

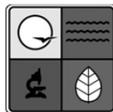
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## Blue River-Indian Creek Total Maximum Daily Load

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Bill Whipps and John Hoke



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## What is a TMDL?

The Maximum Amount of a Pollutant  
(the “Load”) That a Water Body Can  
Assimilate and Still Meet State Water  
Quality Standards

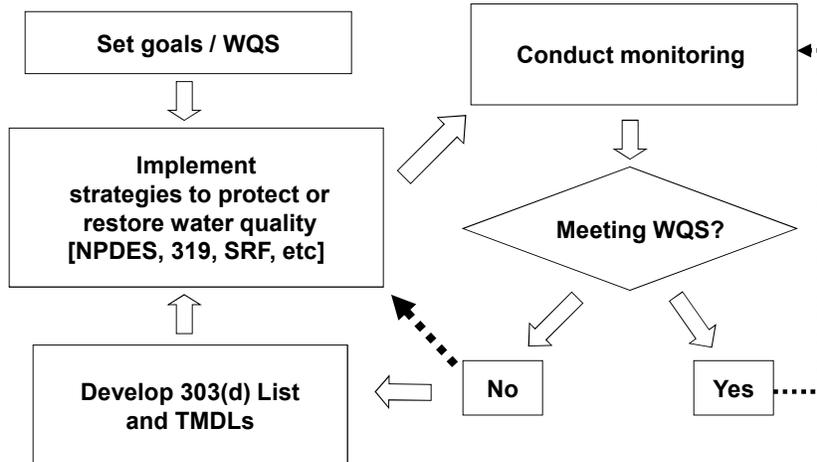
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FWPC Sec. 303(d)(1)(C)

"(C) Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, the **total maximum daily load**, for those pollutants which the Administrator identifies...as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.

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**TMDLs: Water Quality Based Process**



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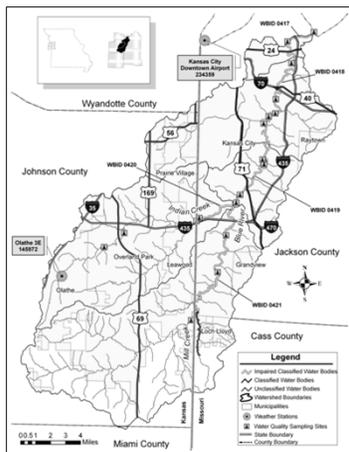
## TMDL Development Elements

- Identify All Potential Sources of Pollutant
- Calculate Maximum Pollutant Load
- Assign Daily Pollutant Allocations to Point Sources and Nonpoint Sources
- Include a “Margin of Safety” to Account for Uncertainty
- Address Seasonality

$$\cdot \text{TMDL} = \sum \text{WLA} + \sum \text{LA} + \text{MOS}$$

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## Blue River and Indian Creek



### Blue River

- 4 segments totaling 33.5 miles in Missouri
- 275 square mile watershed
- 2006 303(d) List

### Indian Creek

- 1 segment, 3.4 miles in Missouri
- 75 square mile watershed
- Tributary to Blue River
- 2002 303(d) List

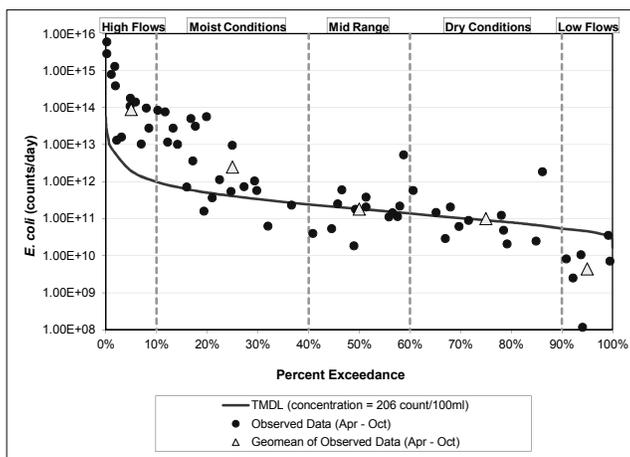
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## Bacteria TMDLs

|   |  |
|---|--|
| <u>Pollutant / Condition</u><br>Bacteria<br>Recreation Use Impairment   | <u>Source(s)</u><br>Point + Nonpoint Sources                                       |
| <u>Water Quality Criteria</u><br>126 col/100 mL ( <i>E. coli</i> ) WBC-A<br>206 col/100 mL ( <i>E. coli</i> ) WBC-B | <u>Margin of Safety</u><br>Explicit 10 % of<br>Loading Capacity                    |
| <u>Target Concentration</u><br>NPS+PS+MOS = col/100 mL  | <u>TMDL (Loading Capacity)</u><br>Criteria * Flow * Conversion =<br>counts per day |

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## Load Duration Curve



## Potential Sources Identified in the Blue River-Indian Creek Bacteria TMDLs

- Point Sources
  - Combined Sewer System (overflows)
  - Sanitary Sewer System (overflows)
  - Municipal Separate Storm Sewer System
  - Illicit Straight Pipe Discharges

## Potential Sources Identified in the Blue River-Indian Creek Bacteria TMDLs

- Nonpoint Sources
  - Agricultural Runoff
  - Onsite Wastewater Treatment Systems

## TMDL Implementation

Once Approved by EPA, Department Staff Follow the Progress of TMDL Implementation.

- Missouri State Operating Permit Modifications
- Best Management Practices (BMP)
- Watershed Group Organization and Support
- Follow-up Water Quality Monitoring
- TMDL Implementation Plan

TMDLs are a Phased and Iterative Process

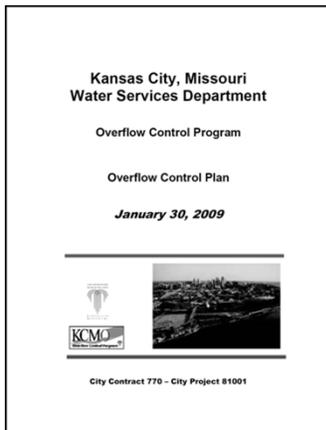
## TMDL Implementation Plan

- Level of Detail For Each Plan Will Vary Dependent Upon the Amount of Information Available.
- Plan Will Include EPA's 9-Elements for a Successful Watershed Plan Where Appropriate.
- Plan Will Identify Targeted Participants and Specify Their Potential Roles for Implementation.
- To the Extent Possible, the Plan Will Outline a Schedule for Meeting Benchmarks Towards Progress in Achieving Water Quality Standards.
- Identification of Critical Areas

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### Consent Decree and Control Plan



- Long-term plan – 25+ years
- Reduce or eliminate CSOs
- Adaptive watershed management
- Green infrastructure
- Stormwater BMPs
- Middle Blue River Basin Green Infrastructure Pilot Project
- Blue River Watershed Management Plan

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### MS4 Permits & TMDLs

Progress Toward Meeting Water Quality Standards Will Be Long-Term.

- Continue Implementing Current, Ongoing Activities.
- Continue Identifying Sources
- Begin Prioritizing Actions
- Eliminate Known Sources.

## Ultimate Goal is to Meet Water Quality Standards

- Once Developed, a TMDL Never Goes Away
- Permits May be Modified After the Water Body is No Longer Impaired.
- TMDLs May be “Re-Opened” and Modified Should Water Quality Standards Change

## Approved TMDLs

Online At

[dnr.mo.gov/env/wpp/tmdl/wpc-tmdl-EPA-Appr.htm](http://dnr.mo.gov/env/wpp/tmdl/wpc-tmdl-EPA-Appr.htm)

## Scheduled TMDLs

Online At

[dnr.mo.gov/env/wpp/tmdl/wpc-tmdl-progress.htm](http://dnr.mo.gov/env/wpp/tmdl/wpc-tmdl-progress.htm)

## Questions?



Blue River at Minor Park

Indian Creek near 103<sup>rd</sup> Street bridge



Photos courtesy of Stream Team Volunteer Water Quality Monitoring Program