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# PUBLIC NOTICE

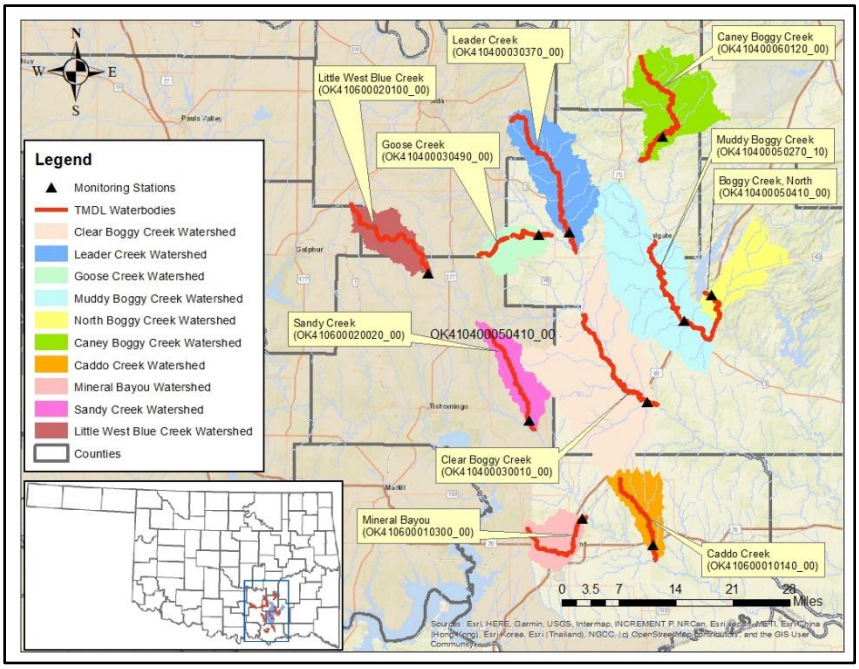
May 20, 2025

## Availability of Draft Bacterial and Turbidity TMDLs for the Red-Sulphur Subregion Study Area

### Proposed Modification to Incorporate the Red-Sulphur Subregion Study Area Bacterial and Turbidity TMDLs into Oklahoma's Water Quality Management Plan

## Request for Public Comments

## Public Comment Period Ends on Monday, July 7, 2025




The Oklahoma Department of Environmental Quality (DEQ) is seeking comments on a draft Total Maximum Daily Load (TMDL) report describing reductions of bacteria needed to improve water quality in the Red-Sulphur Subregion Study Area. This Study Area is in the south-central portion of Oklahoma in the Blue (USGS HUC 11140102), Muddy Boggy (USGS HUC 11140103), and Clear Boggy USGS HUC 11140104) Subbasins. The Study Area covers portions of Atoka, Bryan, Coal, Hughes, Johnston, Murray, Pittsburg, and Pontotoc counties. This TMDL report was based on Oklahoma's 2022 Integrated Report and 303(d) list. DEQ is also proposing to incorporate these TMDLs into Oklahoma's Water Quality Management Plan (208 Plan). The full TMDL report can be found online at: https://www.deq.ok.gov/water-quality-division/watershed-planning/tmdl/.

**Beneficial Uses:** The designated beneficial uses for the waterbodies addressed in the Red-

Sulphur Subregion Study Area TMDL contain:

- Aesthetics (AES)
- Agriculture Water Supply (AG)
- Fish & Wildlife Propagation - Warm Water Aquatic Community Subcategory (WWAC)
- Fish Consumption (FISH)
- Primary Body Contact Recreation (PBCR)
- Public & Private Water Supply (PPWS)
- Emergency Water Supply (EWS)

**Table 1** is an assessment from Oklahoma's 2022 Integrated Report (IR) on whether or not the waterbodies in the Study Area met their designated beneficial uses. The designated beneficial use addressed in the Red-Sulphur Subregion TMDL Report was PBCR:

**Table 1: Assessed Beneficial Uses for Waterbodies in the Study Area**

| Waterbody ID | Waterbody Name | AES | AG | WWAC | FISH | PBCR | PPWS | EWS |
|---|---|---|---|---|---|---|---|---|
| OK410400030010_00 | **Clear Boggy Creek** | F | I | N | F | N | I | |
| OK410400030370_00 | **Leader Creek** | I | F | N | X | N | | |
| OK410400030490_00 | **Goose Creek** | F | F | I | X | N | | |
| OK410400050270_10 | **Muddy Boggy Creek** | F | F | N | F | N | F | |
| OK410400050410_00 | **Boggy Creek, North** | N | N | N | X | N | N | |
| OK410400060120_00 | **Caney Boggy Creek** | F | F | N | X | N | I | |
| OK410600010140_00 | **Caddo Creek** | N | N | N | X | N | | |
| OK410600010300_00 | **Mineral Bayou** | F | F | N | X | N | | F |
| OK410600020020_00 | **Sandy Creek** | F | F | F | X | N | I | |
| OK410600020100_00 | **Little West Blue Creek** | F | F | F | X | N | | |

**F** – Fully supporting information | **N** – Not supporting | **I** – Insufficient | **X** – Not assessed | Source: **DEQ 2022 Integrated Report**

**Impairments:**

- **Bacteria:** The PBCR beneficial use includes swimming. If the PBCR beneficial use is not supported, that means there is too much bacteria in that waterbody. Many types of bacteria are pathogens which are things that can cause disease in animals or plants. Oklahoma WQS specify that attainment status is determined by evaluating *Escherichia coli* (*E. coli*) and Enterococci. These pathogen indicators may be found in fecal matter entering waterbodies from sources such as sewage discharges, leaking septic tanks, or runoff from animal feedlots. Therefore, they are used as a surrogate for pathogen bacteria in this TMDL. The 2022 Integrated Report indicates Enterococci impairs 4,703 miles of streams in Oklahoma, and *E. coli* impairs 2,464 miles of streams.
- **Turbidity:** When more than 10% of turbidity samples in a lake are greater than the turbidity standard (50 NTU for WWAC) based on long-term record of most recent 5 years, the Fish and Wildlife Propagation beneficial use will be considered not attained. Turbidity is a measure of water clarity, so it cannot be expressed as a mass load. Total suspended solids (TSS) are therefore modeled and evaluated as a surrogate for turbidity using a

site-specific relationship derived from TSS and turbidity measurements. Three of the ten waterbodies identified in Table 1 indicate nonsupport of the Fish and Wildlife Propagation use based on turbidity levels observed in the waterbodies. However, TMDLs were not developed because TMDLs had been established for them (2012 Bacteria and Turbidity TMDLs for the Muddy Boggy Creek Area).

**TMDL Study:** The TMDL study evaluated ten waterbodies in the Red-Sulphur Subregion Study Area that Oklahoma DEQ designated as impaired in the 2022 Integrated Report 303(d) list for nonsupport of the PBCR beneficial use. The criteria to determine if a stream is listed on the 303(d) list can be found in Implementation of Oklahoma's Water Quality Standards (Title 252, Chapter 740). The assessment protocols for *E. coli* and Enterococci bacteria are listed in the *Assessment of Primary Body Contact Recreation support* [OAC 252:740-15-6(b-c)]. The PBCR season every year is May 1 – September 30.

Water quality monitoring is conducted to see determine the impairment status of Oklahoma waterbodies. In Oklahoma, water quality monitoring is conducted by the Oklahoma Conservation Commission (OCC), the Oklahoma Water Resources Board (OWRB), and the U.S. Geological Survey (USGS). Between 2006 – 2022, 209 bacterial samples were collected for the waterbody 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 thus necessitating a TMDL. These assessments can be found in **Table 2-3** in the TMDL report, and the water quality data can be found in **Appendix A** of the TMDL report. Based on data evaluation, 11 bacterial TMDLs are needed for the waterbodies in the Study Area.

**Point Source Discharges in the TMDL Watersheds:**

- **OPDES regulated municipal and industrial wastewater treatment facilities (WWTF):** Continuous point source discharges, such as WWTFs, could result in discharge of elevated concentrations of indicator bacteria if the disinfection unit is not properly maintained, is of poor design, or if flow rates are above the disinfection capacity. There are three permitted municipal WWTFs given WLA within the Study Area (Atoka MA, Coalgate PWA, and Stringtown PWA) and five active OPDES industrial point sources that are not considered as a bacteria contributor.
- **OPDES regulated stormwater discharges:** DEQ regulates stormwater discharges from Municipal Separate Storm Sewer Systems (MS4s) for bacteria. Stormwater runoff from MS4 areas can contain high fecal coliform concentrations. But DEQ's stormwater program does not include discharges from Indian Country lands, discharges related to oil & gas extraction, or discharges associated with agricultural purposes. For details about DEQ's Stormwater Program, go to https://www.deq.ok.gov/water-quality-division/wastewater-stormwater/.
- **OPDES regulated stormwater discharges through Municipal Separate Storm Sewer Systems (MS4s):** Polluted stormwater runoff is commonly transported through MS4s, from which it is often discharged untreated into local waterbodies. Cities and towns in urbanized areas must use Best Management Practices (BMPs) to prevent harmful pollutants from being washed or dumped into local streams and lakes. They must also obtain an MS4 Permit from DEQ (OKR04). The TMDL watersheds do not have any MS4s.
- **No-Discharge Facilities**: Certain municipal facilities are classified as no-discharge. These facilities are required to sign an affidavit of no discharge. For the purposes of these TMDLs, it is assumed that no-discharge facilities (such as towns with total retention lagoons) do not contribute to bacteria getting into the waterbodies. However, it is possible that the wastewater collection systems associated with these no-discharge facilities could be a source of bacteria, or that discharges from the wastewater plant may occur during large rainfall events that exceed the systems' storage capacities. There are five no-discharge facilities in the Study Area.

- **Sanitary Sewer Overflows (SSO)**: SSOs from wastewater collection systems, although infrequent, can be a major source of indicator bacterial loading to streams. SSOs are a common result of the aging wastewater infrastructure around Oklahoma. Due to the widespread nature of the SSO problem, DEQ has focused its limited resources to first target SSOs that result in definitive environmental harm (such as fish kills) or lead to citizen complaints. All SSOs falling into these two categories are addressed through DEQ's formal enforcement process. While not all sewer overflows are reported, DEQ has some data. For example in the Red-Sulphur Subregion Study Area between 1992 and 2004, 99 SSO occurrences were reported with amounts ranging from a minimal quantity to 750,000 gallons. Details about these SSOs are summarized in **Table 3-5** of the TMDL report with specific details in **Appendix D**.
- NPDES regulated **Animal Feeding Operations (AFOs)**: The Agricultural Environmental Management Services (AEMS) is a program within the Oklahoma Department of Agriculture, Food and Forestry (ODAFF). Through regulations established by the Oklahoma Concentrated Animal Feeding Operation (CAFO) Act, Swine Feeding Operation (SFO) Act, and the Poultry Feeding Operation (PFO) Registration Act, AEMS helps develop, coordinate, and oversee environmental policies and programs aimed at protecting the Oklahoma environment from pollutants associated with agricultural animals and their waste. This is done through the use of Best Management Practices (BMPs). BMPs include dikes, berms, terraces, ditches or other similar structures used to isolate animal waste from outside surface drainage. ODAFF is the NPDES-permitting authority for CAFOs and SFOs in Oklahoma under what ODAFF calls the Agriculture Pollutant Discharge Elimination System (AgPDES). PFOs are smaller animal feeding operations so they are not required to get NPDES permits. They are only required to register with ODAFF and follow PFO rules. In the Red-Sulphur Subregion Study Area, there are three SFOs.

**Nonpoint Sources of Discharges in the TMDL Watersheds**: Nonpoint sources include those sources that cannot be identified as entering the waterbody at a specific location. Nonpoint sources of pollutants are typically separated into urban and rural categories. Surface storm runoff is an important source of loading in urban or residential settings with many roads and other paved, impervious areas. In rural settings, the sources of bacteria may include runoff of manure applied to agricultural land, the runoff of farm animal wastes associated with the erosion of sediments in grazing fields, contributions from wildlife, and failing septic tanks. Some examples include:

- **Wildlife** – Disease-causing bacteria can be produced by all warm-blooded animals, including birds. Wildlife is naturally attracted to riparian corridors of streams and rivers. With direct access to the stream channel, wildlife can be a concentrated source of bacterial loading to a waterbody. Bacteria from wildlife are also deposited onto land surfaces, where they may be washed into nearby streams by rainfall runoff. It must be noted that no data are available in Oklahoma to estimate wildlife populations other than deer. A number of bacteria source tracking studies around the nation demonstrate that wild birds and mammals can represent a major source of the fecal bacteria found in streams. Currently there are insufficient data available to estimate populations and spatial distribution of wildlife and avian species by watershed. Consequently, it is difficult to assess the magnitude of bacterial contributions from wildlife species as a general category.
  However, adequate data are available by county to estimate the number of deer by watershed. Using Oklahoma Department of Wildlife Conservation county data, the population of deer can be roughly estimated. By using this estimate and the percentage of the watershed area within each county, wild deer population can be calculated for each watershed. For the ten watersheds impaired for bacteria, this comes to about 8,559 deer. The average deer per acre rates ranged from 0.014 to 0.021. At this minimal concentration, wildlife is considered to be a minor contributor of bacteria in those impaired watersheds.
- **Farm Animals** - Agricultural livestock grazing in pastures deposit manure containing bacteria onto land surfaces. Detailed information is not currently available to describe or quantify the relationship between in-stream concentrations of bacteria and land application of manure from commercially raised farm animals. Despite the lack of specific data, land application of commercially raised farm animal manure is considered a potential source of bacterial loading into watersheds in the Red-Sulphur Subregion Study Area for the purpose of these TMDLs. 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 bacterial loading into waterbodies if washed

into streams by runoff. In Oklahoma, poultry waste applicators must be certified.

- **Livestock grazing in pastures:** Livestock deposit manure containing fecal bacteria onto land surfaces. These bacteria may be washed into waterbodies by storm runoff.
- **Direct access to waterbodies by livestock:** Livestock standing in or crossing streams can provide a direct concentrated source of fecal bacteria into the streams. In the ten bacterially-impaired watersheds, cattle (an estimated 61,697 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 2022 USDA county agricultural census data. The estimated farm animal populations were derived by using the percentage of the watershed within each county. Refer to the full TMDL report for the estimated number of all agricultural animals (**Table 3-4**) as well as their daily fecal coliform production rates (**Table 3-5**).

- **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 1.46 dogs and 1.78 cats [American Veterinary Medical Association (2022)]. On average 45% of the nation's households own dogs and 26% own cats. Based on these averages, it is estimated that there are about 5,211 dogs and 3,672 cats in the ten bacterially-impaired 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 405 failing septic systems in the ten bacterially-impaired watersheds. Refer to the full TMDL report (Section 3.3.4) on how these numbers were calculated.

## Summary of Possible Sources of Impairment:

- **Bacteria** - The health effects of bacteria should be a concern for the public who use these waterbodies for activities such as swimming, wading, or boating because some waterborne bacteria can cause serious human illness or disease. In the Red-Sulphur Subregion Study Area, most of the bacteria appear to come from nonpoint sources because the contribution from the continuous permitted point sources is not significant when it is compared to TMDL.
  Though most of the pathogens come from nonpoint sources, the specific sources from which the bacteria come cannot be determined without additional study. Of the four major nonpoint sources (wildlife, farm animals, failing septic systems, and domesticated dogs & cats), most of the fecal coliform load estimates from nonpoint sources to land surfaces appears to come from farm animals (**Table 3-15**).
  **Table 3-15** of the TMDL report is an estimated percentage of fecal coliform load estimates from the four major nonpoint source categories that can contribute to the elevated bacterial concentrations found in these watersheds. It is estimated that commercially raised farm animals contribute 99.0% to 99.7% of the fecal coliform load estimates to land surfaces in these ten TMDL watersheds.

## TMDL Calculations:

The purpose of a TMDL is to identify sources of pollutants in a watershed and calculate the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. This TMDL report contains waterbodies that are in violation of Oklahoma Water Quality Standards with respect to bacteria. The TMDL calculates the reduction (**Table 5-1**) in bacteria that would be needed in order for these streams to be in compliance with Oklahoma's WQS. This was done using load duration curves. The calculations include present and future sources as well as a margin of safety. For more information on how the TMDLs were developed, read Sections 4 & 5 and Appendix B of the TMDL report.

## Recommendations:

After re-evaluating bacterial data following Oklahoma's assessment protocol, eleven TMDLs were developed for the ten waterbodies in the Red-Sulphur Subregion Study Area. **Table 5-3** summarizes the calculations of the bacterial TMDLs in the report. **Table 5-1** indicates the amount that each pollutant will need to be reduced [Percent Reduction Goal (PRG)] for that waterbody to meet water quality standards and its designated beneficial uses.

## Providing comments

- DEQ invites your comments. The comment period will be open for 45 days. The TMDL report is a draft document and is subject to change based on comments received during the public participation process.
- You may also request a public meeting in writing. If there is a significant degree of interest, DEQ will schedule a public meeting.
- All official comments for the record must be submitted either in writing or by e-mail before the end of the comment period. DEQ will prepare a responsiveness summary addressing all comments received. After evaluating comments received and making any necessary changes, the TMDL report will be submitted to EPA for final approval. The final results of the TMDL will be incorporated into Oklahoma's Water Quality Management Plan.

**Please submit your comments in writing to:** Soojung Lim, Water Quality Division, Oklahoma Department of Environmental Quality, P.O. Box 1677, Oklahoma City, OK 73101-1677; (405) 702-8195; E-mail: Water.Comments@deq.ok.gov

**Comments must be received by 4:30 pm on Monday, July 7, 2025**

**Obtaining copies:** You may view the full Red-Sulphur Subregion Bacterial and Turbidity TMDL study by going to the DEQ website at: https://www.deq.ok.gov/water-quality-division/watershed-planning/tmdl/ or by picking up copies at the DEQ main office, Water Quality Division, 707 North Robinson, Oklahoma City from 8:30 am – 5:00 pm. A document copying fee may apply.

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If you would like to receive any or all of these public notices via e-mail, please send your e-mail address to Water.Comments@deq.ok.gov. Also, please let us know if you want to receive notices for the entire State or just for your watershed.

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