

TMDLs for Chlorides, Sulfates, Total Dissolved Solids and Turbidity for Selected Subsegments in the Red River Basin, Louisiana (100406, 100708, 100710, 100804, 101101, 101103, 101303, 101401)

Fact Sheet

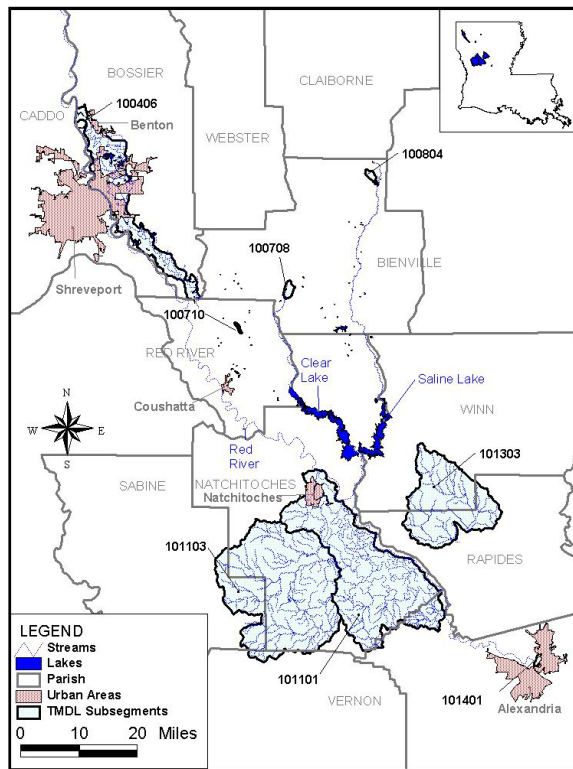


Figure 1. Location of the impaired subsegments in the Red River Basin

Section 303(d) of the Clean Water Act and the U.S. Environmental Protection Agency’s Water Quality Planning and Management Regulations require states to develop Total Maximum Daily Loads (TMDLs) for waterbodies that are not meeting water quality standards. A TMDL establishes the amount of a pollutant that a waterbody can assimilate without exceeding its water quality standard for that pollutant. TMDLs provide the scientific basis for a state to establish water quality-based controls to reduce pollution from both point and nonpoint sources to restore and maintain the quality of the state’s water resources.

A TMDL for a given pollutant and waterbody is composed of the sum of individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background levels. In addition, the TMDL must include an implicit or explicit margin of safety (MOS) to account for the uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody and may include a future growth (FG) component.

This fact sheet presents a summary of the TMDLs that have been developed for chlorides, sulfates, total dissolved solids (TDS) and turbidity for eight subsegments in the Red River Basin in northwestern Louisiana. All the subsegments flow to the Red River, which enters northwestern Louisiana from Arkansas and flows southward to Shreveport. These TMDLs address the portion of the river from the Arkansas state line to the city of Alexandria, Louisiana (Figure 1).

Louisiana Department of Environmental Quality (LDEQ) included the eight subsegments in the Red River Basin on the state’s 2004 section 303(d) list for various impairments (Table 1).

Table 1. Section 303(d) listing for subsegments in the Red River Basin

Subseg. number	Subseg. name	Impaired use ^a	Causes of impairment				Suspected sources of impairment
			Chloride	Sulfate	TDS	Turbidity	
100406	Flat River	PCR, FWP			X		Residential districts
100708	Castor Creek tributary	FWP		X	X		Natural conditions—Water quality standards use attainability analyses needed
100710	Grand Bayou tributary	FWP	X	X	X		Municipal point source discharges
100804	Saline Bayou tributary	FWP		X	X		Municipal point source discharges
101101	Cane River	FWP, DWS	X		X		Natural conditions—Water quality standards use attainability analyses needed
101103	Bayou Kisatchie	PCR, FWP			X		Natural conditions—Water quality standards use attainability analyses needed
101303	Iatt Creek	FWP			X		Natural conditions—Water quality standards use attainability analyses needed
101401	Buhlow Lake	FWP				X	Natural conditions—Water quality standards use attainability analyses needed

^a PCR = primary contact recreation; FWP = fish and wildlife propagation; DWS = drinking water supply

The numeric water quality criteria that apply to the impaired subsegments and that were used to calculate the TMDLs are presented in Table 2. Because turbidity cannot be expressed as a mass load, the turbidity TMDL was expressed using total suspended solids (TSS) as a surrogate for turbidity. Historical water quality data for subsegment 101401 were analyzed for relationships between turbidity and TSS, and a regression between turbidity and TSS was developed for that subsegment resulting in a surrogate TSS endpoint of 18 mg/L.

Table 2. Numeric water quality criteria for the listed subsegments

Subsegment number	Subsegment name	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Turbidity (NTU)
100406	Flat River			300	
100708	Castor Creek tributary		9	79	
100710	Grand Bayou tributary	26	9	79	
100804	Saline Bayou tributary		20	250	
101101	Cane River	25		100	
101103	Bayou Kisatchie			100	
101303	Iatt Creek			100	
101401	Buhlow Lake				25

The TMDLs were developed using the load duration curve methodology. This method illustrates allowable loading at a wide range of streamflow conditions. The steps for applying this methodology were (1) developing a flow duration curve; (2) converting the flow duration curve to load duration curves; (3) plotting observed loads with load duration curves; (4) calculating the TMDL, MOS, FG, WLA and LA; and (5) calculating percent reductions.

In TMDL development, allowable loadings from all pollutant sources that cumulatively amount to no more than the TMDL must be established and thereby provide the basis for establishing water quality-based controls. WLAs were given to permitted point source discharges. The LAs include background loadings and human-induced nonpoint sources. An explicit MOS of 10 percent and an FG component of 10 percent were included. A summary of the TMDLs for each of the subsegments is presented in Tables 3 and 4.

Table 3. Summary of chloride and sulfate TMDLs, MOS, FG, WLAs and LAs for the Red River Basin

Subsegment	Station	Pollutant	Percent reduction	Total allowable load	Explicit MOS (10%)	Future growth (10%)	Σ WLA	Σ LA
				kg/day				
100710	1195	Chloride	59.2	10.24	1.02	1.02	4.92	3.27
101101	1217	Chloride	51.9	2,374.26	237.43	237.43	80.78	1,818.63
100708	1194	Sulfate	54.5	10.88	1.09	1.09	1.70	7.00
100710	1195	Sulfate	85.9	3.54	0.35	0.35	1.70	1.13
100804	1206	Sulfate	0.0	51.33	5.13	5.13	37.85	3.21

Table 4. Summary of TDS and TSS TMDLs, MOS, FG, WLAs, and LAs for Red River Basin

Subsegment	Station	Pollutant	Percent reduction	Total allowable loading	Explicit MOS (10%)	Future growth (10%)	Σ WLA	Σ LA
				tons/day				
100406	389	TDS	48.7	9.70	0.97	0.97	0.95	6.81
100708	1194	TDS	43.6	0.09	0.01	0.01	0.02	0.05
100710	1195	TDS	65.3	0.03	0.00	0.00	0.02	0.01
100804	1206	TDS	51.9	0.71	0.07	0.07	0.52	0.04
101101	1217	TDS	76.6	10.47	1.05	1.05	0.36	8.02
101103	42	TDS	76.7	11.34	1.13	1.13	0.00	9.08
101303	1222	TDS	63.4	4.36	0.44	0.44	0.00	3.49
101401	1223	Tur/TSS	43.3	0.04	Implicit	0.00	0.00	0.03

For More Information

EPA seeks input on this proposed TMDL, including comments, information, and data from the general and affected public. For additional information on this TMDL project, please contact the EPA staff member listed below:

Dr. Golam Mustafa, Task Order Manager, at 214-665-6576 or Mustafa.Golam@epa.gov.