

208 Factsheet for Bacterial TMDLs in the Arkansas-Keystone Basin Study Area

Background: The TMDL study addressed bacterial and turbidity impairments in four waterbodies in the Arkansas-Keystone Basin Study Area.

Watershed: This TMDL Study Area was located in the Lower Salt Fork Arkansas (USGS HUC 11060004) and Chikaskia (USGS HUC 11060005) Subbasins. The Study Area covers portions of Alfalfa, Garfield, Grant, and Kay Counties.

Beneficial Uses in This Watershed: According to Oklahoma's [2022 Integrated Report](#), the designated beneficial uses for the waterbodies in the Arkansas-Keystone Basin Study Area are Aesthetics (AES), Agriculture (AG), Fish & Wildlife Propagation-Warm Water Aquatic Community Subcategory (WWAC), Fish Consumption (FISH), Primary Body Contact Recreation (PBCR), and Public & Private Water Supply (PPWS).

Between 2000 – 2018, 70 bacterial samples were collected for the waterbodies in the Study Area. For this study, the water quality data generated by all of these samples was analyzed to determine that four waterbodies in the Study Area were impaired for bacteria thus necessitating a TMDL. The water quality data examined to make these determinations can be found in Appendix A of the "2024 Bacterial TMDLs for Oklahoma Streams in the Arkansas-Keystone Basin Area"

WBID	Waterbody Name	Waterbody Impairments from the 2022 303(d) List		TMDLs needed after results analyzed sampling	
		Ent	<i>E. coli</i>	Ent	<i>E. coli</i>
OK621000020040_00	Wild Horse Creek		X	X	X
OK621000020130_00	Spring Creek	X	X	X	X
OK621010010130_00	Clay Creek, West	X	X	X	X
OK621100000010_20	Chikaskia River	X		X	

Based on an assessment of water quality monitoring data for the 2022 IR, seven bacterial TMDLs are needed for the waterbodies in the Arkansas-Keystone Basin Study Area.

Possible Sources of Impairments:

Point Sources:

- **OPDES regulated municipal and industrial wastewater treatment facilities:** There are no OPDES permitted facilities in the Arkansas-Keystone Basin Study Area.
- **OPDES regulated stormwater discharges:** DEQ regulates stormwater discharges from Municipal Separate Storm Sewer Systems (MS4s), industrial sites, and construction sites.
- **MS4s:** There are no MS4s in the TMDL watersheds.
- **No-Discharge Facilities:** There are two no-discharge facilities in the Wild Horse Creek (OK621000020040_00) watershed.

- **Sanitary Sewer Overflows (SSO):** Between 1992 and 2000, 14 SSO occurrences were reported with amounts ranging from 100 to 21 million gallons
- **NPDES regulated Animal Feeding Operations (AFOs):** There are no AFOs in the TMDL watersheds.

Nonpoint Sources:

- **Wildlife:** It must be noted that no data are available in Oklahoma to estimate wildlife populations other than deer. For the four watersheds impaired for bacteria, this comes to about 2,088 deer. This is an average deer per acre rate of 0.01. At this minimal concentration, wildlife is considered to be a minor contributor of bacteria in those impaired watersheds.
- **Farm Animals:** In the four bacterially-impaired watersheds, cattle (an estimated 15,744 head) generate the largest amount of fecal coliform and often have direct access to streams and tributaries. The estimated numbers of livestock by watershed are based on the 2017 USDA county agricultural census data.
- **Pets:** Bacteria from the feces of dogs and cats can be a potential source of in-stream bacteria when it is transported to streams by runoff from urban and suburban areas. In 2020, the average number of pets per household was 1.5 dogs and 1.8 cats [American Veterinary Medical Association]. On average 45% of the nation's households own dogs and 265% own cats. Based on these averages, it is estimated that there are about 2,292 dogs and 1,589 cats in the four bacterially-impaired watersheds in the TMDL watersheds.
- **Failing Septic Systems:** If a septic system is not working properly, then raw sewage - a concentrated source of bacteria - can go directly into streams. Bacterial loading from failing septic systems can be transported to streams in a variety of ways, including runoff from surface ponding or through groundwater. Bacteria-contaminated groundwater can also enter creeks through springs and seeps. It is estimated that there are 73 failing septic systems in the four bacterially-impaired watersheds.

TMDL Calculations:

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:

Waterbody ID	Waterbody Name	Required Reduction Rate (%)	
		Enterococci	<i>E. coli</i>
OK621000020040_00	Wild Horse Creek	91.5	44.7
OK621000020130_00	Spring Creek	96.6	89.3
OK621010010130_00	Clay Creek, West	81.0	64.7
OK621100000010_20	Chikaskia River	65.1	-

No facilities were given a WLA.

The 2024 Arkansas-Keystone Basin Bacterial TMDL Report can be found on the following DEQ webpage: <https://www.deq.ok.gov/water-quality-division/watershed-planning/tmdl/>.

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