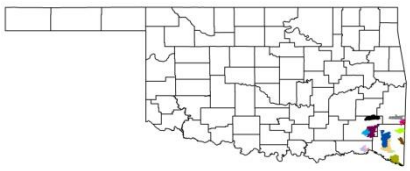
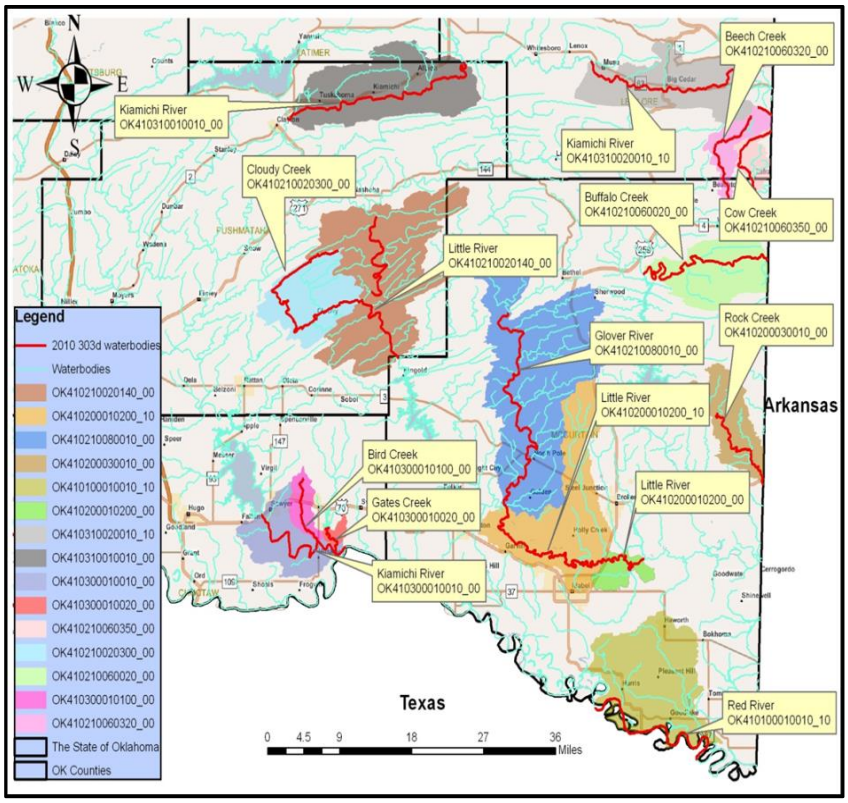
208 FACTSHEET FOR BACTERIAL AND TURBIDITY TMDLs in the OKLAHOMA LOWER RED RIVER – LITTLE RIVER BASIN STUDY AREA





Background: The TMDL study addressed bacterial and turbidity impairments in 15 waterbodies in southeastern Oklahoma.

Watershed: This TMDL Study Area was located in the Kiamichi (USGS HUC 11140105), Pecan-Waterhole (USGS HUC 11140106), Upper Little (USGS HUC 11140107), Mountain Fork (USGS HUC 11140108), and Lower Little (USGS HUC 11140109) watersheds. The Study Area covered portions of Choctaw, Latimer, LeFlore, McCurtain and Pushmataha Counties.

Beneficial Uses in This Watershed: According to Oklahoma's 2010 Integrated Report, the designated beneficial uses for the waterbodies in the Lower Red River - Little River Basin Study Area were Aesthetics (AES), Agriculture (AG), Fish & Wildlife Propagation-Warm Water Aquatic Community Subcategory (WWAC), Fish & Wildlife Propagation-Cool Water Aquatic Community Subcategory (CWAC), Fish Consumption (FISH), Primary Body Contact Recreation (PBCR), and Public & Private Water Supply (PPWS).

The rivers & creeks impaired with bacteria and turbidity in this Study Area, according to Oklahoma's 2010 303(d) list, are shown in the green-shaded area of the following table with an "**x**" indicating the type of bacteria and/or turbidity for which the Integrated Report said it is impaired.

Between 2001 – 2008, 246 bacterial samples were collected for the waterbodies in the Study Area. Between 1998 – 2012, 455 turbidity samples were collected in the Study Area. For this study, the water quality data generated by all of these samples was analyzed to find out if the waterbodies in the Study Area were impaired for bacteria or turbidity thus necessitating a TMDL. The water quality data examined to make these determinations can be found in Appendix A of the "**2014 Bacterial and Turbidity TMDL Report for the Lower Red River - Little River Basin Study Area**".

The results of the data analyses are also summarized in the following table. An "**x**" in the tan-shaded area indicates that the sampling data showed that the waterbody was found to be impaired for bacteria or turbidity so a TMDL was developed. Samples on the Little River (OK410200010200_00) were collected in a mixing zone. According to Implementation of Oklahoma's Water Quality Standards [Title 785, Chapter 46-15-3(b)(5)], 'Samples and other data shall not be taken within any regulatory mixing zone." Therefore, the Little River (OK410200010200_00) was not assessed as impaired. For Little River (OK410210020140_00), a TMDL was already developed for Enterococci in 2007. The hyperlink will take you to that TMDL report at the DEQ webpage ("*Bacterial TMDL in the Little River Area*").

WBID	Waterbody Name	Waterbody Impairments from the 2010 303(d) List			TMDLs needed after sampling results analyzed		
		Enterococci	E-Coli	Turbidity	Enterococci	E-Coli	Turbidity
OK410100010010_10	Red River			X			X
OK410200010200_00	Little River			X	Mixing zone data		
OK410200010200_10	Little River			X			X
OK410200030010_00	Rock Creek			X			X
OK410210020140_00	Little River	X		X	Done 2007		X
OK410210020300_00	Cloudy Creek			X			X
OK410210060020_00	Buffalo Creek			X			X
OK410210060320_00	Beech Creek			X			X
OK410210060350_00	Cow Creek			X			X
OK410210080010_00	Glover River			X			X
OK410300010010_00	Kiamichi River	X			X		
OK410300010020_00	Gates Creek			X			X
OK410300010100_00	Bird Creek			X			X
OK410310010010_00	Kiamichi River	X			X		
OK410310020010_10	Kiamichi River	X			X		

Possible Sources of Impairments:

Point sources:

- **NPDES regulated** municipal **and** industrial **wastewater treatment facilities (WWTF):** There aren't any municipal wastewater facilities discharging into the Lower Red River - Little River Basin Study Area. There are two industrial facilities in the Lower Red River - Little River Basin Study Area.: Tyson Foods, Inc. - Broken Bow (OK0000795) and Western Farmers Electric Cooperative-Hugo plant (OK0035327).

- **NPDES regulated stormwater discharges:** DEQ regulates stormwater discharges from Municipal Separate Storm Sewer Systems (MS4s), industrial sites, and construction sites.

  - **NPDES regulated stormwater discharges through Municipal Separate Storm Sewer Systems:** There aren't any Phase I or Phase II (OKR04) MS4s in the Study Area.

  - **Industrial Sites (OKR05):** These two facilities in the Lower Red River – Little River Basin Study Area have a Multi-Sector General Permit (MSGP): Meridian Aggregates Co (OKR050878) in the Little River (OK410200010200_10) watershed and Tyson Foods (OKR050522) in the Little River (OK410200010200_00) watershed.

  - **Construction Sites (OKR10):** There were three OKR10 permits for construction projects in the Lower Red River – Little River Basin Study Area during the time period when water samples were taken. These were ODOT JP #18849(04) (OKR107548) in the Kiamichi River (OK410300010010_00) watershed, ODOT JP #18851(04) (OKR106906) in the Bird Creek (OK410300010100_00) watershed and The Woodlands (OKR107418) in the Little River (OK410200010200_00) watershed.

- **Rock, Sand, and Gravel Quarries:** There aren't any rock, sand, or gravel quarries in the Study Area.

- **NPDES regulated Concentrated Animal Feeding Operations (CAFOs):** There aren't any CAFOs in the Study Area, but there are 44 Poultry Feeding Operations (PFO) with 3,046,700 birds in McCurtain County.

- Sanitary Sewer Overflows **(SSO) and No-Discharge Facilities**: There aren't any no-discharge facilities or SSOs in the Study Area.

Nonpoint sources - The nonpoint sources examined in this Study Area were:

- **Wildlife:** It is difficult to assess the magnitude of bacteria contributions from wildlife species as a general category. Since there is adequate data regarding the number of deer in each county, the number of deer is used to represent wildlife in general. By using the count of deer in each county and the percentage of the watershed area within each county, a wild deer population is calculated for each watershed. There are approximately 3,338 deer in the Lower Red River – Little River Basin Study Area. This is an average deer per acre rate ranging from 0.0027 [Buffalo Creek (OK410210060020_00)] - 0.0080 [Gates Creek (OK410300010020_00)]. At this minimal concentration, wildlife is considered to be a minor contributor of bacteria in the watersheds.

- **Farm Animals:** Examples of livestock activities that could result in bacteria getting into creeks, streams, and rivers include:

  - Processed manure from livestock operations such as poultry facilities. This manure is often applied to fields as fertilizer and can contribute to fecal bacteria loading to waterbodies if washed into streams by runoff.

  - Livestock grazing in pastures during which manure containing fecal bacteria could be deposited onto land surfaces which may be washed into waterbodies by runoff.

  - Direct access to waterbodies by livestock: In the bacterially-impaired watersheds of the Lower Red River – Little River Basin Study Area, cattle (an estimated 12,309 head) generate the largest amount of fecal coliform and often have direct access to streams and tributaries.

- **Failing Septic Systems:** It is estimated that there are 398 failing septic systems in the Lower Red River - Little River Basin Study Area.

- **Pets:** Based on national averages, it is estimated that there are about 3,094 dogs and 3,488 cats in the Lower Red River - Little River Basin Study Area.

The three watersheds in the Study Area that required bacterial TMDLs were segments of the Kiamichi River that has no continuous, permitted point sources of bacteria and no animal feeding operations. The Enterococci impairment for these segments of the Kiamichi River almost certainly comes from nonpoint sources.

Of the eleven watersheds in the Study Area that required turbidity TMDLs, only one of them - Bird Creek (OK410300010100_00) - had an industrial source that could contribute TSS [Western Farmers Electric Cooperative-Hugo plant (OK0035327)]. However, the turbidity impairment status is limited to base flow conditions and stormwater discharges from the facilities do not contribute to the violation of Oklahoma's turbidity standard. Therefore, WFEC_Hugo plant will not receive a WLA for TSS on Bird Creek (OK410300010100_00) because that discharge is only stormwater.

The Little River (OK410200010200_10) watershed has dewatering discharges from Meridian Aggregates Co (OKR050878) for which they were given a WLA.

There was a permitted construction project in the Little River (OK410200010200_10) from 2008 – 2009 and another permitted construction project in Bird Creek in 2008 that could have resulted in some TSS getting into those waterbodies. But that loading should be minimal since those stormwater dischargers had a TSS limit in their stormwater permit and must use BMPs to prevent sediment from leaving their site and entering a waterbody. Therefore, nonpoint sources were thought to be most responsible for the TSS impairments in these watersheds.

In summary, nonpoint sources were determined to be the most likely sources of bacterial and turbidity loading into Study Area waterbodies.

TMDLs:

The TMDLs were calculated using load duration curves. The following table indicates the percentage that the pollutant will need to be reduced [percent reduction goal (PRG)] in order for that waterbody to not be impaired and meet its designated beneficial use:

WBID	Waterbody Name	These impairments must be reduced by the following amounts in order to meet water quality standards.	
		Enterococci	Turbidity
OK410100010010_10	Red River		57.8%
OK410200010200_10	Little River		65.7%
OK410200030010_00	Rock Creek		51.6%
OK410210020140_00	Little River	TMDL done in 2007	67.3%
OK410210020300_00	Cloudy Creek		46.5%
OK410210060020_00	Buffalo Creek		56.0%
OK410210060320_00	Beech Creek		78.0%
OK410210060350_00	Cow Creek		78.0%
OK410210080010_00	Glover River		64.3%
OK410300010010_00	Kiamichi River	17.0%	
OK410300010020_00	Gates Creek		73.1%
OK410300010100_00	Bird Creek		82.6%
OK410310010010_00	Kiamichi River	45.3%	
OK410310020010_10	Kiamichi River	36.9%	

The TMDLs include this waste load allocation:

Waterbody ID & Waterbody Name	NPDES Permit No.	Name	Average Monthly Flow (mgd)	Effluent TSS Target (mg/L)	Wasteload Allocation (lb/day)
OK410200010200_10 Little River	OKR050878	Meridian Aggregates Co	0.01 [a]	**40**	3.34

[a] Flow was assumed equal to 0.01 MGD for allocation purposes.

A TSS limit more stringent than 45 mg/L is needed for Meridian Aggregates Co because it has mine dewatering discharges into a tributary of the Little River (OK410200010200_10). According to the Oklahoma WQS [785:45-5-12(f)(7)(A)(iii)], turbidity in that tributary cannot exceed 50 NTUs. Since the Little River is impaired for turbidity, Meridian Aggregates Co. was given an effluent TSS wasteload allocation of 40 mg/L. Based on the turbidity/TSS correlation, 50 NTUs is equal to 40 mg/L TSS. Meridian Aggregates Co. is already required to submit Discharge Monitoring Reports according to their MSGP. They have also developed and submitted their Storm Water Pollution Prevention Plan that includes the Best Management Practices they use to prevent turbidity impairment.

The 2014 Lower Red River – Little River Basin Study Area Bacterial and Turbidity TMDL Report can be found on the following DEQ webpage: http://www.deq.state.ok.us/WQDnew/tmdl/index.html.

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