels	Chlorophyll-a	26.7	28	12		35.29	AD	CS	
0818_02	General Use	High pH	pH						ID	NS*	5c
0818_02	General Use	Nutrient Screening Levels	Ammonia						ID	CS*	
0818_03	General Use	High pH	pH						ID	NS*	5c
0818_04	General Use	High pH	pH	8.5	37	8		9.02	AD	NS	5c
0818_04	General Use	Nutrient Screening Levels	Chlorophyll-a	26.7	28	14		35.66	AD	CS	
0818_05	General Use	High pH	pH						ID	NS*	5c
0818_05	General Use	Nutrient Screening Levels	Ammonia						ID	CS*	
0818_06	General Use	High pH	pH	8.5	122	36		8.99	AD	NS	5c
0818_06	General Use	Nutrient Screening Levels	Chlorophyll-a	26.7	57	36		43.56	AD	CS	
0818_07	General Use	High pH	pH						ID	NS*	5c
0818_08	General Use	High pH	pH	8.5	19	13		8.89	AD	NS	5c
0818_08	General Use	Nutrient Screening Levels	Ammonia						ID	CS*	
0818_08	General Use	Nutrient Screening Levels	Chlorophyll-a						ID	CS*	
0818_09	General Use	High pH	pH	8.5	40	18		9.1	AD	NS	5c
0818_09	General Use	Nutrient Screening Levels	Chlorophyll-a	26.7	29	19		49.32	AD	CS	
0818_10	General Use	Nutrient Screening Levels	Chlorophyll-a						ID	CS*	
0818_11	General Use	High pH	pH	8.5	37	16		9.12	AD	NS	5c
0818_11	General Use	Nutrient Screening Levels	Chlorophyll-a	26.7	10	4		40.83	AD	CS	
0818_12	General Use	High pH	pH	8.5	7	6		9.46	LD	NS	5c
0818_13	Aquatic Life Use	Dissolved Oxygen grab screening level	Dissolved Oxygen Grab						ID	CS*	
0818_13	General Use	Nutrient Screening Levels	Orthophosphorus						ID	CS*	
0818_13	General Use	Nutrient Screening Levels	Ammonia						ID	CS*	
0818_13	General Use	Nutrient Screening Levels	Total Phosphorus						ID	CS*	
0818_13	General Use	Nutrient Screening Levels	Chlorophyll-a						ID	CS*	

**Dataset Qualifier Codes**

AD-Adequate Data (10 or more samples)  
ID-Inadequate data (less than 4 samples)  
LD-Limited Data (between 4 and 9 samples)

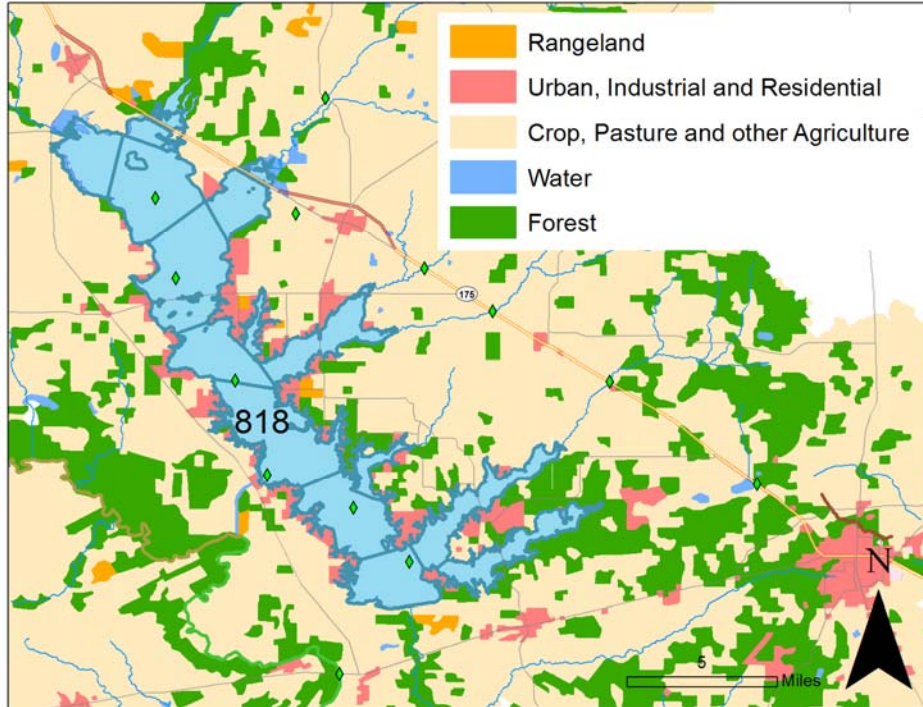
**Impairment Level**

CS-Screening level concern  
CS\*-Screening level concern carried forward from previous assessments  
NS-Nonsupport  
NS\*-Nonsupport carried forward from previous assessments

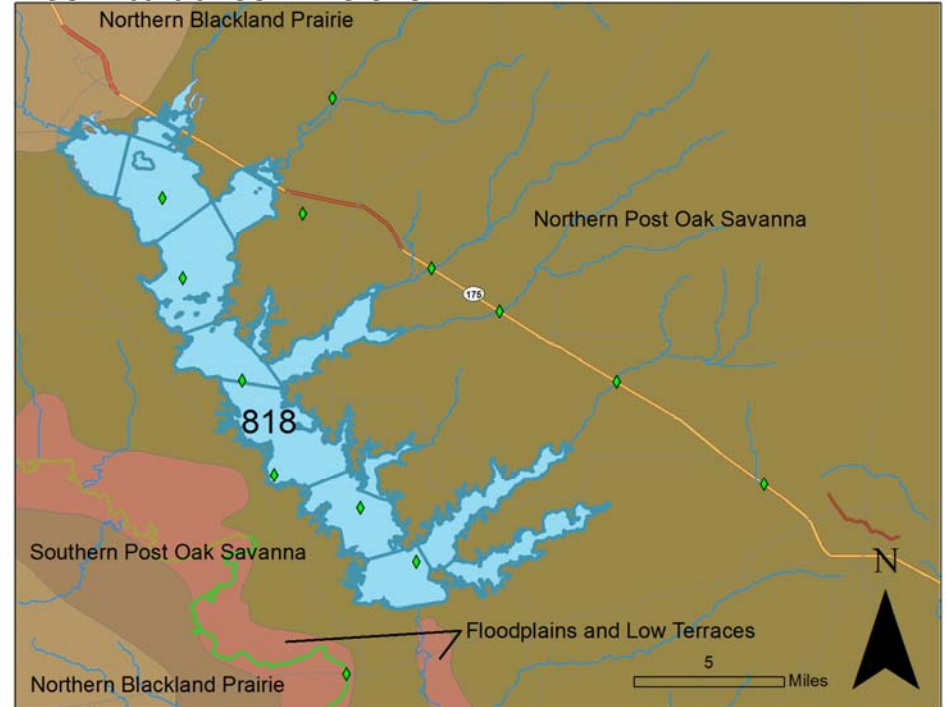
**Impairment Category**

5c-Additional data and information will be collected before a TMDL is scheduled

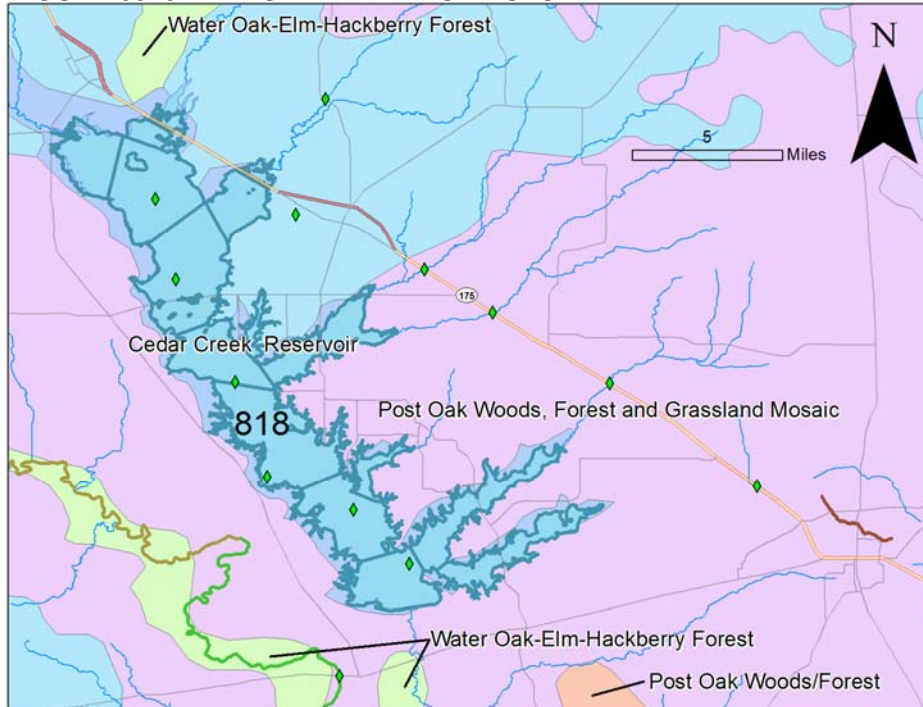
**FIGURE 0818.2: LAND COVER**



**FIGURE 0818.3: SOIL REGIONS**



**FIGURE 0818.4: VEGETATIVE PROVINCES**





**TABLE 0818.3: New and Renewed Discharge Permits**

Segment	Notice received by TRA on	Permitee/Facility	County	Permit Type	Action	Status	Permit Number
818	4/26/2013	City of Wills Point	VAN	Water Quality	Renew al	Final	14834-001
818	4/16/2013	KEMP, CITY - STP	Kaufman	Water Quality	Renew al	Final	10695-001
818	1/15/2013	TERRELL, CITY - KINGS CR STP	Kaufman	Water Quality	Renew al	Final	10747-001
818	1/15/2013	SENTRY TITLE CO, INC. - STP	Henderson	Water Quality	Renew al	Final	14845-001
818	8/13/2012	OMEGA HEALTHCARE INVESTORS	Henderson	Water Quality	Renew al	Final	14329-001
818	4/10/2012	ATHENS, CITY - N STP	Henderson	Water Quality	Renew al	Final	10143-001
818	3/29/2012	CHHOTUBHAI THAKORBHAI PATEL - STP	Kaufman	Water Quality	Renew al	Final	11286-001
818	3/29/2012	MONARCH UTILITIES I L.P. - STP	Henderson	Water Quality	Renew al	Final	11506-001
818	3/29/2012	MONARCH UTILITIES I LP - CHEROKEE SHORES STP	Henderson	Water Quality	Renew al	Final	13879-001
818	3/29/2012	EUSTACE, CITY - STP	Henderson	Water Quality	Renew al	Final	14789-001
818	3/16/2012	NEAL & FM 548-1076 LLP - STP	Kaufman	Water Quality	Renew al	Final	14858-001
818	1/30/2012	KAUFMAN, CITY - STP	Kaufman	Water Quality	Renew al	Final	12114-001

**FIGURE 0818.5:**



**FIGURE 0818.6:**



**FIGURE 0818.7:**

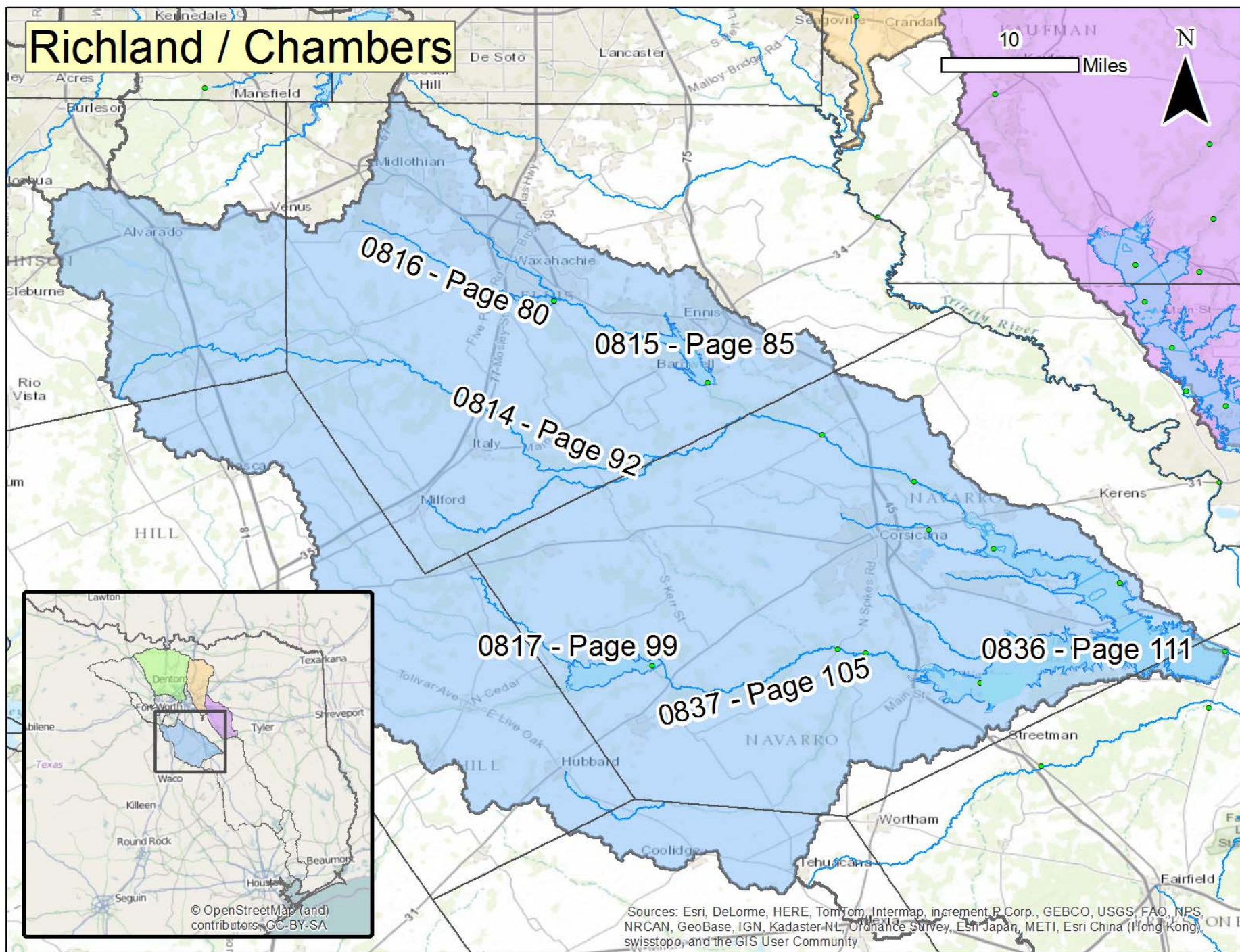


**FIGURE 0818.8:**





# Richland / Chambers





# Richland Chambers Subwatershed

## 0816 – Lake Waxahachie

### SEGMENT DESCRIPTION

Segment 0816 begins at South Prong Dam in Ellis County and continues up to the normal pool elevation of 531.5 feet, impounding South Prong Creek. There is one assessment unit in this segment, 0816\_01, that covers the entire reservoir. Sites in this assessment unit include 10980.

Unclassified water bodies in this segment include those listed below.

0816A—South Prong Creek—A 12.2 mile stretch of South Prong Creek running upstream from the confluence with Segment 0816 (Lake Waxahachie) up to the upper end of the creek in Midlothian in Ellis County. This segment includes site 18571.

Figure 0816.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs). Table 0816.1 lists the stations being monitored in fiscal year 2014 as well as the parameters being collected and the frequency of sampling.

### HYDROLOGIC CHARACTERISTICS

Lake Waxahachie has a conservation pool elevation of 531 feet and is fed by South Prong Creek. This reservoir is used for water supply and recreational activities. At the time of this writing, the reservoir has been below the conservation pool elevation by up to 5.04 feet since May 25, 2012.

### IMPAIRMENT/AREA OF INTEREST DESCRIPTION

There are no impairments or concerns in this segment.

### LAND USE AND NATURAL CHARACTERISTICS

This segment and its watershed are entirely within the Northern Blackland Prairie ecoregion with the land use being nearly all classified as agriculture and pasture. There is some urbanization to the north of the lake in the City of Waxahachie.

### POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST

There are no impairments or concerns in this segment.

### POTENTIAL STAKEHOLDERS

City of Waxahachie  
Tarrant Regional Water District

### RECOMMENDATIONS FOR IMPROVING WATER QUALITY

There are no impairments or concerns in this segment.

### ONGOING PROJECTS

There are no ongoing projects in this segment.

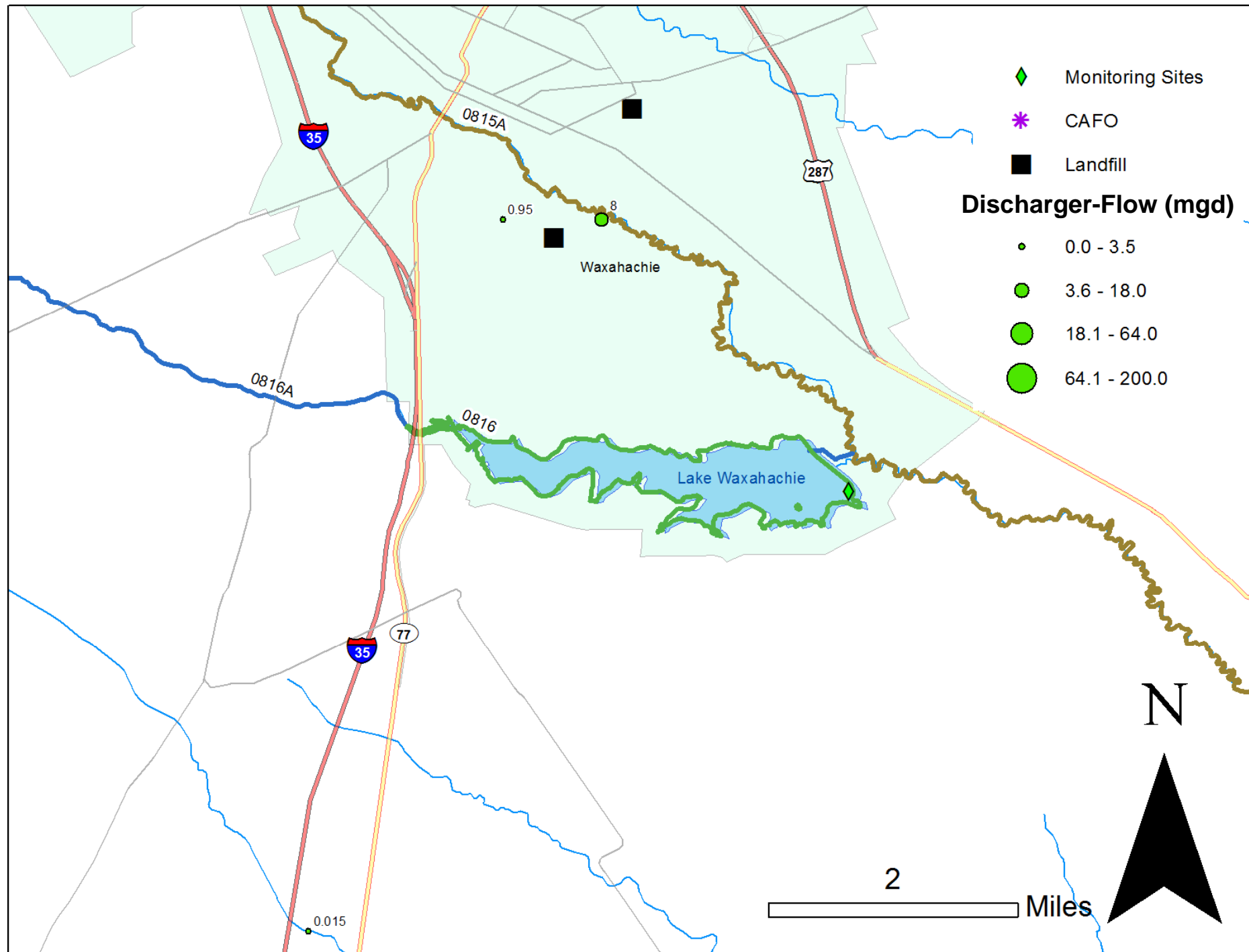
### MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)

There are no known or anticipated events that would affect water quality in this segment.

### IMAGES

See Figures 0816.5 to 0816.8 for images of this segment.

FIGURE 0816.1

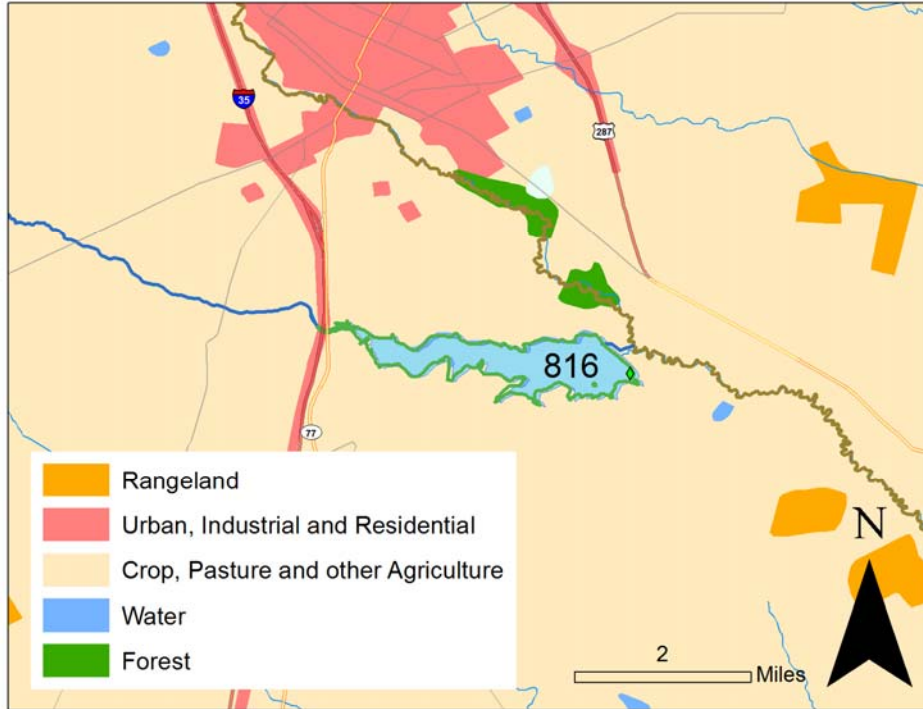


**TABLE 0816.1: Fiscal Year 2014 Monitoring**

Monitoring Entity	Segment	AU	Site ID	Site Description	Monitoring Type	24 Hour DO	Metals Water	Conventional	Bacteria	Flow	Field
TRA	0816	0816_01	10980	LAKE WAXAHACHIE 474 METERS NORTH AND 143 METERS EAST OF INTERSECTION OF OLD HOWARD LANE AND PENN ROAD MID LAKE NEAR DAM	RT			4 (Total Alkalinity, TSS, VSS, NH3, TKN, TP, TOC, Chloride, Sulfate, Fluoride, Chlorophyll-a, Pheophytin-a TDS, OP)	4 (E. coli)		4 (Water Temp, Air Temp, Secchi Depth, Specific Conductance, DO, PH, Days Since Precipitation Event)



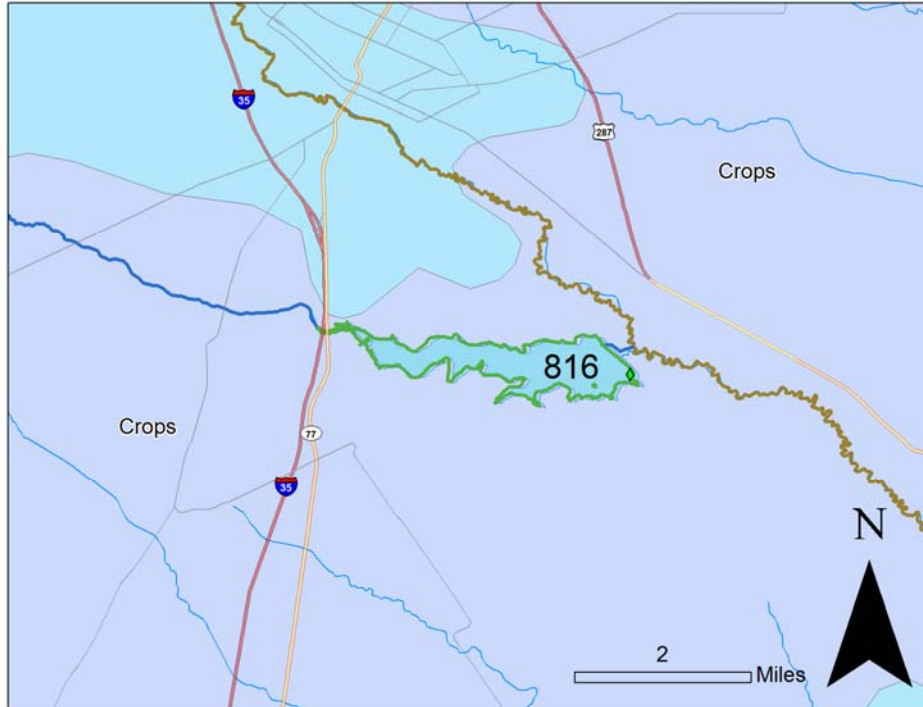
**FIGURE 0816.2: LAND COVER**



**FIGURE 0816.3: SOIL REGIONS**



**FIGURE 0816.4: VEGETATIVE PROVINCES**



**FIGURE 0816.5:**



**FIGURE 0816.6:**



**FIGURE 0816.7:**



**FIGURE 0816.8:**



# Richland Chambers Subwatershed

## 0815 – Bardwell Reservoir

### SEGMENT DESCRIPTION

Segment 0815 begins at Bardwell Dam in Ellis County and continues up to the normal pool elevation of 421 feet, impounding Waxahachie Creek. There is one assessment unit in this segment, 0815\_01, that covers the entire reservoir. Sites in this assessment unit include 10979, 16700, 17582, 18437, 18549, and 18550.

Unclassified water bodies in this segment include those listed below.

0815A—Waxahachie Creek—A perennial stream from the confluence with Bardwell Reservoir at a normal pool elevation of 421 feet up to the headwaters west of Waxahachie in Ellis County. This segment includes sites 13686 and 18519.

Figure 0815.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs). Table 0815.1 lists the stations being monitored in fiscal year 2014 as well as the parameters being collected and the frequency of sampling.

### HYDROLOGIC CHARACTERISTICS

Bardwell Reservoir has a conservation pool elevation of 421 feet and is fed by Waxahachie Creek. This reservoir is used for flood control, water supply, and recreational activities. At the time of this writing, the reservoir has been below the conservation pool elevation by up to 5.16 feet since June 14, 2012. In Waxahachie Creek above Lake Bardwell, the median annual average flow is 20.9 cfs based on the past 5 years of data available at the USGS Gage station at Waxahachie (08063590). Over the past year, post-rainfall peak flows have returned to normal in less than a week for short duration rain events. Zero flow was reported for more than a month during the summer.

### IMPAIRMENT/AREA OF INTEREST DESCRIPTION

Based on the 2012 Texas Water Quality Integrated Report, there are impairments in assessment units 0815\_01 and 0815A\_01. Details of the assessment are located in Table 0815.2.

### LAND USE AND NATURAL CHARACTERISTICS

This segment and its watershed are entirely within the Northern Blackland Prairie ecoregion with the land use being nearly all classified as agriculture and pasture. There are small areas of forest and rangeland scattered throughout the watershed. There is some urbanization to the east of the lake in the City of Ennis. On the west side of the lake lies the smaller City of Bardwell.

### POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST

Nitrate concerns in this segment are likely due to agricultural fertilizer runoff. Chlorophyll-a concerns may also be related to the fertilizer runoff into the reservoir.

Runoff may be compounding the issues of increasing eutrophication of reservoirs as they age and the hypereutrophic status of the reservoir as noted in the TCEQ Trophic Classification of Texas Reservoirs report. Additionally, the 2010 TRA Basin Summary Report noted that high chlorophyll-a levels tended to occur during extended periods of low lake elevation indicating that algal blooms and lack of dilution from inflows may be contributing to these concerns.

### POTENTIAL STAKEHOLDERS

City of Ennis  
City of Bardwell  
City of Waxahachie  
Tarrant Regional Water District

### RECOMMENDATIONS FOR IMPROVING WATER QUALITY

Landowner education and implementation of best management practices (BMPs) may help reduce nitrate and chlorophyll-a levels in this segment.

### ONGOING PROJECTS

There are no ongoing projects in this segment.

### MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)

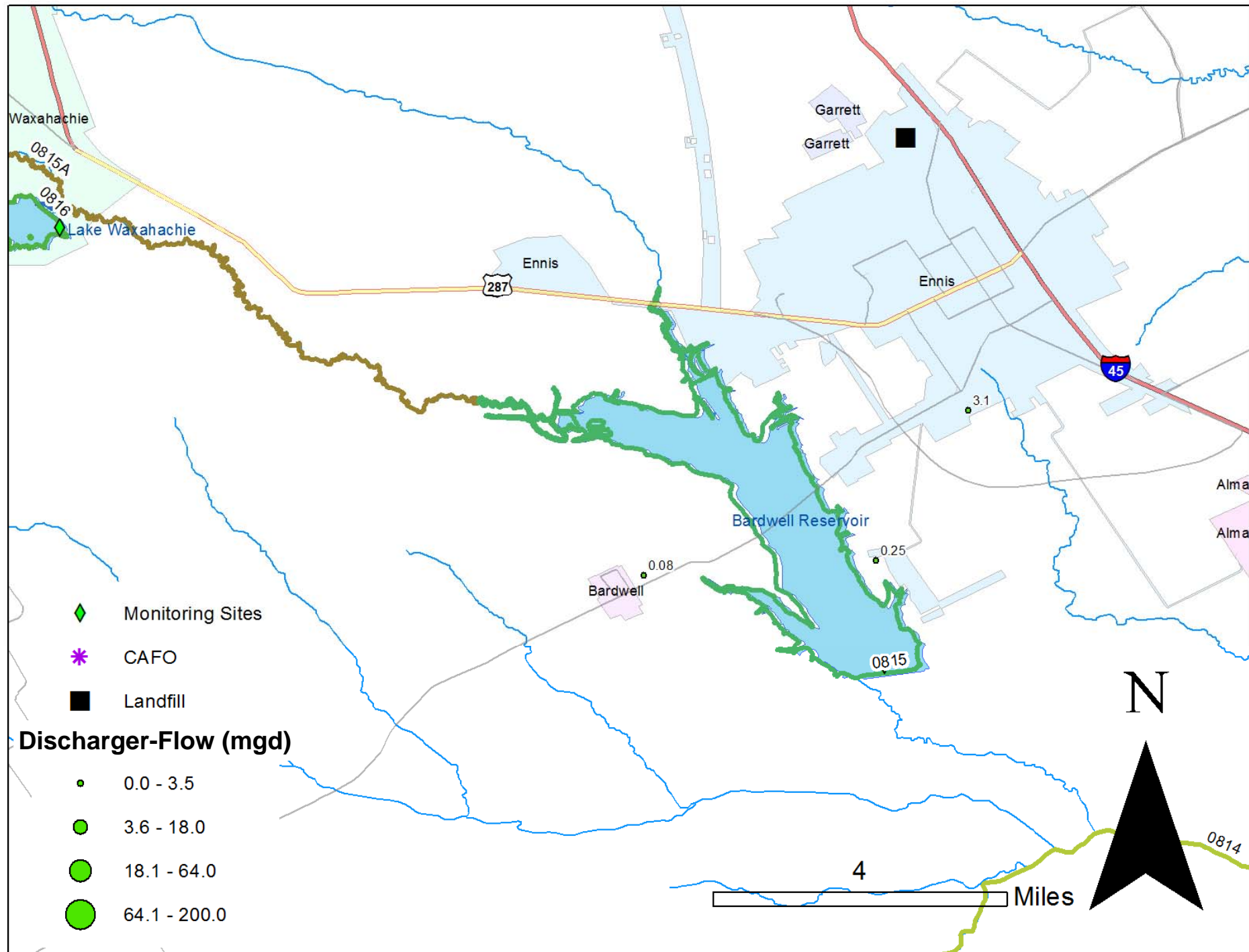
There are no known or anticipated events that would affect water quality in this segment. Four dischargers renewed their water quality permits in 2012. See Table 0815.3 for details.

### IMAGES

See Figures 0815.5 to 0815.8 for images of this segment.



FIGURE 0815.1



**TABLE 0815.1: Fiscal Year 2014 Monitoring**

Monitoring Entity	Segment	AU	Site ID	Site Description	Monitoring Type	24 Hour DO	Metals Water	Conventional	Bacteria	Flow	Field
TRA	0815	0815_01	10979	BARDWELL RESERVOIR 1.91 KM EAST AND 787 METERS NORTH OF INTERSECTION OF BARDWELL DAM RD AND FM 985 MID LAKE NEAR DAM USGS SITE AC	RT			4 (Total Alkalinity, TSS, VSS, NH3, TKN, TP, TOC, Chloride, Sulfate, Fluoride, Chlorophyll-a, Pheophytin-a TDS, OP)	4 (E. coli)		4 (Water Temp, Air Temp, Secchi Depth, Specific Conductance, DO, PH, Days Since Precipitation Event)

**TABLE 0815.2: 2012 Water Quality Integrated Report**

Segment and Assessment Unit	Use	Method	Parameter Description	Criteria	Number of samples assessed	Number of samples exceed criteria	Mean of samples assessed (avg or geometric)	Mean of samples that exceed criteria	Dataset Qualifier	Impairment Level	Impairment Category
0815_01	General Use	Nutrient Screening Levels	Chlorophyll-a	26.7	35	10		31.99	AD	CS	
0815_01	General Use	Nutrient Screening Levels	Nitrate	0.37	33	9		0.67	AD	CS	
0815A_01	General Use	Nutrient Screening Levels	Nitrate						ID	CS*	

Dataset Qualifier Codes

AD-Adequate Data (10 or more samples)

ID-Inadequate data (less than 4 samples)

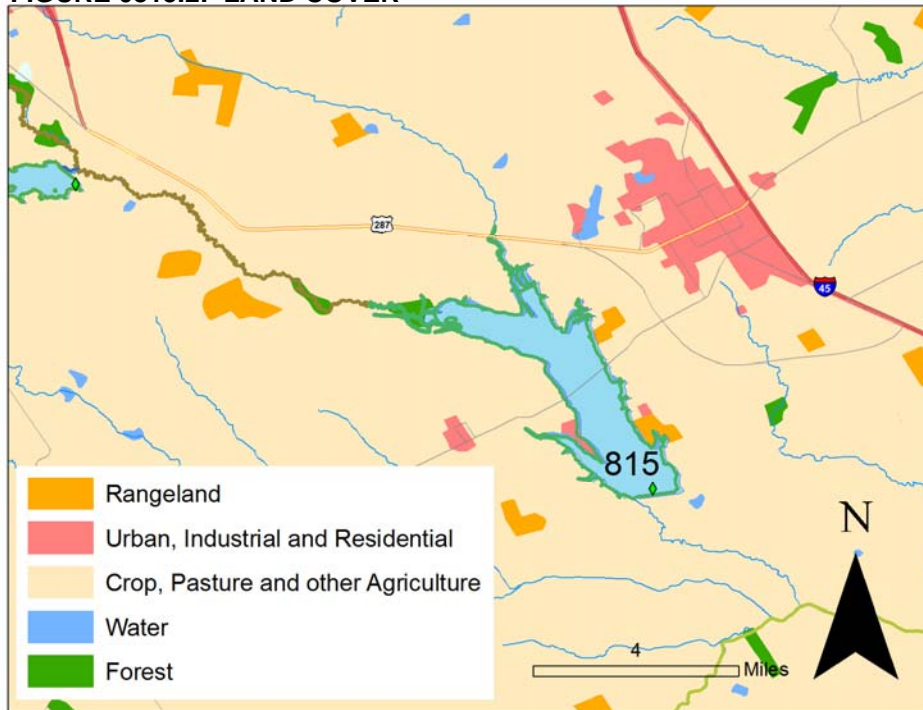
Impairment Level

CS-Screening level concern

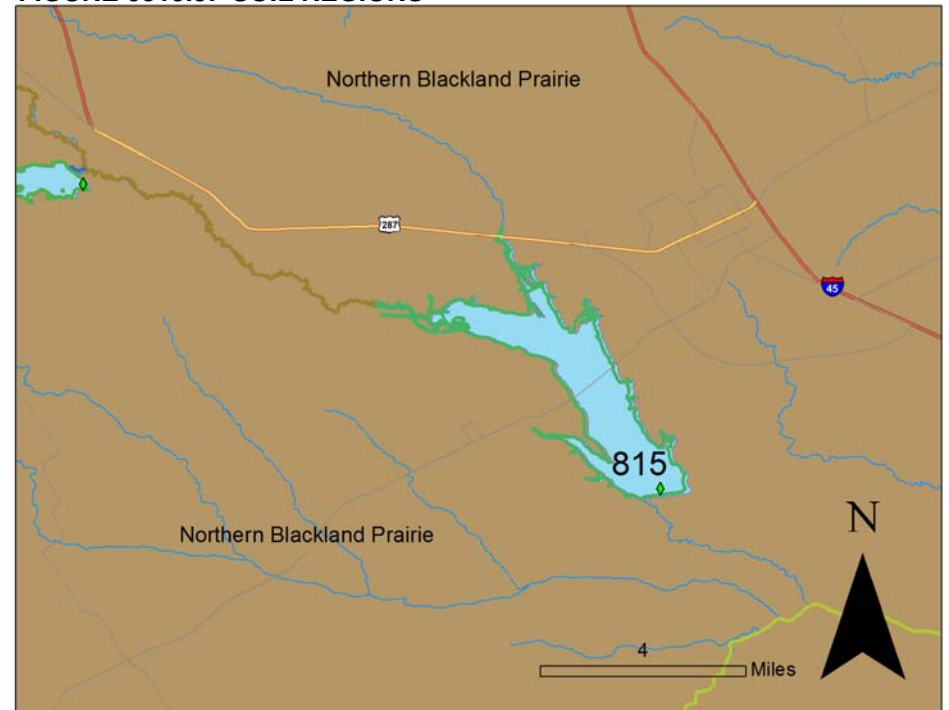
CS\*-Screening level concern carried forward from previous assessments



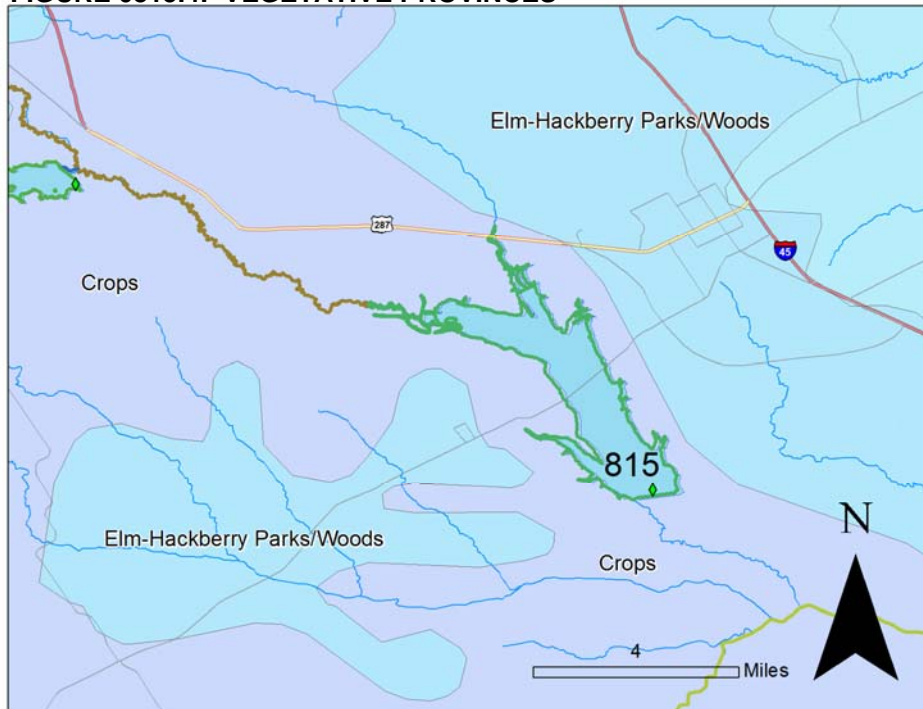
**FIGURE 0815.2: LAND COVER**



**FIGURE 0815.3: SOIL REGIONS**



**FIGURE 0815.4: VEGETATIVE PROVINCES**



**TABLE 0815.3: New and Renewed Discharge Permits**

Segment	Notice received by TRA on	Permitee/Facility	County	Permit Type	Action	Status	Permit Number
815	12/26/2012	CITY OF WAXAHACHIE	Ellis	Water Quality	Renew al	Final	10379-001
815	3/29/2012	MATHESON TRI-GAS, INC. - AIR SEPARATION PL	Ellis	Water Quality	Renew al	Final	04112-000
815	2/17/2012	OWENS CORNING > OWENS CORNING INSULATING SYSTEM LLC - WAXAHACHIE FIBERGLASS PL	Ellis	Water Quality	Renew al	Final	01178-000
815	2/17/2012	HOLCIM TEXAS LIMITED PARTNERSHIP - MIDLOTHIAN LIMESTONE QUARRY & CEMENT PLANT	Ellis	Water Quality	Renew al	Final	02580-000

**FIGURE 0815.5:**



02/04/2014 11:

**FIGURE 0815.6:**



02/04/2014 11:

**FIGURE 0815.7:**



02/04/2014 11:

**FIGURE 0815.8:**



02/04/2014 11:



# Richland Chambers Subwatershed

## **0814 – Chambers Creek Above Richland-Chambers Reservoir**

### **SEGMENT DESCRIPTION**

Segment 0814 begins at a point 4.0 km (2.5 miles) downstream of Tupelo Branch in Navarro County and continues up to the confluence of North Fork Chambers Creek and South Fork Chambers Creek. There are four assessment units in this segment. 0814\_01 is from the lower end of the segment up to just above the confluence with Cummins Creek. Sites in this assessment unit include 10975. 0814\_02 is from just above the confluence with Cummins Creek up to just above the confluence with Waxahachie Creek. Sites in this assessment unit include 10977 and 20000. 0814\_03 is from just above the confluence with Waxahachie Creek up to just above the confluence with Mill Branch. 0814\_04 is from just above the confluence with Mill Branch to the upper end of the segment. Sites in this assessment unit include 10978.

Unclassified water bodies in this segment include those listed below.

**0814A—Mill Creek**—A twenty-five mile stretch of Mill Creek running upstream from the confluence with Chambers Creek in Navarro County up to the Union Pacific Railroad in Milford in Ellis County. This segment includes site 18566.

**0814B—South Fork Chambers Creek**—A twenty-nine mile stretch of the South Fork of Chambers creek stretching from the confluence with Chambers Creek (Segment 0814) to the upper end of the South Fork Chambers Creek. This segment includes site 18570.

Figure 0814.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs). Table 0814.1 lists the stations being monitored in fiscal year 2014 as well as the parameters being collected and the frequency of sampling.

### **HYDROLOGIC CHARACTERISTICS**

The median annual average flow is 77.75 cfs based on historical values at the USGS flow gage on Waxahachie Creek near Bardwell (08063800). Based on the gage on Chambers Creek near Rice (08064100), the median annual average flow is 447.35 cfs. Over the past year, flow in Waxahachie Creek exceeded 3 cfs only once in the winter of 2013. Flow was below 1.3 cfs for the remainder of the year with zero flow being reported for much of the summer and early fall. Flows in Chambers Creek were below 10 cfs for much of the past year with zero flow for almost two months in the late summer. There were several high flow events in the spring, fall, and winter. Some of those events exceeded 500 cfs. Peak flows in Chambers Creek generally returned to normal within two weeks.

### **IMPAIRMENT/AREA OF INTEREST DESCRIPTION**

Based on the 2012 Texas Water Quality Integrated Report, there are impairments in assessment units 0814\_01 and 0814\_03. Details of the assessment are located in Table 0814.2.

### **LAND USE AND NATURAL CHARACTERISTICS**

This segment's watershed lies entirely within the Northern Blackland Prairie ecoregion and is nearly all classified as agriculture and pasture land. There are small areas of forest and rangeland scattered throughout the watershed. In addition, there are several small areas of urbanization.

### **POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST**

As noted in the 2010 TRA Basin Summary Report, concerns for low dissolved oxygen and elevated chlorophyll-a levels may be related to low flows and high water temperatures. Concerns for nutrients may be caused by runoff from agricultural fields during elevated flows and, to a lesser degree, wastewater treatment plants during low flows.

### **POTENTIAL STAKEHOLDERS**

City of Midlothian  
City of Waxahachie  
City of Ennis  
City of Corsicana  
Tarrant Regional Water District

### **RECOMMENDATIONS FOR IMPROVING WATER QUALITY**

Landowner education and implementation of best management practices (BMPs) may help reduce nutrient levels in this segment. Additional monitoring is suggested to determine if the low dissolved oxygen and elevated chlorophyll-a concerns are natural or anthropogenic.

### **ONGOING PROJECTS**

There are no ongoing projects in this segment.

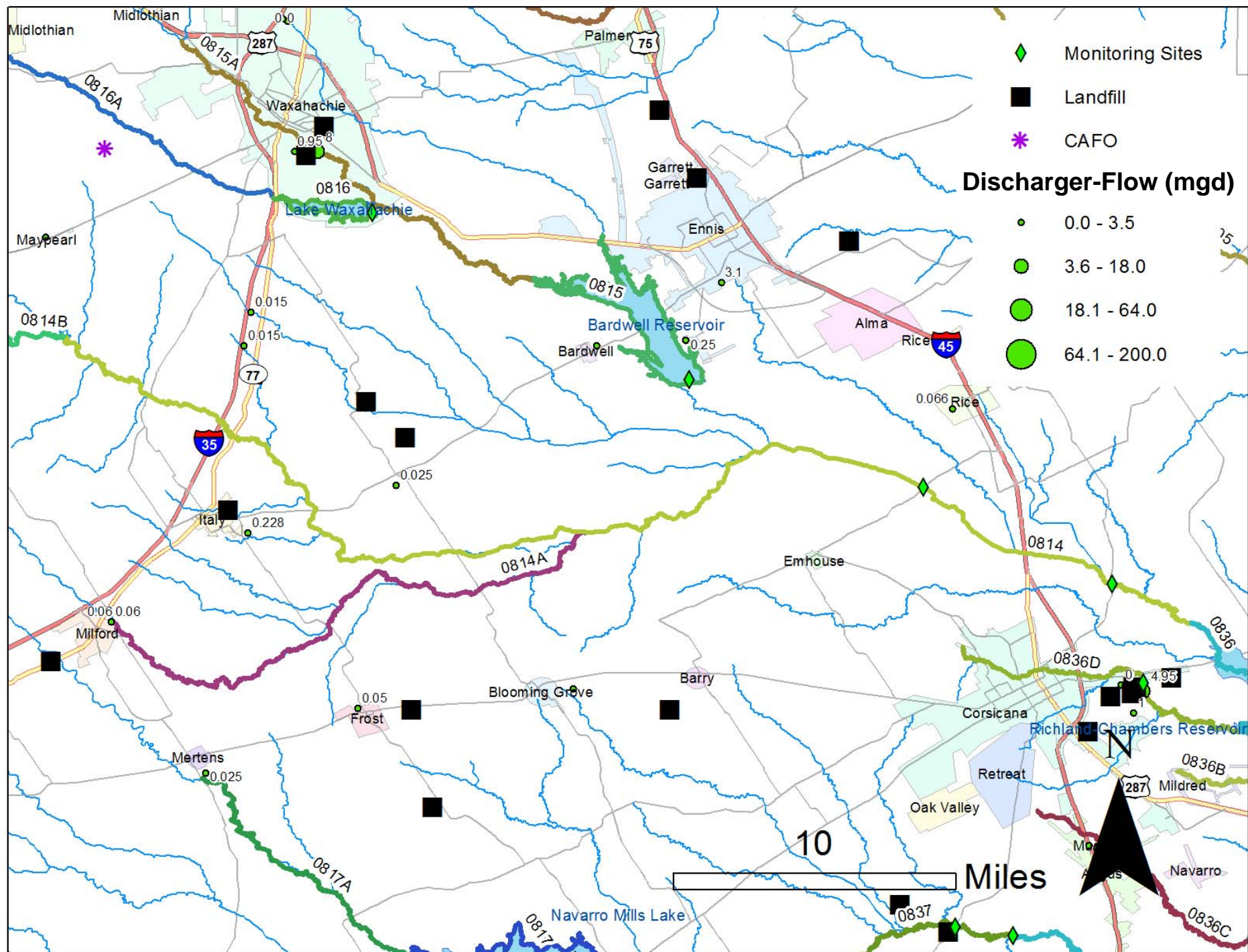
### **MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)**

There are no known or anticipated events that would affect water quality in this segment. Ten dischargers renewed their water quality permits in 2012. See Table 0814.3 for details.

### **IMAGES**

See Figures 0814.5 to 0814.8 for images of this segment.

FIGURE 0814.1



**TABLE 0814.1: Fiscal Year 2014 Monitoring**

Monitoring Entity	Segment	AU	Site ID	Site Description	Monitoring Type	24 Hour DO	Metals Water	Conventional	Bacteria	Flow	Field
TRWD	0814	0814_02	10977	CHAMBERS CREEK AT FM 1126	RT		12 (Total Arsenic)	12 (TSS, NH3, TKN, NO2+NO3, TP, TOC, Chloride, OP)	12 (E. coli)	12	12 (Water Temp, Specific Conductance, DO, pH, Flow Severity)



**TABLE 0814.2: 2012 Water Quality Integrated Report**

Segment and Assessment Unit	Use	Method	Parameter Description	Criteria	Number of samples assessed	Number of samples exceed criteria	Mean of samples assessed (avg or geometric mean)	Mean of samples that exceed criteria	Dataset Qualifier	Impairment Level	Impairment Category
0814_01	Aquatic Life Use	Dissolved Oxygen grab screening level	Dissolved Oxygen Grab	5	27	5		3.54	AD	CS	
0814_01	General Use	Nutrient Screening Levels	Orthophosphorus	0.37	25	10		0.97	AD	CS	
0814_01	General Use	Nutrient Screening Levels	Total Phosphorus	0.69	26	8		1.34	AD	CS	
0814_01	General Use	Nutrient Screening Levels	Chlorophyll-a	14.1	26	11		22.32	AD	CS	
0814_03	Aquatic Life Use	Dissolved Oxygen grab screening level	Dissolved Oxygen Grab						ID	CS*	
0814_03	General Use	Nutrient Screening Levels	Orthophosphorus						ID	CS*	
0814_03	General Use	Nutrient Screening Levels	Total Phosphorus						ID	CS*	
0814_03	General Use	Nutrient Screening Levels	Chlorophyll-a						ID	CS*	

Dataset Qualifier Codes

AD-Adequate Data (10 or more samples)

ID-Inadequate data (less than 4 samples)

Impairment Level

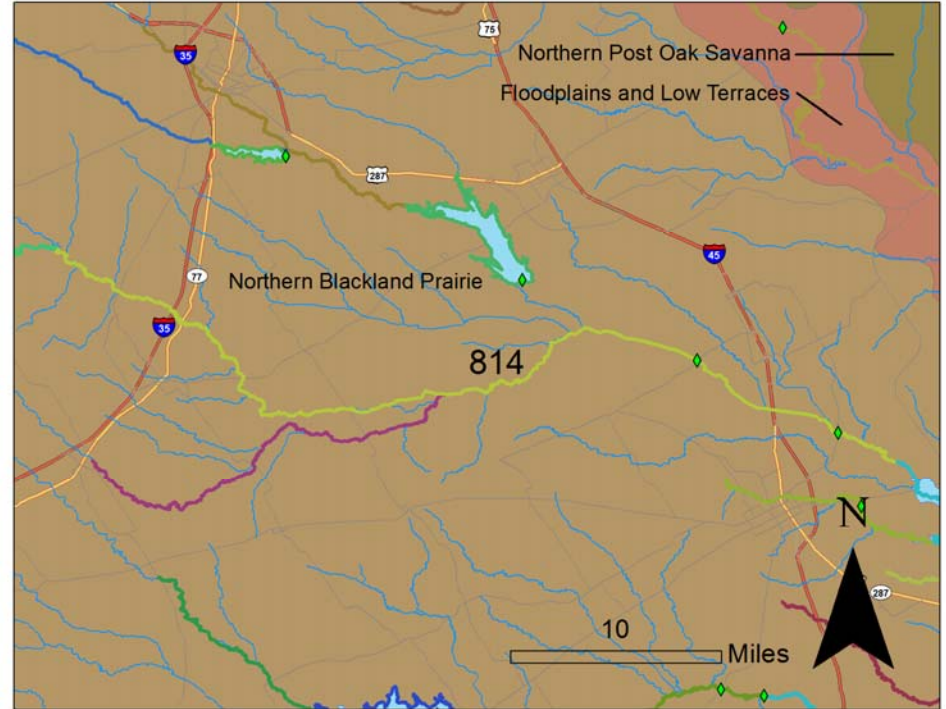
CS-Screening level concern

CS\*-Screening level concern carried forward from previous assessments

**FIGURE 0814.2: LAND COVER**



**FIGURE 0814.3: SOIL REGIONS**



**FIGURE 0814.4: VEGETATIVE PROVINCES**



**TABLE 0814.3: New and Renewed Discharge Permits**

Segment	Notice received by TRA on	Permitee/Facility	County	Permit Type	Action	Status	Permit Number
814	9/27/2012	MAYPEARL, CITY - STP	Elis	Water Quality	Renew al	Final	10431-001
814	8/30/2012	CITY OF ALVARADO	Johnson	Water Quality	Renew al	Final	10567-002
814	6/11/2012	TXDOT	Elis	Water Quality	Renew al	Final	11959-001
814	3/16/2012	TXDOT - I 35E SOUTHBOUND STP	Elis	Water Quality	Renew al	Final	11958-001
814	3/16/2012	THE SALVATION ARMY - CAMP HOBLITZELLE STP	Elis	Water Quality	Renew al	Final	13904-001
814	3/5/2012	KEENE, CITY OF	Johnson	Water Quality	Renew al	Final	10611-002
814	2/17/2012	PALMER, CITY - STP	Elis	Water Quality	Renew al	Final	14795-001
814	1/19/2012	MILFORD, CITY - STP	Elis	Water Quality	Renew al	Final	13937-001
814	1/9/2012	ENNIS, CITY - STP	Elis	Water Quality	Renew al	Final	10443-002
814	1/9/2012	FROST, CITY - STP	Navarro	Water Quality	Renew al	Final	10444-001



**FIGURE 0814.5:**



**FIGURE 0814.6:**



**FIGURE 0814.7:**



**FIGURE 0814.8:**



# Richland Chambers Subwatershed

## 0817 – Navarro Mills Lake

### SEGMENT DESCRIPTION

Segment 0817 begins at Navarro Mills Dam in Navarro County and continues up to the normal pool elevation of 424.5 feet, impounding Richland Creek. There is one assessment unit in this segment, 0817\_01, that covers the entire reservoir. Sites in this assessment unit include 10981, 17442, 18545, 18546, 18547, 18548, and 20633.

Unclassified water bodies in this segment include those listed below.

0817A—Richland Creek—A ten mile stretch of Richland Creek running upstream from 0.5 miles downstream of FM 744 in Navarro County up to FM 308 south of Mertens in Hill County. This segment includes site 18518.

Figure 0817.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs).

### HYDROLOGIC CHARACTERISTICS

Navarro Mills Lake has a conservation pool elevation of 424.5 feet and is fed by Richland Creek. This reservoir is used for flood control, water supply, and recreational activities. At the time of this writing, the reservoir has recently filled to the conservation pool elevation after being up to 3.34 feet low between July 2, 2012 and November 5, 2013.

### IMPAIRMENT/AREA OF INTEREST DESCRIPTION

Based on the 2012 Texas Water Quality Integrated Report, there is an impairment in assessment unit 0817\_01. Details of the assessment are located in Table 0817.1.

### LAND USE AND NATURAL CHARACTERISTICS

This segment's watershed is located entirely within the Northern Blackland Prairie ecoregion and is largely rural with agricultural and rangeland uses. There are several small residential communities around the lake.

### POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST

The agricultural nature of this watershed indicates that nitrate concerns may be related to runoff from fields. This lake has also been noted as being eutrophic in the TCEQ Trophic Classification of Texas Reservoir report.

### POTENTIAL STAKEHOLDERS

Town of Emmett  
Town of Pelham  
Town of Malone  
Town of Navarro Mills  
Tarrant Regional Water District

### RECOMMENDATIONS FOR IMPROVING WATER QUALITY

Landowner education and implementation of best management practices (BMPs) may help reduce nitrate levels in this segment.

### ONGOING PROJECTS

There are no ongoing projects in this segment.

### MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)

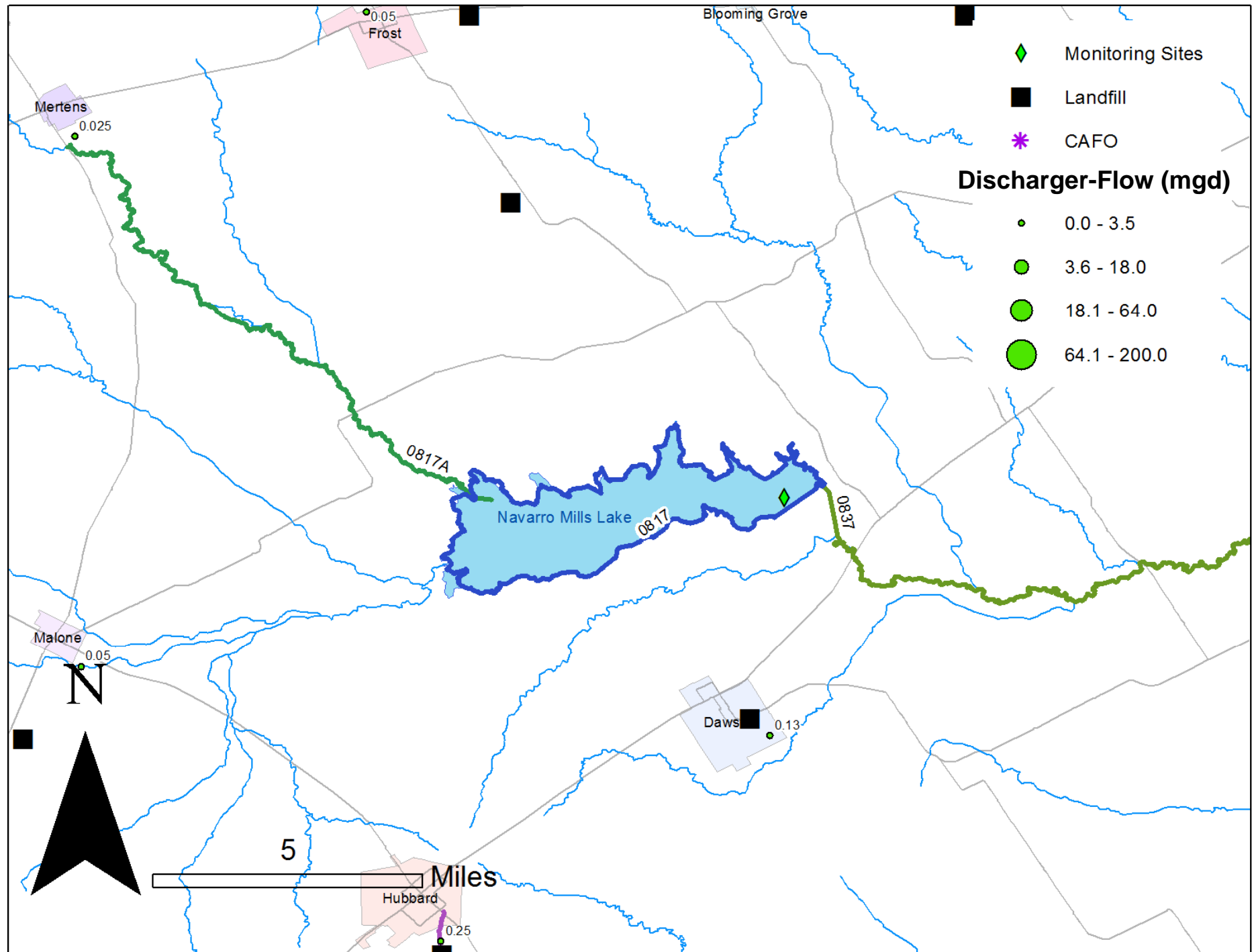
There are no known or anticipated events that would affect water quality in this segment. Two dischargers in 2012 and one in 2013 received new water quality permits. See Table 0817.2 for details.

### IMAGES

See Figure 0817.5 for an image of this segment.



FIGURE 0817.1





**TABLE 0817.1: 2012 Water Quality Integrated Report**

Segment and Assessment Unit	Use	Method	Parameter Description	Criteria	Number of samples assessed	Number of samples exceed criteria	Mean of samples assessed (avg or geomean)	Mean of samples that exceed criteria	Dataset Qualifier	Impairment Level	Impairment Category
0817_01	General Use	Nutrient Screening Levels	Nitrate	0.37	60	22		1.83	AD	CS	

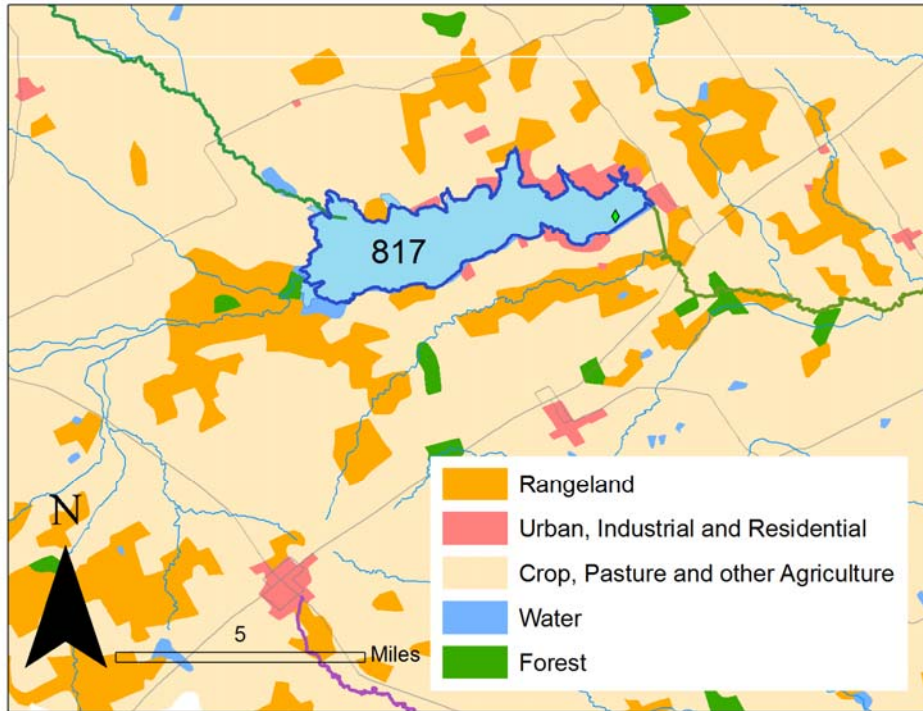
Dataset Qualifier Codes

AD-Adequate Data (10 or more samples)

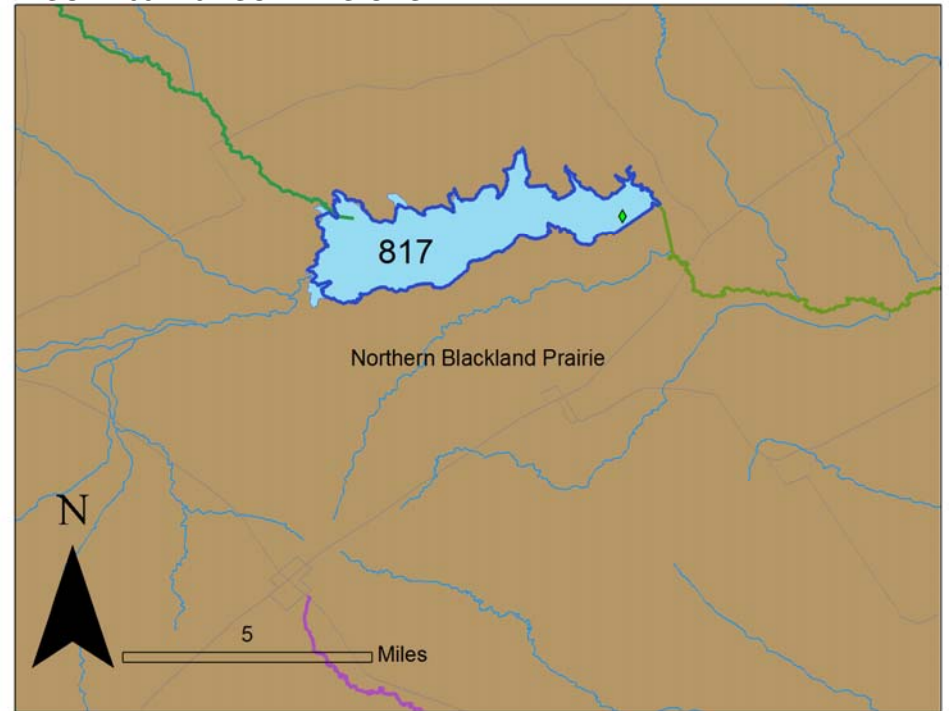
Impairment Level

CS-Screening level concern

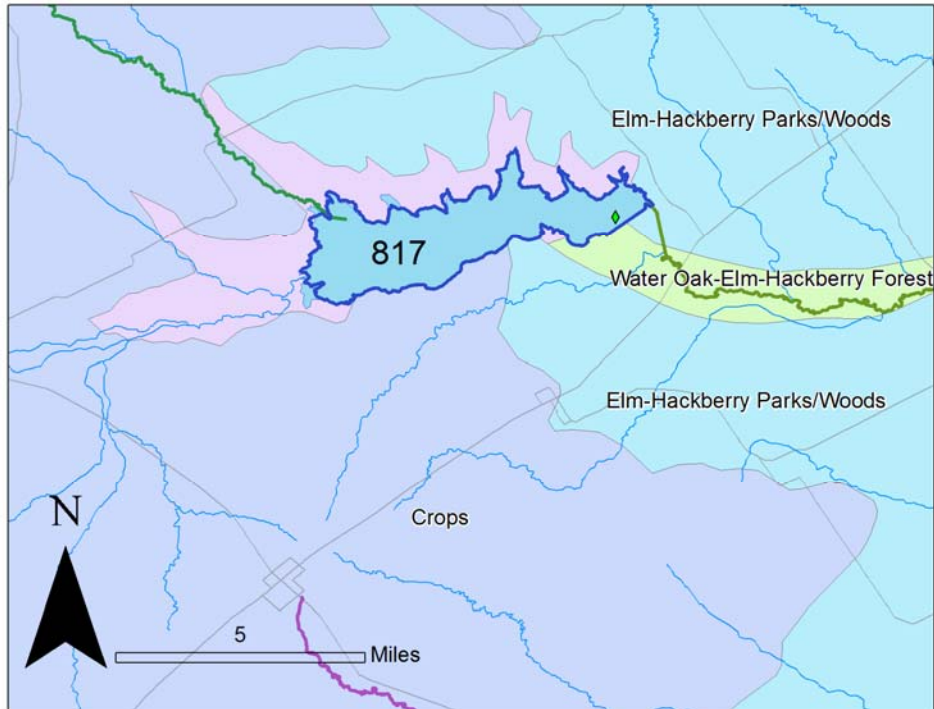
**FIGURE 0817.2: LAND COVER**



**FIGURE 0817.3: SOIL REGIONS**



**FIGURE 0817.4: VEGETATIVE PROVINCES**



**TABLE 0817.2: New and Renewed Discharge Permits**

Segment	Notice received by TRA on	Permitee/Facility	County	Permit Type	Action	Status	Permit Number
817	4/16/2013	CITY OF MERTENS	Hill	Water Quality	New	Final	15055-001
817	12/26/2012	CITY OF PENELOPE	Hill	Water Quality	Renew al	Final	13621-001
817	5/16/2012	TA OPERATING LLC --> TRUCKER'S CORNER, LP - STP	Hill	Water Quality	Renew al	Final	14769-001



**FIGURE 0817.5:**



# Richland Chambers Subwatershed

## **0837 – Richland Creek Above Richland-Chambers Reservoir**

### **SEGMENT DESCRIPTION**

Segment 0837 begins at the confluence of Pin Oak Creek in Navarro County and continues up to Navarro Mills Dam in Navarro County. There is one assessment unit in this segment, 0837\_01, that covers the entire segment. Sites in this assessment unit include 18344 and 11070.

Figure 0837.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs).

### **HYDROLOGIC CHARACTERISTICS**

The median annual average flow in this segment is 117.5 cfs based on historic values at the USGS flow gage near Dawson (08063100). Over the past year, drought conditions have persisted with flows only exceeding 20 cfs in the fall and winter of 2013.

### **IMPAIRMENT/AREA OF INTEREST DESCRIPTION**

Based on the 2012 Texas Water Quality Integrated Report, there is an impairment in assessment unit 0837\_01. Details of the assessment are located in Table 0837.1.

### **LAND USE AND NATURAL CHARACTERISTICS**

This watershed lies entirely within the Northern Blackland Prairie ecoregion and is largely rural with agricultural and rangeland uses. There are several forested areas along the creek and small residential communities scattered throughout the watershed.

### **POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST**

Low flow conditions in this segment are the most likely cause of low dissolved oxygen concerns in this segment. In the summer months, flows are regularly below 1 cfs and the USGS gage frequently reports zero flow during these times.

### **POTENTIAL STAKEHOLDERS**

Community of Purdon  
Community of Spring Hill  
Town of Richland  
Tarrant Regional Water District

### **RECOMMENDATIONS FOR IMPROVING WATER QUALITY**

Additional monitoring is suggested to determine if the low dissolved oxygen concerns are natural or anthropogenic.

### **ONGOING PROJECTS**

There are no ongoing projects in this segment.

### **MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)**

There are no known or anticipated events that would affect water quality in this segment. One discharger renewed their water quality permit in 2012. See Table 0837.2 for details.

### **IMAGES**

See Figures 0837.5 to 0837.8 for images of this segment.

FIGURE 0837.1

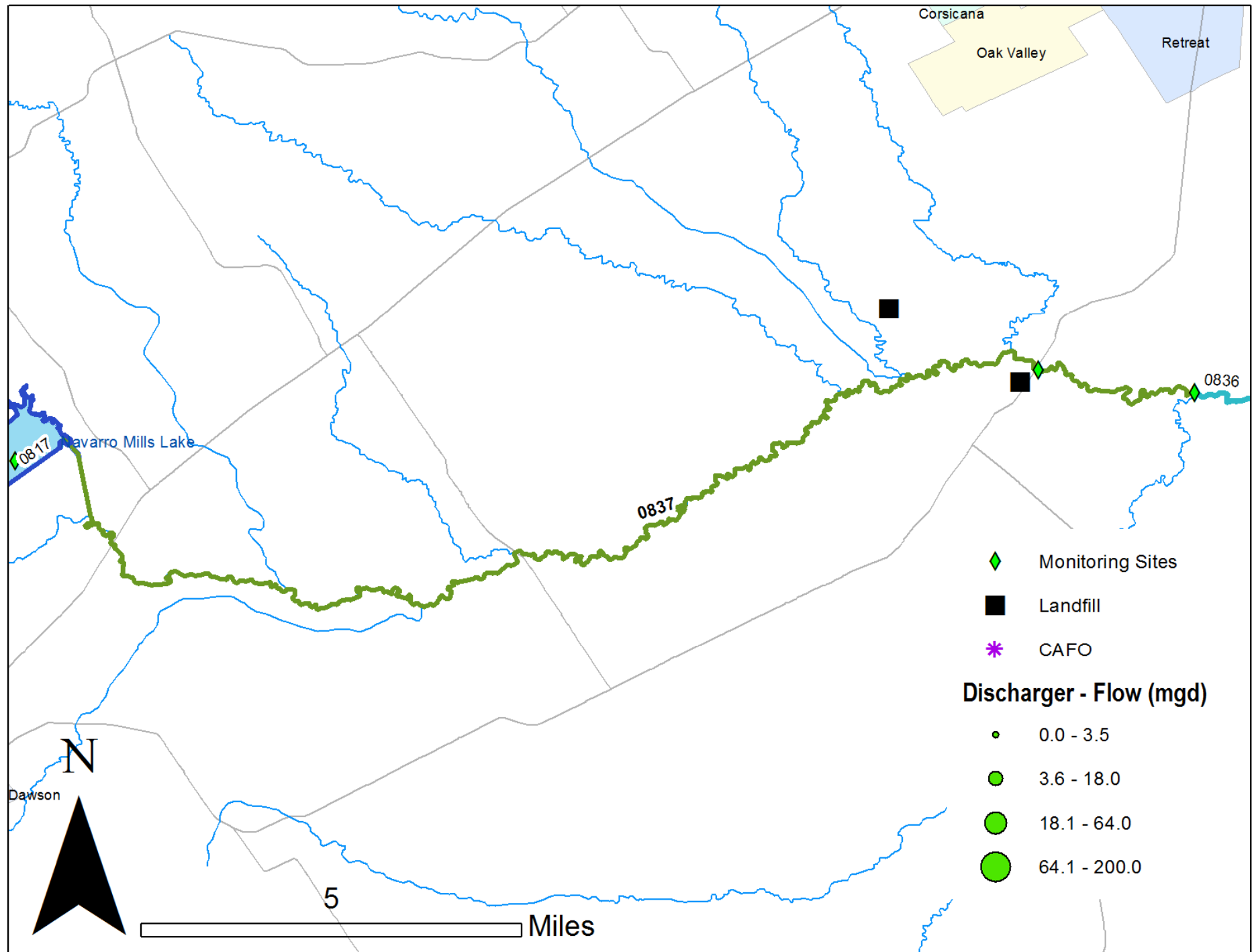




TABLE 0837.1: 2012 Water Quality Integrated Report

Segment and Assessment Unit	Use	Method	Parameter Description	Criteria	Number of samples assessed	Number of samples exceed criteria	Mean of samples assessed (avg or geomean)	Mean of samples that exceed criteria	Dataset Qualifier	Impairment Level	Impairment Category
0837_01	Aquatic Life Use	Dissolved Oxygen grab screening level	Dissolved Oxygen Grab	5	8	2		4.25	LD	CS	

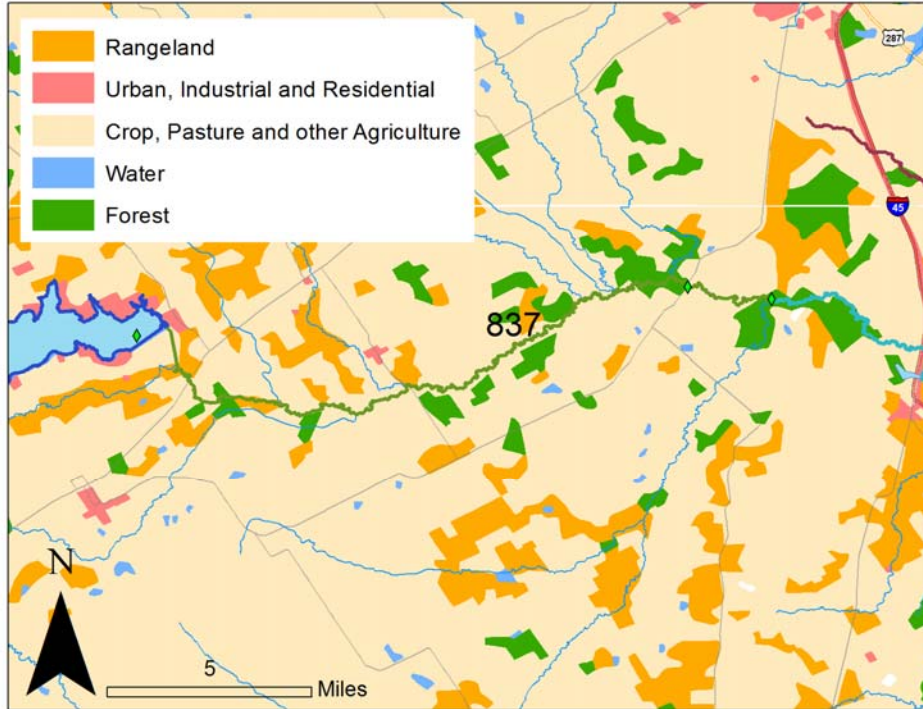
Dataset Qualifier Codes

LD-Limited Data (between 4 and 9 samples)

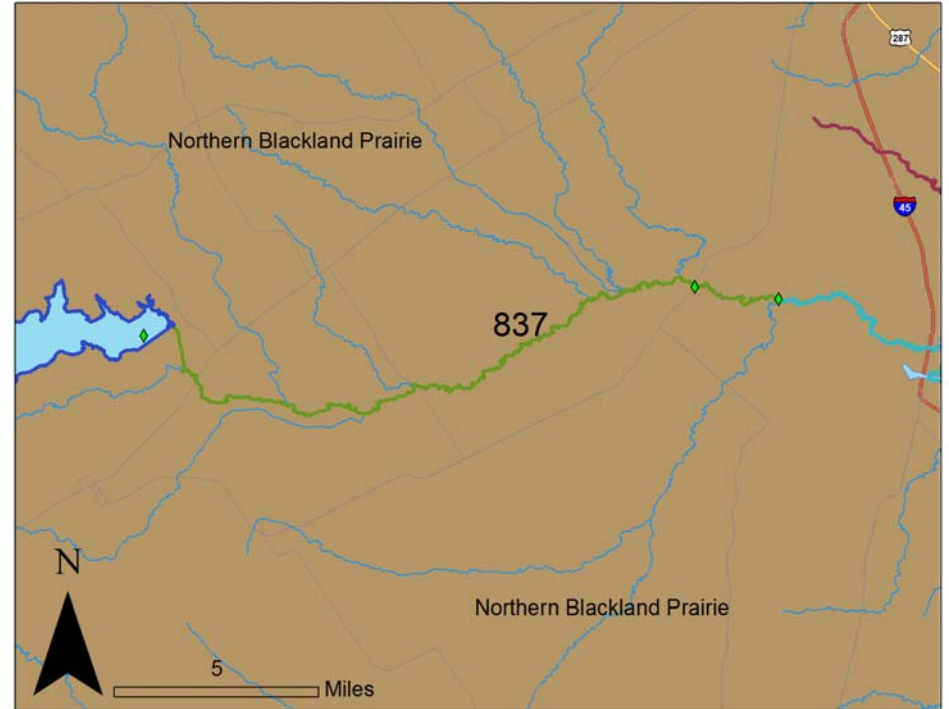
Impairment Level

CS-Screening level concern

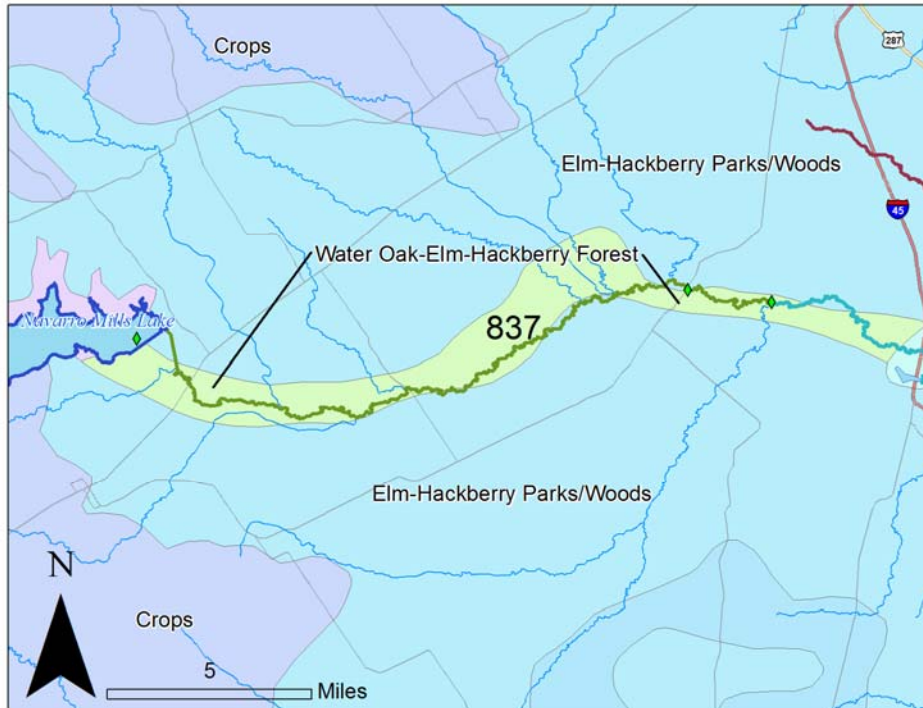
**FIGURE 0837.2: LAND COVER**



**FIGURE 0837.3: SOIL REGIONS**



**FIGURE 0837.4: VEGETATIVE PROVINCES**



**TABLE 0837.2: New and Renewed Discharge Permits**

Segment	Notice received by TRA on	Permitee/Facility	County	Permit Type	Action	Status	Permit Number
837	1/9/2012	BLOOMING GROVE, CITY - STP	Navarro	Water Quality	Renew al	Final	11606-001



**FIGURE 0837.5:**



**FIGURE 0837.6:**



**FIGURE 0837.7:**



**FIGURE 0837.8:**



# Richland Chambers Subwatershed

## 0836 – Richland-Chambers Reservoir

### SEGMENT DESCRIPTION

Segment 0836 begins at Richland-Chambers Dam in Freestone County and continues up to a point immediately upstream of the confluence of Pin Oak Creek on the Richland Creek Arm in Navarro County and to a point 4.0 kilometers (2.5 miles) downstream of Tupelo Branch on the Chambers Creek Arm in Navarro County. It impounds Richland and Chambers Creeks up to the normal pool elevation of 315 feet. There are eight assessment units in this segment. 0836\_01 is the lowermost portion of reservoir, adjacent to dam. Sites in this assessment unit include 11065 and 15168. 0836\_02 is the confluence of Richland and Chambers Creek arms. Sites in this assessment unit include 15169. 0836\_03 is the lower portion of Chambers Creek arm. Sites in this assessment unit include 15170 and 18720. 0836\_04 is the upper portion of Chambers Creek arm. Sites in this assessment unit include 15199 and 18724. 0836\_05 is the lower portion of Richland Creek arm. Sites in this assessment unit include 11068. 0836\_06 is the upper portion of Richland Creek arm. Sites in this assessment unit include 15172 and 18727. 0836\_07 is the remainder of reservoir. 0836\_08 is the Post Oak Creek Arm off of Chambers Creek Arm of Richland Chambers Reservoir. Sites in this assessment unit include 18723.

Unclassified water bodies in this segment include those listed below.

0836A—Pin Oak Creek—A perennial stream from the confluence with the North Fork of Pin Oak Creek in Limestone County upstream to the confluence with Pin Oak Creek and an unnamed tributary approximately 8.0 km upstream of SH 171.

0836B—Cedar Creek—From the confluence with Richland Chambers Reservoir to the upper end of the creek. This segment includes sites 18716, 18718, and 18719.

0836C—Grape Creek—From the confluence with Richland Chambers Reservoir to the upper end of the creek southwest of Corsicana in Navarro County. This segment includes site 18721.

0836D—Post Oak Creek—From the confluence with Richland Chambers Reservoir to the upper end of the creek. This segment includes site 18722.

Figure 0836.1 shows the locations of assessment units, monitoring stations, dischargers, landfills, and confined animal feeding operations (CAFOs). Table 0836.1 lists the stations being monitored in fiscal year 2014 as well as the parameters being collected and the frequency of sampling.

### HYDROLOGIC CHARACTERISTICS

Richland-Chambers Reservoir has a conservation pool elevation of 314 feet and is fed by Chambers Creek in the northern arm and Richland Creek in the southern arm. This reservoir is used for water supply and recreational activities. At the time of this writing, the reservoir has been below the conservation pool elevation by up to 9.21 feet since July 8, 2012.

### IMPAIRMENT/AREA OF INTEREST DESCRIPTION

Based on the 2012 Texas Water Quality Integrated Report, there are impairments in assessment units 0836\_01, 0836\_04, 0836\_05, 0836B\_01, 0836C\_01, and 0836D\_01. Details of the assessment are located in Table 0836.2.

### LAND USE AND NATURAL CHARACTERISTICS

The upper reaches of this watershed and the upstream half of the lake lie within the Northern Blackland Prairie ecoregion while the downstream half of the lake lies within the Southern Post Oak Savanna. A majority of this watershed is rural with agriculture being the predominant land use. There are small forested and rangeland areas scattered throughout the watershed as well as several small communities. The City of Corsicana is the largest urbanized area in this watershed.

### POTENTIAL CAUSES OF IMPAIRMENT OR INTEREST

Low dissolved oxygen and elevated chlorophyll-a concerns may be related to the eutrophic status of the reservoir as noted in the TCEQ Trophic Classification of Texas Reservoirs report. Nutrient concerns may be due to runoff from the agricultural fields in the watershed. Elevated nutrients could affect the chlorophyll-a levels in the reservoir as well.

### POTENTIAL STAKEHOLDERS

City of Corsicana  
Town of Richland  
Town of Navarro  
Town of Mildred  
Town of Eureka  
Tarrant Regional Water District

### RECOMMENDATIONS FOR IMPROVING WATER QUALITY

Landowner education and implementation of best management practices (BMPs) may help reduce nutrient and chlorophyll-a levels in this segment.

### ONGOING PROJECTS

The Richland Chambers Reservoir Transition Zones project is underway in this segment. The goal of this project is to develop site specific standards for the transition zones within the reservoir. The project is currently in the planning phase and is managed by the Water Quality Standards team of the TCEQ.

### MAJOR WATERSHED EVENTS (PRESENT AND FUTURE)

There are no known or anticipated events that would affect water quality in this segment. Three dischargers renewed their water quality permits in 2012. See Table 0836.3 for details.

### IMAGES

See Figures 0836.5 to 0836.8 for images of this segment.



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**TABLE 0836.1: Fiscal Year 2014 Monitoring**

Monitoring Entity	Segment	AU	Site ID	Site Description	Monitoring Type	24 Hour DO	Metals Water	Conventional	Bacteria	Flow	Field
TRWD	0836	0836_01	15168	RICHLAND-CHAMBERS RESERVOIR AT NORTH END OF DAM 332 METERS SOUTH AND 555 METERS WEST OF INTERSECTION OF US 287 AND RR 488	RT			5 (Total Alkalinity, TSS, NH3, TKN, NO2+NO3, TP, TOC, DOC, Chloride, Chlorophyll-a, TDS, OP)	4 (E. coli)		5 (Water Temp, Secchi Depth, Specific Conductance, DO, pH)
TRWD	0836	0836_02	15169	RICHLAND-CHAMBERS RESERVOIR 1.95 KM NORTH AND 2.26 KM WEST OF INTERSECTION OF SE 3190 ROAD AND OLD HIGHWAY 287	RT			5 (Total Alkalinity, TSS, NH3, TKN, NO2+NO3, TP, TOC, DOC, Chloride, Sulfate, Chlorophyll-a, TDS, OP, Phytoplankton)	4 (E. coli)		5 (Water Temp, Secchi Depth, Specific Conductance, DO, pH)
TRWD	0836	0836_03	15170	RICHLAND-CHAMBERS RESERVOIR CHAMBERS CREEK ARM NEAR TCWCID 1 PUMP STATION 570 M S AND 1.16 KM W OF INTERSECT OF SE 3240 AND SE 3250	BS	2					
TRWD	0836	0836_03	15170	RICHLAND-CHAMBERS RESERVOIR CHAMBERS CREEK ARM NEAR TCWCID 1 PUMP STATION 570 M S AND 1.16 KM W OF INTERSECT OF SE 3240 AND SE 3250	RT		12 (Total Calcium, Magnesium, Sodium, Potassium, Arsenic, Iron, Manganese)	12 (Total Alkalinity, TSS, NH3, TKN, NO2+NO3, TP, TOC, DOC, Chloride, Sulfate, Chlorophyll-a, TDS, OP, Phytoplankton)	4 (E. coli)		12 (Water Temp, Secchi Depth, Specific Conductance, DO, pH)
TRWD	0836	0836_04	15199	RICHLAND-CHAMBERS RESERVOIR UPPER END OF CHAMBERS CREEK ARM 2.52 KM NORTH AND 329 METERS WEST OF INTERSECTION OF WICHITA TRL AND FM 637	RT			5 (Total Alkalinity, TSS, NH3, TKN, NO2+NO3, TP, TOC, DOC, Chloride, Chlorophyll-a, TDS, OP)	4 (E. coli)		5 (Water Temp, Secchi Depth, Specific Conductance, DO, pH)
TRWD	0836	0836_05	11068	RICHLAND-CHAMBERS RESERVOIR RICHLAND CREEK ARM MID LAKE 2.24 KM SOUTH AND 276 METERS EAST OF INTERSECTION OF PETTY RD AND SE 2230 RD	RT			5 (Total Alkalinity, TSS, NH3, TKN, NO2+NO3, TP, TOC, DOC, Chloride, Sulfate, Chlorophyll-a, TDS, OP, Phytoplankton)	4 (E. coli)		5 (Water Temp, Secchi Depth, Specific Conductance, DO, pH)
TRWD	0836	0836_06	15172	RICHLAND-CHAMBERS RESERVOIR IN UPPER END OF RICHLAND CREEK ARM 2.01 KM S AND 150 METERS E OF INTERSECTION OF NAVARRO SLAB AND SE 1095	RT			5 (Total Alkalinity, TSS, NH3, TKN, NO2+NO3, TP, TOC, DOC, Chloride, Chlorophyll-a, TDS, OP)	4 (E. coli)		5 (Water Temp, Secchi Depth, Specific Conductance, DO, pH)
TRWD	0836		16721	RICHLAND CREEK AT SW 0030 RD UPSTREAM OF RICHLAND-CHAMBERS RESERVOIR	RT		12 (Total Arsenic)	12 (TSS, NH3, TKN, NO2+NO3, TP, TOC, Chloride, OP)	12 (E. coli)		12 (Water Temp, Specific Conductance, DO, pH, Flow Severity)
TRWD	0836D	0836D_01	17847	POST OAK CREEK 109 METERS DOWNSTREAM OF POWELL PIKE EAST OF CORSICANA	RT		12 (Total Arsenic)	12 (TSS, NH3, TKN, NO2+NO3, TP, TOC, Chloride, OP)	12 (E. coli)	12	12 (Water Temp, Specific Conductance, DO, pH, Flow Severity)

**TABLE 0836.2: 2012 Water Quality Integrated Report**

Segment and Assessment Unit	Use	Method	Parameter Description	Criteria	Number of samples assessed	Number of samples exceed criteria	Mean of samples assessed (avg or geomean)	Mean of samples that exceed criteria	Dataset Qualifier	Impairment Level	Impairment Category
0836_01	Aquatic Life Use	Dissolved Oxygen grab screening level	Dissolved Oxygen Grab	5	37	4		4.07	AD	CS	
0836_04	General Use	Nutrient Screening Levels	Chlorophyll-a	26.7	18	9		37.52	AD	CS	
0836_04	General Use	Nutrient Screening Levels	Total Phosphorus	0.2	18	9		0.28	AD	CS	
0836_04	General Use	Nutrient Screening Levels	Nitrate	0.37	18	6		1.09	AD	CS	
0836_05	General Use	Nutrient Screening Levels	Chlorophyll-a	26.7	34	10		33.69	AD	CS	
0836B_01	Aquatic Life Use	Dissolved Oxygen grab screening level	Dissolved Oxygen Grab						ID	CS*	
0836B_01	Aquatic Life Use	Dissolved Oxygen 24hr average	Dissolved Oxygen 24hr Avg						ID	NS*	5b
0836C_01	Aquatic Life Use	Dissolved Oxygen grab screening level	Dissolved Oxygen Grab						ID	CS*	
0836C_01	Aquatic Life Use	Dissolved Oxygen 24hr average	Dissolved Oxygen 24hr Avg						ID	CN*	
0836C_01	Aquatic Life Use	Dissolved Oxygen 24hr minimum	Dissolved Oxygen 24hr Min						ID	CN*	
0836D_01	Aquatic Life Use	Dissolved Oxygen grab screening level	Dissolved Oxygen Grab						ID	CS*	

Dataset Qualifier Codes

AD-Adequate Data (10 or more samples)

ID-Inadequate data (less than 4 samples)

Impairment Level

CN\*-Use concern carried forward from previous assessments

CS-Screening level concern

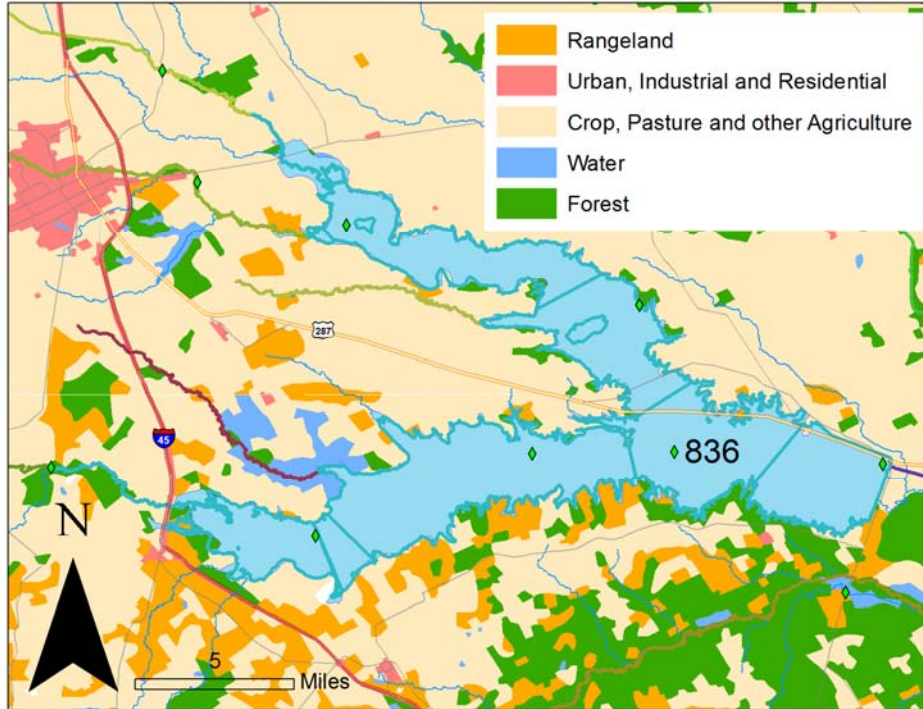
CS\*-Screening level concern carried forward from previous assessments

NS\*-Nonsupport carried forward from previous assessments

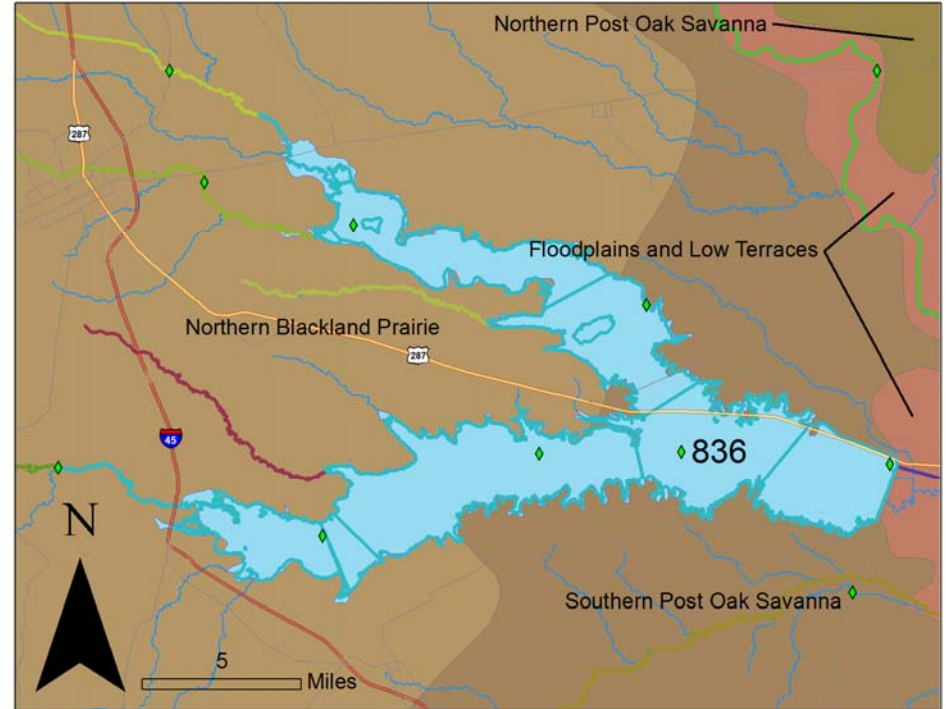
Impairment Category

5b-A review of the water quality standards for this water body will be conducted before a TMDL is scheduled

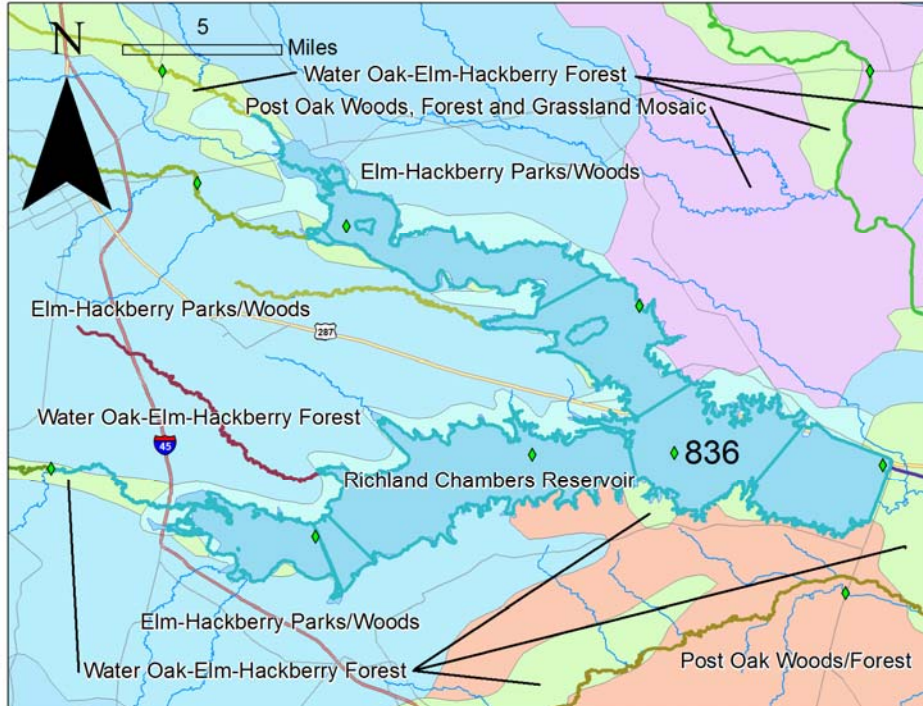
**FIGURE 0836.2: LAND COVER**



**FIGURE 0836.3: SOIL REGIONS**



**FIGURE 0836.4: VEGETATIVE PROVINCES**





**TABLE 0836.3: New and Renewed Discharge Permits**

Segment	Notice received by TRA on	Permitee/Facility	County	Permit Type	Action	Status	Permit Number
836	9/27/2012	TX-DOT	Navarro	Water Quality	Renew al	Final	14854-001
836	8/6/2012	WHITE ROCK HOMEOWNERS ASSOCIATION INC	Navarro	Water Quality	Renew al	Final	14821-001
836	2/17/2012	AQUASOURCE DEVELOPMENT>AQUA DEVELOPMENT, INC.	Denton	Water Quality	Renew al	Final	14234-001

**FIGURE 0836.5:**



**FIGURE 0836.6:**



**FIGURE 0836.7:**



**FIGURE 0836.8:**



**0818**

13845—CEDAR CREEK RESERVOIR USGS SITE AC 53 METERS SOUTH AND 1.80 KM WEST OF INTERSECTION OF JUPITER ROAD AND FM 3062

13848—CEDAR CREEK RESERVOIR USGS SITE CC 477 METERS SOUTH AND 2.49 KM WEST OF INTERSECTION OF CR 2830 AND CAROLYNN ROAD

13854—CEDAR CREEK RESERVOIR USGS SITE GR 522 METERS SOUTH AND 3.33 KM WEST OF INTERSECTION OF CR 4006 AND HARBOR POINT ROAD

15812—CEDAR CREEK RESERVOIR MID LAKE 1.61 KM NORTH AND 108 METERS EAST OF INTERSECTION OF DEER RUN ROAD AND FOREHAND DRIVE

16739—CEDAR CREEK RESERVOIR TWIN CREEK COVE AT SH 198 BRIDGE 926 METERS SOUTH AND 131 METERS EAST OF INTERSECTION OF HARMON ROAD AND SH 198

16741—CEDAR CREEK RESERVOIR OUTER CEDAR BRANCH COVE 268 METERS SOUTH AND 189 METERS EAST OF INTERSECTION OF ROYALWOOD DRIVE AND ENCHANTED DR

16743—CEDAR CREEK RESERVOIR CLEAR CREEK COVE AT SH198 BRIDGE 453 METERS SOUTH AND 202 METERS EAST OF INTERSECTION OF IMPERIAL DR AND SH 198

16744—CEDAR CREEK RESERVOIR CANEY CREEK COVE AT SH 198 BRIDGE 530 METERS SOUTH AND 185 METERS EAST OF INTERSECTION OF FM 1214 AND SH 198

16745—CEDAR CREEK RESERVOIR NEAR DAM 704 METERS NORTH AND 1.61 KM EAST OF INTERSECTION OF LAKESHORE DRIVE AND FOREHAND DRIVE

16746—CEDAR CREEK RESERVOIR 284 METERS SOUTH AND 484 METERS WEST OF INTERSECTION OF OAKVIEW TRAIL AND CAROLYNN ROAD

16747—CEDAR CREEK RESERVOIR 12 METERS NORTH AND 586 METERS EAST OF INTERSECTION OF ASHBY LANE AND BURLEY LOOP

16748—CEDAR CREEK RESERVOIR 710 M W AND 1.01 M W OF INTERSECTION OF WOODLAWN WAY AND SUNSET BLVD AT CONFLUENCE OF CANEY CK AND CLEAR CK COVES

16749—CEDAR CREEK RESERVOIR 1.01 KM SOUTH AND 1.34 KM WEST OF INTERSECTION OF CAROLYNN ROAD AND OAKVIEW TRAIL

16750—CEDAR CREEK RESERVOIR 121 METERS SOUTH AND 719 METERS EAST OF INTERSECTION OF OAK SHORE DRIVE AND CHEROKEE TRAIL

16751—CEDAR CREEK RESERVOIR PRAIRIE CREEK COVE 10 METERS SOUTH AND 189 METERS EAST OF INTERSECTION OF FOREST LANE AND DOGWOOD TRAIL

16752—CEDAR CREEK RESERVOIR PRAIRIE CREEK COVE 22 METERS SOUTH AND 293 METERS EAST OF INTERSECTION OF LAKEVIEW DRIVE AND VETERANS LANE

16753—CEDAR CREEK RESERVOIR 1.42 KM NORTH AND 1.37 KM EAST OF INTERSECTION OF NOB HILL ROAD AND SH 334

16771—CEDAR CREEK RESERVOIR 1.53 KM S AND 531 M E OF INTERSECTION OF KAUFMAN CR 402 AND SH 175 AT NORTH END OF RESERVOIR LACY CREEK COVE

16772—CEDAR CREEK RESERVOIR NORTH MID LAKE 800 M NORTH AND 2.59 KM EAST OF INTERSECTION OF KAUFMAN CR 4042 AND KAUFMAN CR 4043

16773—CEDAR CREEK RESERVOIR NEAR CEDAR CREEK COVE 1.20 KM SOUTH AND 99 METERS EAST OF INTERSECTION OF KAUFMAN CR 4023 AND US 175

16774—CEDAR CREEK RESERVOIR NEAR KINGS CREEK COVE 786 METERS SOUTH AND 1.97 KM EAST OF INTERSECTION OF SH 274 AND FM 148

17090—CEDAR CREEK RESERVOIR NEAR CHEROKEE SHORES RAW WATER INTAKE IN CEDAR BR ARM 99 M S AND 416 M W OF INTERSECTION OF CEDAR DR AND BIRCH RD

18469—CEDAR CREEK RESERVOIR IN KINGS CREEK COVE 1.15 KM DOWNSTREAM OF SH 274 AND 1.01 KM E OF SH 274/FM 148 INTERSECTION

18470—CEDAR CREEK RESERVOIR IN KINGS CREEK COVE 2.73 KM E AND 1.58 KM S OF SH 274/FM 148 INTERSECTION

18471—CEDAR CREEK RESERVOIR IN KINGS CREEK COVE 3.74 KM E AND 2.29 KM S OF SH 274/FM 148 INTERSECTION



# Site Glossary

## **0814**

10975—CHAMBERS CREEK AT FM 3041

10977—CHAMBERS CREEK AT FM 1126

10978—CHAMBERS CREEK AT FM 876 NEAR ITALY

20000—CHAMBERS CREEK IMMEDIATELY UPSTREAM OF ENSIGN ROAD

## **0814A**

18566—MILL CREEK 7 M UPSTREAM OF LOWELL ROAD NEAR MILFORD TX

## **0814B**

18570—SOUTH FORK CHAMBERS CREEK 15 M DOWNSTREAM OF JOHNSON CR 102 IMMEDIATELY NE OF MARTHA LANE NEAR MAYPEARL TX

## **0815**

10979—BARDWELL RESERVOIR 1.91 KM EAST AND 787 METERS NORTH OF INTERSECTION OF BARDWELL DAM RD AND FM 985 MID LAKE NEAR DAM USGS SITE AC

16700—BARDWELL RESERVOIR MUSTANG CREEK ARM AT W ENNIS PKWY 180 M N AND 472 M E OF INTERSECTION OF OLD WAXAHACHIE RD AND W ENNIS RD SW OF ENNIS

17582—BARDWELL RESERVOIR AT PUMP INTAKE 313 METERS NORTH AND 167 METERS EAST OF INTERSECTION OF SH 34 AND HILLTOP DRIVE

18437—BARDWELL LAKE AT MOTT PARK BETWEEN SWIM BEACH AND HIGH VIEW MARINA 745 M E AND 220 M N OF FM 985 AT CANE RD

18549—BARDWELL RESERVOIR 12 M UPSTREAM OF SH 34 BRIDGE 600 M ALONG BRIDGE FROM NE SHORE USGS SITE BC 321704096393501

18550—BARDWELL RESERVOIR NORTH WAXAHACHIE CREEK ARM 628 M NORTH AND 13 M EAST OF THE END OF BOZAK LN USGS SITE DC 321758096412901

## **0815A**

13686—WAXAHACHIE CREEK AT GELZENDANER ROAD

18519—WAXAHACHIE CREEK IMMEDIATELY UPSTREAM OF BARDWELL DAM RD NEAR BARDWELL TX

## **0816**

10980—LAKE WAXAHACHIE 474 METERS NORTH AND 143 METERS EAST OF INTERSECTION OF OLD HOWARD LANE AND PENN ROAD MID LAKE NEAR DAM

## **0816A**

18571—SOUTH PRONG CREEK 35 M DOWNSTREAM OF FM 876 NEAR WAXAHACHIE TX

## **0817**

10981—NAVARRO MILLS RESERVOIR 1.94 KM WEST AND 202 METERS SOUTH OF INTERSECTION OF NW 3050 RD AND FM 667 MID LAKE NEAR DAM USGS SITE AR

17442—NAVARRO MILLS LAKE AT CITY OF CORSICANA WWTP INTAKE STRUCTURE 402 M N AND 246 M E OF INTERSECTION OF FM 667 AND NAVARRO MILLS LK DAM RD

18545—NAVARRO MILLS LAKE NEAR RICHLAND CREEK 677 M NORTH AND 1.50 KM WEST OF NW 3246 AT NW 3245 USGS SITE DC 315602096470001

18546—NAVARRO MILLS LAKE 705 M NORTH AND 409 M WEST OF RR 709 AT NW 3201 USGS SITE CC 315642096444401

18547—NAVARRO MILLS LAKE NORTHWEST END 677 M NORTH AND 1.50 KM EAST OF THE END OF NW 3270 USGS SITE EC 315706096463201

18548—NAVARRO MILLS LAKE 820 M NORTH AND 60 M EAST OF RR 709 AT NW 3208 USGS SITE BC 315710096431301

20633—NAVARRO MILLS LAKE 335 METERS SOUTH AND 410 METERS WEST TO THE INTERSECTION OF FM 667 AND NAVARRO MILLS LAKE DAM ROAD USGS SITE AC

## **0817A**

18518—RICHLAND CREEK AT FM 744 NEAR IRENE TX

18472—CEDAR CREEK RESERVOIR IN CEDAR BRANCH COVE 140 M W AND 248 M N OF WESTERN LYNNE CIRCLE/LYNNE ST INTERSECTION

18473—CEDAR CREEK RESERVOIR IN CEDAR BRANCH COVE 502 M S AND 294 M W OF WESTERN LYNNE CIRCLE/LYNNE ST INTERSECTION

**0819**

10987—EAST FORK TRINITY RIVER ON VALLEY RANCH 6.32 KM UP-STREAM OF CONFLUENCE WITH TRINITY RIVER SSE OF CRANDALL RIVER KM 7.3

10989—EAST FORK TRINITY RIVER AT THE END OF POLE BRIDGE ROAD 2.22 KM DOWNSTREAM OF FM 3039

10990—EAST FORK TRINITY RIVER AT FM 3039 RIVER KM 15.2

10991—EAST FORK TRINITY RIVER AT US 175 NW OF CRANDALL RIVER KM 20.3

10992—EAST FORK TRINITY RIVER 57 METERS DOWNSTREAM OF MALLOY BRIDGE ROAD RIVER KM 26.9

10993—EAST FORK TRINITY RIVER 2.52 KM DOWNSTREAM OF IH 20 ON FERGUSON PROPERTY 5.2 KM NNE OF SEAGOVILLE RIVER KM 30.1

10996—EAST FORK TRINITY RIVER AT US 80 NORTHWEST OF FORNEY

10997—LAKE RAY HUBBARD 300 METERS DOWNSTREAM OF DAM EAST OF DALLAS

13612—EAST FORK TRINITY RIVER IMMEDIATELY UPSTREAM OF IH 20 3.7 MI NORTH OF SEAGOVILLE

20284—EAST FORK TRINITY RIVER APPROXIMATELY 828 METERS DOWNSTREAM OF CONFLUENCE WITH DUCK CREEK EAST OF SOUTHERN EDGE OF GARLAND WWTP

20285—EAST FORK TRINITY RIVER 593 M DOWNSTREAM OF US 175 LOCATED AT A RIFFLE

20286—EAST FORK TRINITY RIVER APPROXIMATELY 2.02 KM UP-STREAM OF FM 3039 AND IMMEDIATELY UPSTREAM OF A SHEETPILE DAM

**0819A**

18558—DUCK CREEK 93 M DOWNSTREAM OF TOWN EAST BOULEVARD SOUTHWEST OF LAKE RAY HUBBARD NEAR MESQUITE TX

**0819B**

10824—BUFFALO CREEK 1.41 KILOMETERS UPSTREAM OF CONFLUENCE WITH EAST FORK TRINITY RIVER AT CITY OF FORNEY LANDFILL

18576—BUFFALO CREEK IMMEDIATELY UPSTREAM OF S FM 148 NEAR CRANDALL TX

**0820**

10998—LAKE RAY HUBBARD 1.79 KM E AND 193 METERS S OF INTERSECT GLORIA RD AND E FORK RD NEAR DALLAS WATER INTAKE STRUCTURE AT WEST END OF DAM

16809—LAKE RAY HUBBARD AT I 30 BRIDGE 766 METERS NORTH AND 1.26 KM EAST OF INTERSECTION OF CHAHA ROAD AND I 30

16829—LAKE RAY HUBBARD EAST FORK ARM AT US 66 494 M NORTH AND 1.83 KM EAST OF INTERSECTION OF US 66 AND SCENIC DRIVE WEST OF ROCKWALL

17829—LAKE RAY HUBBARD MID LAKE 1.13 KM SOUTH AND 165 METERS EAST OF INTERSECTION OF DALROCK ROAD AND COOKE DRIVE

17846—LAKE RAY HUBBARD/EAST FORK TRINITY RIVER 200 METERS DOWNSTREAM OF LAKE LAVON OUTFALL AT COLLIN CR 384

20194—LAKE RAY HUBBARD NEAR YANKEE CREEK 209 M SOUTH AND 1.50 KM EAST OF HEATH DRIVE AT DREW LANE NEAR CONROE TEXAS USGS SITE PS

**0820B**

10753—ROWLETT CREEK 75 METERS DOWNSTREAM OF SH 66 RIVER KM 1.7

17845—ROWLETT/COTTONWOOD CREEK AT SH 78 1.06 KM NORTH OF SH 190 SOUTHWEST OF SACHSE

**0820C**

16828—MUDDY CREEK AT LIBERTY GROVE ROAD 0.65KM UPSTREAM OF LAKE RAY HUBBARD

20110—MUDDY CREEK IMMEDIATELY UPSTREAM OF SACHSE ROAD APPROXIMATELY 8.3 KM UPSTREAM OF LAKE RAY HUBBARD NORMAL POOL ELEVATION IN SACHSE IN NORTHEAST DALLAS COUNTY

#### **0821**

15684—LAVON LAKE USGS SITE AL 1.39 KM NORTH AND 995 KM WEST OF INTERSECTION OF SH 78 AND SH 205

15685—LAVON LAKE USGS SITE AC 1.01 KM NORTH AND 927 METERS EAST OF INTERSECTION OF SH 78 AND SKYVIEW DRIVE NEAR DAM

15686—LAVON LAKE USGS SITE EC 1.69 KM EAST OF INTERSECTION OF BROCKDALE PARK AND COLLIN CR 967

15687—LAVON LAKE USGS SITE BC 194 METERS NORTH AND 719 METERS WEST OF INTERSECTION OF COLLIN CR 1047 AND COLLIN CR 1055

#### **0821B**

13613—SISTER GROVE CREEK IMMEDIATELY DOWNSTREAM OF FM 545 4.8 MI W OF BLUE RIDGE 3.5 MI UPSTREAM OF HATLER

#### **0821C**

10777—WILSON CREEK 45 METERS DOWNSTREAM OF US 380 WEST OF MCKINNEY

15041—WILSON CREEK 67 METERS UPSTREAM OF COLLIN CR 158

#### **0821D**

13740—EAST FORK TRINITY RIVER AT SH 5 3.3 MI NORTH OF MCKINNEY 1.7 MI UPSTREAM OF CLEMONS CREEK 750 FT DOWNSTREAM OF HONEY CREEK

#### **0822**

11024—ELM FORK TRINITY RIVER AT CARROLLTON DAM 16 METERS UPSTREAM OF SANDY LAKE ROAD

13615—ELM FORK TRINITY RIVER IMMEDIATELY DOWNSTREAM OF SH 121 1.8 MI EAST OF LEWISVILLE 1.9 MI DOWNSTREAM FROM LEWISVILLE LAKE

15252—ELM FORK TRINITY RIVER AT LEWISVILLE LAKE SPILLWAY 3 MI NORTHEAST OF LEWISVILLE

16436—ELM FORK TRINITY RIVER 46 METERS UPSTREAM OF FRASIER DAM 0.8 KM DOWNSTREAM OF SH 482 IN DALLAS TX

16437—ELM FORK TRINITY RIVER 307 METERS DOWNSTREAM OF LAKE LEWISVILLE SPILLWAY NEAR CITY OF LEWISVILLE TX

16438—ELM FORK TRINITY RIVER AT INTAKE OF DALLAS WATER UTILITIES ELM FK TREATMENT PLANT 738 M DOWNSTREAM OF CONFLUENCE WITH DENTON CK IN CARROLLTON

17162—ELM FORK TRINITY RIVER AT VALLEY VIEW LANE FROM KEENAN BRIDGE IN IRVING

17163—ELM FORK TRINITY RIVER IMMEDIATELY UPSTREAM OF STATE SPUR 348/NORTHWEST HIGHWAY IN IRVING

17164—ELM FORK TRINITY RIVER AT PROCTOR STREET 143 METERS UPSTREAM OF SH 183 IN DALLAS

18310—ELM FORK TRINITY RIVER IMMEDIATELY DOWNSTREAM OF EAST IRVING BOULEVARD 502 M DOWNSTREAM OF SH 356 IN IRVING

18358—ELM FORK TRINITY RIVER IMMEDIATELY DOWNSTREAM OF HEBRON PARKWAY SOUTHEAST OF LEWISVILLE TR255

18648—ELM FORK TRINITY RIVER EAST BANK IMMEDIATELY UPSTREAM OF SH 482 SPUR/STOREY LANE IN DALLAS

20287—ELM FORK TRINITY RIVER AT WILDWOOD DRIVE-TOM BRANIFF DRIVE IN DALLAS

#### **0822A**

17165—COTTONWOOD BRANCH IMMEDIATELY UPSTREAM OF NORTH BELTLINE ROAD IN IRVING

17166—COTTONWOOD BRANCH AT NORTH STORY ROAD IN IRVING

17167—COTTONWOOD BRANCH 71 METERS UPSTREAM OF NORTH MACARTHUR BOULEVARD IN IRVING

17168—COTTONWOOD BRANCH AT SH SPUR 348/NORTHWEST HIGHWAY IN IRVING

18359—COTTONWOOD BRANCH 433 M UPSTREAM OF NORTH MACARTHUR BLVD AT CONCRETE COVERED PIPE CROSSING



**0822B**

17169—GRAPEVINE CREEK 30 METERS DOWNSTREAM OF EAST BELT-LINE ROAD IN IRVING

17531—GRAPEVINE CREEK AT NORTH AIRFIELD DRIVE IMMEDIATELY DOWNSTREAM OF BRIDGE IN GRAPEVINE

17939—GRAPEVINE CREEK 210 METERS UPSTREAM OF REGENT BOULEVARD AND 535 M UPSTREAM OF IH 635 IN IRVING

**0822C**

17170—HACKBERRY CREEK AT COLWELL BOULEVARD IN IRVING

17171—HACKBERRY CREEK AT VALLEY VIEW LANE/SH 161 IN IRVING

17172—HACKBERRY CREEK AT CABELL ROAD IN IRVING

17532—HACKBERRY CREEK AT NORTH BELTLINE ROAD IMMEDIATELY DOWNSTREAM OF BRIDGE AND NORTH OF CABELL DRIVE IN IRVING

17938—HACKBERRY CREEK AT PARKRIDGE BOULEVARD 330 M UPSTREAM OF SH 161 IN IRVING

**0822D**

17849—SKI LAKE NEAR BARCHMAN TREATMENT PLANT INTAKE 543 METERS SOUTH AND 99 METERS WEST OF INTERSECTION OF SH 482 AND I 35 EAST

**0823**

11025—LEWISVILLE LAKE MID LAKE NEAR DAM

11026—LEWISVILLE LAKE ELM FORK ARM 170 METERS NORTH AND 1.58 KM EAST OF INTERSECTION OF HUNDLEY AND MARINA DRIVE

11027—LEWISVILLE LAKE AT I 35E IN THE HICKORY CREEK ARM 681 METERS NORTH OF INTERSECTION OF I 35E AND COPPERAS BRANCH ROAD

13995—LEWISVILLE LAKE USGS SITE AL 638 METERS NORTH AND 1.21 KM EAST OF INTERSECTION OF JONES STREET AND KEALY STREET

13996—LEWISVILLE LAKE USGS SITE AC 948 METERS NORTH AND 2.53 KM EAST OF INTERSECTION OF JONES STREET AND KEALY STREET

13997—LEWISVILLE LAKE USGS SITE BC 1.71 KM NORTH AND 1.68 KM WEST OF INTERSECTION OF HILLPARK ROAD AND KINE PAC ROAD

13998—LEWISVILLE LAKE USGS SITE CC 895 METERS NORTH AND 499 METERS WEST OF INTERSECTION OF HIGHLAND VILLAGE ROAD AND SELLMEYER LANE

13999—LEWISVILLE LAKE USGS SITE FC 1.16 KM SOUTH AND 235 METERS WEST OF INTERSECTION OF SHADY LANE AND GARZA LANE

14001—LEWISVILLE LAKE USGS SITE GC 780 METERS NORTH AND 782 METERS EAST OF INTERSECTION OF PENINSULA BOULEVARD AND PARADISE COVE

16808—LAKE LEWISVILLE IN STEWART CREEK ARM AT FM 423 BRIDGE 389 METERS NORTH OF INTERSECTION OF OVERLAKE DRIVE AND FM 423/MAIN STREET

17830—LEWISVILLE LAKE NEAR LITTLE ELM CREEK ARM 1.82 KM SOUTH AND 2.85 KM WEST OF INTERSECTION OF HIDDEN COVE AND HACKBERRY CREEK PARK

18475—LAKE LEWISVILLE IN HICKORY CREEK IMMEDIATELY UPSTREAM OF OLD ALTON ROAD SOUTH OF DENTON

18476—LAKE LEWISVILLE IN HICKORY CREEK CHANNEL 260 M N OF THE END OF BISHOP LANE AND APPROXIMATELY 6.2 KM UPSTREAM OF IH35

18477—LAKE LEWISVILLE IN HICKORY CREEK ARM 685 M N AND 240 M W OF THE END OF HIDDEN HILLS ROAD AND APPROXIMATELY 5.3 KM UPSTREAM OF IH35

18478—LAKE LEWISVILLE IN HICKORY CREEK ARM 272 M S AND 198 M W OF THE END OF HIDDEN HILLS ROAD AND APPROXIMATELY 4.3 KM UPSTREAM OF IH35

18479—LAKE LEWISVILLE IN HICKORY CREEK ARM 2.9 KM W OF IH35E CENTER BRIDGE

18480—LAKE LEWISVILLE IN PECAN CREEK SLOUGH 550 M W AND 415 M N OF THE END OF NORTH GARZA ROAD

18481—LAKE LEWISVILLE IN PECAN CREEK SLOUGH 337 N AND 362 M E OF THE END OF NORTH GARZA ROAD

20893—LEWISVILLE LAKE HICKORY CREEK ARM APPROX 1.96 KM DOWNSTREAM OF OLD ALTON ROAD

**0823A**

13617—LITTLE ELM CREEK AT FM 1385 5.5 MI EAST OF AUBREY 1.5 MI UPSTREAM FROM MUSTANG CREEK

16826—LITTLE ELM CREEK AT UPPER BRANCH CROSSING OF FM 1385 APPROX 12 KM UPSTREAM OF LEWISVILLE LAKE

**0823B**

10860—STEWART CREEK AT FOURTH ARMY MEMORIAL DRIVE WEST OF FRISCO

**0823C**

16827—CLEAR CREEK AT I 35 WEST OF US 377 APPROX 24.7 KM UPSTREAM OF LEWISVILLE LAKE SOUTH OF SANGER

**0823D**

18560—DOE BRANCH AT FISHTRAP ROAD NEAR PROSPER TX

20291—DOE BRANCH AT US 380 NEAR PROSPER

**0824**

11029—ELM FORK TRINITY RIVER NEAR TERRAPIN HILL 3.05 KM DOWNSTREAM FROM CONFLUENCE WITH UNNAMED TRIBUTARY SOUTH OF GAINESVILLE

11031—ELM FORK TRINITY RIVER IMMEDIATELY DOWNSTREAM OF FM 2071 SOUTH OF GAINESVILLE

11033—ELM FORK TRINITY RIVER AT COOKE CR 239 1.38 KM DOWNSTREAM OF GAINESVILLE WWTP

15635—ELM FORK TRINITY RIVER 59 METERS DOWNSTREAM OF FM 51 IN GAINESVILLE

16432—ELM FORK TRINITY RIVER AT FM 3108 1.2KM SOUTH OF INTERSECTION OF FM 3108 AND SH 82 IN LINDSAY TX

17670—ELM FORK TRINITY RIVER AT IH 35 DOWNSTREAM OF FM 51 IN GAINESVILLE

**0825**

11034—DENTON CREEK IMMEDIATELY DOWNSTREAM OF SH 121 SOUTH OF LEWISVILLE

14244—DENTON CREEK 41 METERS UPSTREAM OF DENTON TAP ROAD 2 MI NORTH OF COPPELL

**0826**

11036—GRAPEVINE RESERVOIR AT MOREHEAD CREEK COVE 443 METERS NORTH AND 120 METERS EAST OF INTERSECTION OF PARK ROAD 8 AND DOOLEY STREET

11037—GRAPEVINE RESERVOIR AT MOREHEAD CREEK COVE 177 METERS WEST OF INTERSECTION OF PARK ROAD 9 AND MURRELL DRIVE

13873—GRAPEVINE LAKE USGS SITE AR 957 METERS NORTH AND 953 METERS WEST OF INTERSECTION OF SH 26 AND BASS PRO ROAD

13874—GRAPEVINE LK SITE AC USGS 325822097030401 LOCATION MATCHES USGS SITE MAP 598 M S AND 645 M E INTERSECTION OF DALTONS RD AND FAIRWAY DR

13875—GRAPEVINE LAKE USGS SITE BC 753 METERS SOUTH AND 484 METERS WEST OF INTERSECTION OF WEST MURREL PARK ROAD AND SIMMONS ROAD

13876—GRAPEVINE LK SITE CC USGS 325933097081401 LOCATION MATCHES USGS SITE MAP 997 M S AND 32 M E OF INTERSECT OF HARBOR HAVEN AND BURNEY LN

13877—GRAPEVINE LAKE USGS SITE DC 305 METERS SOUTH AND 1.21 KM WEST OF INTERSECTION OF HIGH ROAD AND BOLO LANE

13878—GRAPEVINE LAKE USGS SITE EC 381 METERS SOUTH AND 211 METERS WEST OF INTERSECTION OF CHEYENNE ROAD AND POCOHONTAS DRIVE

16111—GRAPEVINE LAKE MID LAKE BETWEEN SAM BASS CAVE AND MARSHALL CREEK PARK 16 METERS S AND 597 M W OF INTERSECTION OF BOLO LN AND HIGH ROAD

16112—GRAPEVINE LAKE MID LAKE BETWEEN WALNUT GROVE PARK AND RED BUD PT 882 M N AND 1.39 KM E OF INTERSECTION OF BOB JONES RD AND SADDLE RIDGE

16113—GRAPEVINE LAKE NEAR INTAKE STRUCTURE AT NORTH END OF DAM 548 METERS N AND 99 METERS EAST OF INTERSECTION OF FAIRWAY DR AND DALTONS DR

16114—GRAPEVINE LAKE MID LAKE NORTH OF OAK GROVE PARK 1.26 KM NORTH AND 269 METERS EAST OF INTERSECTION OF MESQUITE BEND AND PARK ROAD

16115—GRAPEVINE LAKE MID LAKE BETWEEN MEADOWMERE PARK TWIN COVES PARK 1.29 KM N AND 80 METERS EAST OF INTERSECTION OF PARK ROADS 16 AND 17

16116—GRAPEVINE LAKE AT MOUTH OF NORTH MAIN SLOUGH COVE 749 METERS N AND 149 METERS W OF INTERSECTION OF OAK GROVE PARK RD AND DOVE LOOP RD

16117—GRAPEVINE LAKE AT UPSTREAM END OF NORTH MAIN SLOUGH COVE 104 METERS N AND 674 M W OF INTERSECTION OF OAK GROVE PARK RD AND DOVE LOOP RD

16118—GRAPEVINE LAKE IN MCPHERSON SLOUGH COVE SOUTH OF OAK GROVE PARK 320 METERS NORTH AND 132 METERS WEST OF PARK ROADS 8 AND 9

17827—GRAPEVINE LAKE AT DALLAS WATER UTILITIES INTAKE 349 METERS NORTH AND 328 METERS EAST OF INTERSECTION OF SILVER-SIDE DR AND PARK ROAD 7

17828—GRAPEVINE LAKE AT LITTLE PETES MARINA 392 METERS NORTH AND 136 METERS EAST OF INTERSECTION OF THOUSAND OAKS COURT AND CARMEL COURT

20880—GRAPEVINE LAKE CATES BRANCH COVE UPPER END OF COVE APPROX 1.0 KILOMETERS DOWNSTREAM OF WICHITA TRAIL AND APPROX 64 METERS NORTH AND 380 METERS WEST OF THE INTERSECTION OF BREAKER LANE AND PENINSULA DRIVE

20881—GRAPEVINE LAKE CATES BRANCH COVE MIDDLE OF COVE APPROX 1.72 KILOMETERS DOWNSTREAM OF WICHITA TRAIL AND APPROX 6 METERS SOUTH AND 227 METERS EAST OF THE INTERSECTION OF PRINCE LANE AND NOBLE WAY

20882—GRAPEVINE LAKE DENTON CREEK ARM WEST OF TROPHY PARK DRIVE APPROX 40 METERS NORTH OF THE TROPHY CREEK PARK DRIVE BOAT RAMP AND APPROX 5.84 KM DOWNSTREAM OF US 377

20883—GRAPEVINE LAKE DOVE CREEK COVE UPPER END OF COVE APPROX 190 METERS UPSTREAM OF SOUTHERNMOST BOAT DOCK ON

EAST SIDE OF COVE WEST OF PENINSULA DRIVE AND APPROX 670 METERS NORTH AND 115 METERS EAST OF THE INTERSECTION OF W KIMBALL AVENUE AND MEADOWMERE LANE

20886—GRAPEVINE LAKE MOREHEAD CREEK COVE MIDDLE OF COVE APPROX 370 METERS SOUTH AND 90 METERS EAST OF THE INTERSECTION OF FARRIS BRANCH DRIVE AND OAK GROVE LOOP S

20887—GRAPEVINE LAKE MCPHERSON SLOUGH COVE UPPER END OF COVE NEAR CREEK MOUTH APPROX 790 METERS UPSTREAM OF NEAREST BOAT DOCKS ON EAST SIDE OF COVE OFF OF BOATHOUSE DRIVE AND APPROX 270 METERS SOUTH AND 230 METERS EAST OF THE INTERSECTION OF WHITE OAK DRIVE AND

20889—GRAPEVINE LAKE SILVER CREEK COVE UPPER END OF COVE APPROX 270 METERS UPSTREAM OF GAYLORD TRAIL AND APPROX 165 METERS NORTH AND 210 METERS EAST OF THE INTERSECTION OF WILDWOOD DRIVE AND RUTH WALL ROAD

20890—GRAPEVINE LAKE SILVER CREEK COVE MID-UPPER END OF COVE JUST UPSTREAM OF GAYLORD TRAIL

20891—GRAPEVINE LAKE SILVER CREEK COVE MIDDLE OF COVE APPROX 160 METERS DOWNSTREAM OF GAYLORD TRAIL AND APPROX 560 METERS NORTH AND 355 METERS EAST OF THE INTERSECTION OF WILDWOOD DRIVE AND RUTH WALL ROAD

#### **0826A**

14483—DENTON CREEK AT FM 156 2.4 MILES NORTH OF JUSTIN

14485—DENTON CREEK AT US 377 WEST OF LAKE GRAPEVINE

#### **0826C**

16825—HENRIETTA/ELIZABETH CREEK 114 METERS UPSTREAM OF SH 114 UPSTREAM LAKE GRAPEVINE NORTHWEST OF ROANOKE

#### **0836**

11065—RICHLAND-CHAMBERS RESERVOIR MID LAKE AT DAM 1.36 KM WEST AND 1.57 KM SOUTH OF INTERSECTION OF US 287 AND FM 488

11068—RICHLAND-CHAMBERS RESERVOIR RICHLAND CREEK ARM MID LAKE 2.24 KM SOUTH AND 276 METERS EAST OF INTERSECTION OF PETTY RD AND SE 2230 RD



15168—RICHLAND-CHAMBERS RESERVOIR AT NORTH END OF DAM 332 METERS SOUTH AND 555 METERS WEST OF INTERSECTION OF US 287 AND RR 488

15169—RICHLAND-CHAMBERS RESERVOIR 1.95 KM NORTH AND 2.26 KM WEST OF INTERSECTION OF SE 3190 ROAD AND OLD HIGHWAY 287

15170—RICHLAND-CHAMBERS RESERVOIR CHAMBERS CREEK ARM NEAR TCWCID 1 PUMP STATION 570 M S AND 1.16 KM W OF INTERSECT OF SE 3240 AND SE 3250

15172—RICHLAND-CHAMBERS RESERVOIR IN UPPER END OF RICHLAND CREEK ARM 2.01 KM S AND 150 METERS E OF INTERSECTION OF NAVARRO SLAB AND SE 1095

15199—RICHLAND-CHAMBERS RESERVOIR UPPER END OF CHAMBERS CREEK ARM 2.52 KM NORTH AND 329 METERS WEST OF INTERSECTION OF WICHITA TRL AND FM 637

18720—RICHLAND-CHAMBERS RESERVOIR AT THE WESTMOST CONCRETE SECTION OF THE BOAT RAMP OFF SE 3130

18723—RICHLAND-CHAMBERS RESERVOIR IN POST OAK CREEK CHANNEL 515 M S AND 1.43 KM E OF S END OF SE 0070

18724—RICHLAND-CHAMBERS RESERVOIR 154 M S AND 72 M W OF S END OF SE 0070 AT N SIDE OF SMALL UNNAMED ISLAND

18727—RICHLAND-CHAMBERS RESERVOIR 1.62 KM S AND 2.59 KM E OF IH 45 AT FM 1394 AND 150 M E OF RICHLAND CREEK MOUTH

#### **0836B**

18716—CEDAR CREEK 1.06 MI UPSTREAM OF SE 3130

18718—CEDAR CREEK 340 M UPSTREAM OF SE 3130

18719—CEDAR CREEK AT SE 3130 BRIDGE WEST OF THE BOAT RAMP

#### **0836C**

18721—GRAPE CREEK AT SE 1090 BRIDGE APPROXIMATELY 1 MI UPSTREAM OF THE MOUTH OF COVE NORTH OF CHENEYBORO

#### **0836D**

18722—POST OAK CREEK 1.25 KM DOWNSTREAM OF SE 0050 45 M DOWNSTREAM OF SMALL UNNAMED STREAM CONFLUENCE AND UPSTREAM OF PIPELINE

#### **0837**

11070—RICHLAND CREEK 60 METERS DOWNSTREAM OF FM 709 2.8 KM UPSTREAM OF RICHLAND CHAMBERS RESERVOIR

18344—RICHLAND CREEK USGS STATION 38 M DOWNSTREAM OF SH 31 NEAR NAVARRO MILLS LAKE

#### **0839**

13619—ELM FORK TRINITY RIVER 336 METERS DOWNSTREAM OF RAY ROBERTS DAM 5.7 MI SW OF PILOT POINT 3.3 MI UPSTREAM FROM BRAY BRANCH

#### **0839A**

10859—CLEAR CREEK 80 METERS UPSTREAM OF FM 455 WEST OF SANGER

13618—CLEAR CREEK AT COWLING ROAD 1.8 MI SOUTH OF SANGER 1350 FT DOWNSTREAM OF DUCK CREEK

#### **0840**

11076—RAY ROBERTS LAKE ISLE DU BOIS CREEK ARM WEST OF JORDAN PARK 2.84 KM N AND 599 M W OF INTERSECTION OF ISLE DU BOIS PARK RD AND QUAIL RUN

14039—RAY ROBERTS LAKE USGS SITE AC 98 METERS NORTH AND 1.26 KM WEST OF INTERSECTION OF FM 455 AND LAKE RAY ROBERTS ROAD

16822—RAY ROBERTS LAKE BUCK CREEK COVE AT US377 BRIDGE 1.06 KM N AND 428 M E OF INTERSECTION OF US 377 AND EMBERSON CHAPEL RD SW OF SHERMAN

16823—RAY ROBERTS LAKE IN RANGE CREEK COVE AT US 377 BRIDGE 600 M SOUTH AND 57 M WEST OF INTERSECTION OF PATTON RD AND US 377 SW OF SHERMAN

16824—RAY ROBERTS LAKE AT FM 3002 377 METERS NORTH AND 1.25  
KM EAST OF INTERSECTION OF FM 3002 AND MANN ROAD 13 MI SOUTH  
OF GAINESVILLE

17834—RAY ROBERTS LAKE AT DALLAS WATER UTILITIES INTAKE W  
SIDE OF DAM 1.02 KM N AND 232 METERS E OF INTERSECTION OF  
BURGER RD AND FM 2153

20897—RAY ROBERTS LAKE LICK CREEK COVE MID-UPPER END OF  
COVE APPROX 430 METERS SOUTH AND 485 METERS EAST OF THE IN-  
TERSECTION OF UNION GROVE ROAD AND COUNTY ROAD 3002/E LONE  
OAK ROAD

20899—RAY ROBERTS LAKE WALNUT CREEK COVE MID-UPPER END OF  
COVE JUST UPSTREAM OF FM 372

# THE TEXAS --- CLEAN --- RIVERS --- PROGRAM

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