

TMDLs and 303(d) Types, Requirements, Triggers

GCSA Employee Training

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Congress & Sec. 303(d) of the CWA

- FEDERAL ACTION:

- 1972 Congress passed the Federal Water Pollution Control Act (the “Clean Water Act”).
- EPA was given responsibility over CWA.
- CWA Section 303(d) requires biennial report to Congress from each state on impaired waterbodies.

- STATE ACTION:

- 1997 Oklahoma granted “Primacy” by EPA to administer CWA requirements for stormwater under state General Permits.

Oklahoma Rules

- Oklahoma Department of Environmental Quality (ODEQ) operates under Oklahoma Statutes (“Rules”).
- EPA regulations are adopted “by reference” into State Statutes.
- Thus Federal regulations become State rules by automatic adoption (“by reference”).
- The Oklahoma Water Resources Board (OWRB) also operates under State rules tied to the CWA.
- The OWRB sets Water Quality Standards (WQS) and procedures. The ODEQ enforces the WQS.

Pollutants in Urban Stormwater

- Sediment
- Nutrients
- Oxygen-Demanding Substances
- Pathogens
- Trash
- Road Salts
- Oil and Grease
- Heavy Metals
- Heat
- Petroleum
- Pesticides
- Other organics



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303(d) Impairment

A stream or lake can be listed for any combination of parameters:

Dissolved oxygen, nutrients, chlorophyll

Toxics (metals, organics, pesticides, “unknown”)

Sediment, suspended solids, turbidity

Pathogens (bacteria)

Biological (fish, macroinvertebrates)

pH

Oil & grease

Chloride, sulfate, TDS



Types of Waterbodies in 303(d)

- **What 303(d) covers at present:**
 - *Streams, rivers, creeks.*
 - *Lakes (publically owned; e.g., Corps, municipal, authorities, etc.).*
- **What 303(d) does not cover yet:**
 - *Wetlands.*
 - *Private lakes and ponds.*
 - *Groundwater.*
 - *Waterbodies not considered “Waters of the State”.*

The Oklahoma 303(d) List

- 2014 is the most recent approved 303(d) List).
- Typical lag time of around 2 years (lengthy approvals).
- Science-based. Formal sampling required.
- OWRB prescribes 303(d) methods in their WQS.
- OWRB's Chapter 45 has the WQS; Chapter 46 has the 303(d) assessment procedures.
- ODEQ coordinates the assessments: manual process now, ODEQ & OWRB are trying to automate.
- 303(d) impairments apply to the WQS Beneficial Uses.

WQS Beneficial Uses

- Defined in OWRB's Chapter 45 rules.
- They relate to how each waterbody is used.
- Beneficial Use examples are: recreation, fisheries, aesthetics, agriculture, etc.
- Each waterbody listed in the WQS is assigned a specific set of Beneficial Uses; not all are the same.
- Waterbodies not listed in the WQS are assigned a default set of Beneficial Uses.
- WQS protect Beneficial Uses. One pollutant may have 2 or more WQS concentrations, depending on the use.

Oklahoma Integrated Report & 303d

- The CWA requires several types of reports to Congress.
- Oklahoma combined these into a single biennial report, the “Water Quality Integrated Report” (IR).
- 303(d) impairments are “Category 5” in the IR.
- Category 5 has 3 sub-categories:

***5a** – TMDL is underway or will be scheduled.*

***5b** – A review of the WQS will be conducted before a TMDL is scheduled.*

***5c** – Additional data and information will be collected before a TMDL or review of the WQS is scheduled.*

Category 4a on the 303(d) List

- 2014 is the first biennial cycle that includes Category 4a on the 303(d) List.
- Category 4a = a TMDL has been completed.
- In past 303(d) cycles, ODEQ considered, and EPA accepted, that once a TMDL had been completed, the waterbody could be taken off the 303(d) List.
- EPA now assumes that a waterbody can still be impaired even though the TMDL has been completed.
- The water quality data itself must show non-impairment. TMDL implementation takes time...

Waterbody ID System (WBID)

- Oklahoma uses its own Identification system (WBID).
- Each WBID follows this protocol: **OK101010101010_10**
- The first 6 numbers identify which watershed the waterbody is in. The second 6 numbers identify which stream or lake. The last 2 numbers refer to the segmentation of an original WBID.
- EPA and the US Geological Survey (USGS) have their own systems, but all permits in Oklahoma, and all WQS rules refer exclusively to the Oklahoma WBID system.
- Finding the WBID for a waterbody can be difficult.

Category 5: the “TMDL List”

- Most 303(d) waterbodies, if they remain on the 303(d) List, will require a TMDL.
- The time between initial listing to TMDL completion can take 1-10 years, most being a few years.
- Changing trends in TMDL pollutants:
 - *Originally were for stream dissolved oxygen.*
 - *Now bacteria, specific metals, dissolved solids (salts), turbidity / suspended solids.*
 - *Future TMDLs will be for nutrients and Fish / M.I.*

What is a TMDL ?

“Total Maximum Daily Load”

Calculates the maximum allowable pollutant loading for a waterbody that will still protect WQS.

All point source loads (**WLAs**) + all nonpoint source loads (**LA**s) + a margin of safety (**MOS**).

Special WLA just for stormwater permittees: “**WLA_MS4**”

$$\text{TMDL} = \Sigma \text{WLA} + \Sigma \text{LA} + \text{Background} + \text{MOS}$$

Calculating TMDL Units

- TMDLs are required by the CWA.
- Courts have upheld that a TMDL must be about a “**load**” (not a concentration) and “**daily**” (not annual load or other time factor).
- **Daily Load** is a pollutant mass per day (e.g., lbs/day).
- **Concentration** is a mass per volume (e.g., mg/L).
- Lab data are typically in concentration units.
- **Lbs/day = Conc. (mg/L) x Flow (mgd) x 8.34.**

How Many TMDLs Per Stream?

- A single stream may be divided into 2 or more WBID segments, each with its own unique WBID.
- Each WBID segment is treated as a separate waterbody for 303(d) listings and TMDL studies.
- A single WBID segment can have 2 or more 303(d) impairments (e.g., E. coli, turbidity, TDS, etc.).
- Each 303(d) impairment parameter will require a separate TMDL study.
- Thus, a 3-segment stream, with each segment having 2 303(d) parameters, will have 6 TMDLs performed.

Sequence of TMDLs Per Stream

- A single stream having 2-3 WBID segments, each with more than one 303(d) listing, will not likely have all of the various TMDLs done at one time.
- The ODEQ goal is to do as many TMDLs within the same watershed as possible. But some 303(d) parameters do not yet have TMDL procedures, so those TMDLs must wait, perhaps for years.
- Some examples of yet-to-be-developed TMDL procedures are for: stream DO with no WWTPs; metals; and impairments of biological communities.

History and Numbers of TMDLs

- **1990s:** most TMDLs were for stream D.O. and had no true nonpoint source “Load Allocations” (LAs) or background calculations. They were mostly WLAs.
- **2000s:** ODEQ began intensive development of hundreds of bacteria TMDLs across Oklahoma.
- **2010s:** now expanded to turbidity, dissolved solids, some nutrients, and soon metals.
- TMDLs address all of the watershed.
- All MS4s within a TMDL watershed have to comply with the TMDL requirements.

Multiple TMDLs in a Single Report

Cover page to a 2015 TMDL Report (261 p.) + Appendices (274 p.)

2015 BACTERIAL AND TURBIDITY TOTAL MAXIMUM DAILY LOADS FOR OKLAHOMA STREAMS IN THE ARKANSAS AND NEOSHO RIVER AREAS

(OK120420, OK121700, OK121300, OK121400, OK121500, OK121600 AND OK121610,
OK220100, OK220200, OK621000, OK621100, OK621200)

Oklahoma Waterbody Identification Numbers

Arkansas River Watershed

OK120420010010_00	OK120420010060_00	OK120420010070_00	OK120420010090_00
OK120420010130_00	OK120420010140_00	OK120420010170_00	OK120420020040_00
OK121700030010_00	OK121700030080_00	OK121700030350_00	OK121700030370_00
OK121700040010_00	OK121700050010_00	OK121700050090_00	OK121700050120_00
OK121700050170_10	OK121700060010_00	OK121700060040_00	OK121700060080_00
OK220100020010_10	OK220200010010_00	OK220200030010_10	OK621000020040_00
	OK621010010130_00	OK621100000010_20	

Neosho River Watershed

OK121300010150_00	OK121400030170_00	OK121400040010_00	OK121500030010_00
	OK121600010290_00	OK121600070010_00	

Permit Obligations for TMDLs

- **WHO MUST COMPLY:**

- *OKR04-permitted MS4s.*
- *OKR05 and OKR10 permittees, as applicable.*
- *NPDES and OPDES-permitted dischargers.*
- *CAFOs (concentrated animal feeding operations).*

- **NO PERMITS; VOLUNTARY APPROACH:**

- *Unpermitted MS4s (those with no OKR04 permit).*
- *Non-CAFO agricultural activities.*
- *Businesses and landowners with no NPDES/OPDES permits.*

MS4 Requirements in TMDLs

- Because the OKR04 permit is a “point source discharge” permit, all stormwater flows from MS4s are considered point source “wasteload allocations” (**WLAs**) in a TMDL.
- Only OKR04 permitted MS4s have permit requirements to comply with a TMDL.
- OKR04 permittees have a separate WLA calculation, the “**WLA_MS4**”.



$$\text{TMDL} = \Sigma \text{WLA} + \Sigma \text{WLA_MS4} + \Sigma \text{LA} + \text{Background} + \text{MOS}$$

Turbidity TMDLs do not have Stormwater Permit requirements.

Types of TMDLs With MS4s

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TERMS

- **“Notification TMDLs” (“Old TMDLs”):**
 - *Those completed prior to November 2013.*
 - *ODEQ must notify each MS4 of requirements.*
 - *No notifications sent yet by ODEQ; expected soon.*
- **“EPA Approved TMDLs” (“New TMDLs”):**
 - *Those completed after 2013.*
 - *Must begin compliance upon EPA approval of the TMDL.*
 - *Only 1 “new” TMDL approved by EPA so far; expect many more soon.*

Types of TMDL WLA_MS4s

- **Aggregate WLA_MS4s:**

- *The TMDL calculates a single combined WLA_MS4 load for all permitted MS4s in the TMDL watershed.*
- *No individual WLA_MS4 calculated for each MS4.*
- *Most Notification TMDLs are done this way.*

- **Individual WLA_MS4s:**

- *All new TMDLs (2014 on) have a separate WLA_MS4 calculation for each MS4.*
- *The new OKR04 requires this load to be set as a TMDL Measurable Goal in the SWMP.*

“Old TMDL” Stormwater Appendix

“Compliance with the following provisions will constitute compliance with the requirements of this TMDL.”

- 1. Develop a Pollutant Reduction Plan (w/in 12 months).*
- 2. Develop or participate in a Pollutant Monitoring Program (w/in 18 months; fully implemented w/in 3 years).*
- 3. Annual TMDL Implementation Report in the OKR04 Annual Report.*

“New TMDL” Stormwater Appendix

“This TMDL adopts the EPA recommended approach and relies on appropriate BMPs for implementation. No numeric effluent limitations are required or anticipated for stormwater discharge permits.”

- 1. Develop a TMDL Compliance Plan (w/in 24 months; has very detailed requirements).*
- 2. Develop or participate in a Pollutant Monitoring and Tracking Program (w/in 24 months; fully implemented w/in 3 years ; has very detailed requirements).*
- 3. Annual TMDL Implementation Report in the OKR04 Annual Report.*

Inspections for 303(d) in OKR04

III. A Compliance with Water Quality Standards

1. If you discharge to waters identified on the latest CWA § **303(d)** list of impaired waters, you must...
 - c. You must identify any non-stormwater discharges that contribute significant pollutants to your impaired waters.
 - d. You must locate those areas likely to have illicit discharges and conduct inspections based on the priority areas in the watershed of your 303(d) listed waterbodies.

Monitoring In Notification TMDLs

“The plan or program shall include:”

- (1) A detailed **description** of the goals, monitoring, and sampling and analytical methods;
- (2) A **list and map** of the selected TMDL monitoring sites;
- (3) The **frequency of data collection** to occur at each station or site;
- (4) The **parameters** to be measured, as appropriate for and relevant to the TMDL;
- (5) A [**QAPP**] that complies with EPA requirements [EPA Requirements for QA Project Plans (QA/R-5)].

Monitoring In EPA Approval TMDLs

“The plan or program shall include:”

- a. **Evaluation** of any existing stormwater monitoring program in relation to TMDL reduction goals. *(new)*
- b. A detailed **description** of the goals, monitoring, and sampling and analytical methods.
- c. A **map** that identifies discharge points, stormwater drainage areas contributing to discharge points, and within each such drainage area, mapping the conveyance system. *(new)*
- d. A **list and map** of the selected TMDL monitoring sites, which may include sites on receiving water bodies.

Monitoring In EPA Approval TMDLs

- e. **Consideration of methods** for evaluating pollutant loading in stormwater discharges from construction and industrial sites, such as monitoring requirements for site operators or small drainage monitoring for multiple construction sites. *(new)*
- f. The **frequency of sample collection** to occur at each station or site: at a minimum, sample collection shall include at least one representative sample of a stormwater discharge from at least 50% of the major discharge points discharging directly to surface waters of the state within the portion of the TMDL watershed in the MS4 area. A major discharge point is a pipe or open conveyance measuring 36 inches or more at its widest cross section. *(much more detailed)*

Monitoring In EPA Approval TMDLs

- g. The **parameters** to be measured, as appropriate for and relevant to the TMDL: at a minimum, the sample shall be analyzed for **total phosphorus (TP)**, **total nitrogen (TN)**, **total suspended solids(TSS)**, and **CBOD20**. *(INCOG NOTE: These parameters are for the Lake Thunderbird TMDL; there will be a different parameter list for each new TMDL.)*
- h. A **Quality Assurance Project Plan** [QAPP] that complies with EPA requirements [EPA Requirements for QA Project Plans (QA/R-5)].

When Must TMDL Compliance Begin

- **Notification TMDLs:**

- *ODEQ has not sent out any notifications so far.*
- *They have a draft notification under internal review.*
- *Best guess, notifications will begin in 2016.*
- *May go to larger MS4s first as test cases.*

- **EPA-Approval TMDLs:**

- *Only the Nov. 2013 L. Thunderbird TMDL is approved.*
- *No 2014 or later TMDLs have been approved by EPA.*
- *Unsure of delay; probably expect approvals in 2016.*

Thank you.

Any Questions ?



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