A Statewide Approach to a Statewide Problem

DEQ

E. coli in surface water and TMDLs

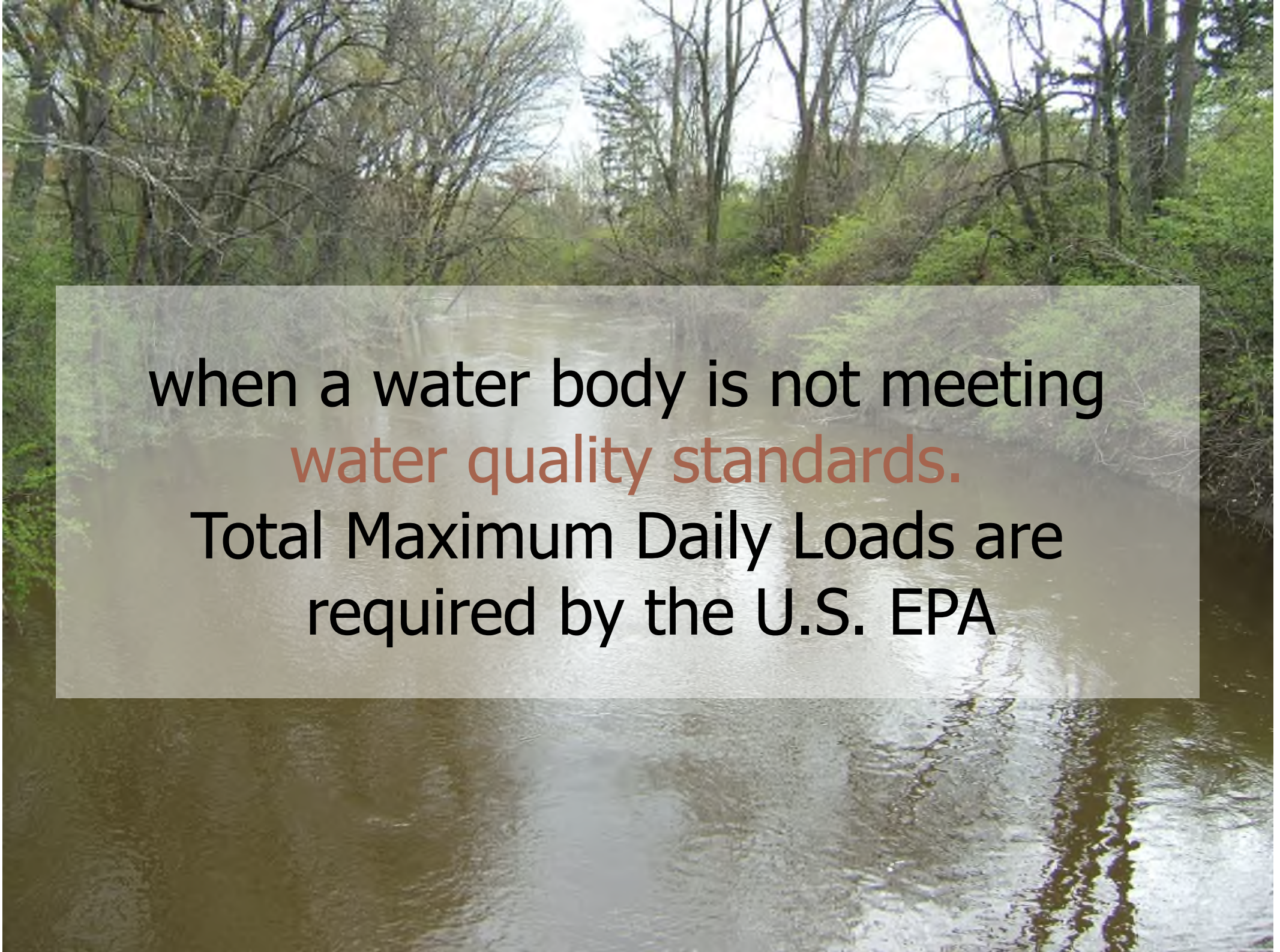
Presentation Overview

- Information on *E. coli and water quality standards*
- What is a Total Maximum Daily Load?
- Statewide approach
- All Potential Sources
- TMDL contents
- TMDL Update Process
- Two examples of sources, and their Reasonable Assurance
- Next steps

Clean Water Act
Water Quality Standards
Assessment
303(d) List
TMDL

Michigan Water Quality Standards for *E. coli*

- Designed to protect human health during RECREATION
- Partial body contact – year-round
  - 1000 *E.coli* per 100mL
- Total body contact – May 1-October 31
  - 300 *E.coli* per 100mL as a daily max.
  - 130 *E.coli* per 100mL as a 30-day geometric mean



when a water body is not meeting water quality standards.

Total Maximum Daily Loads are required by the U.S. EPA

WLA

Point Sources of *E. coli* (NPDES)

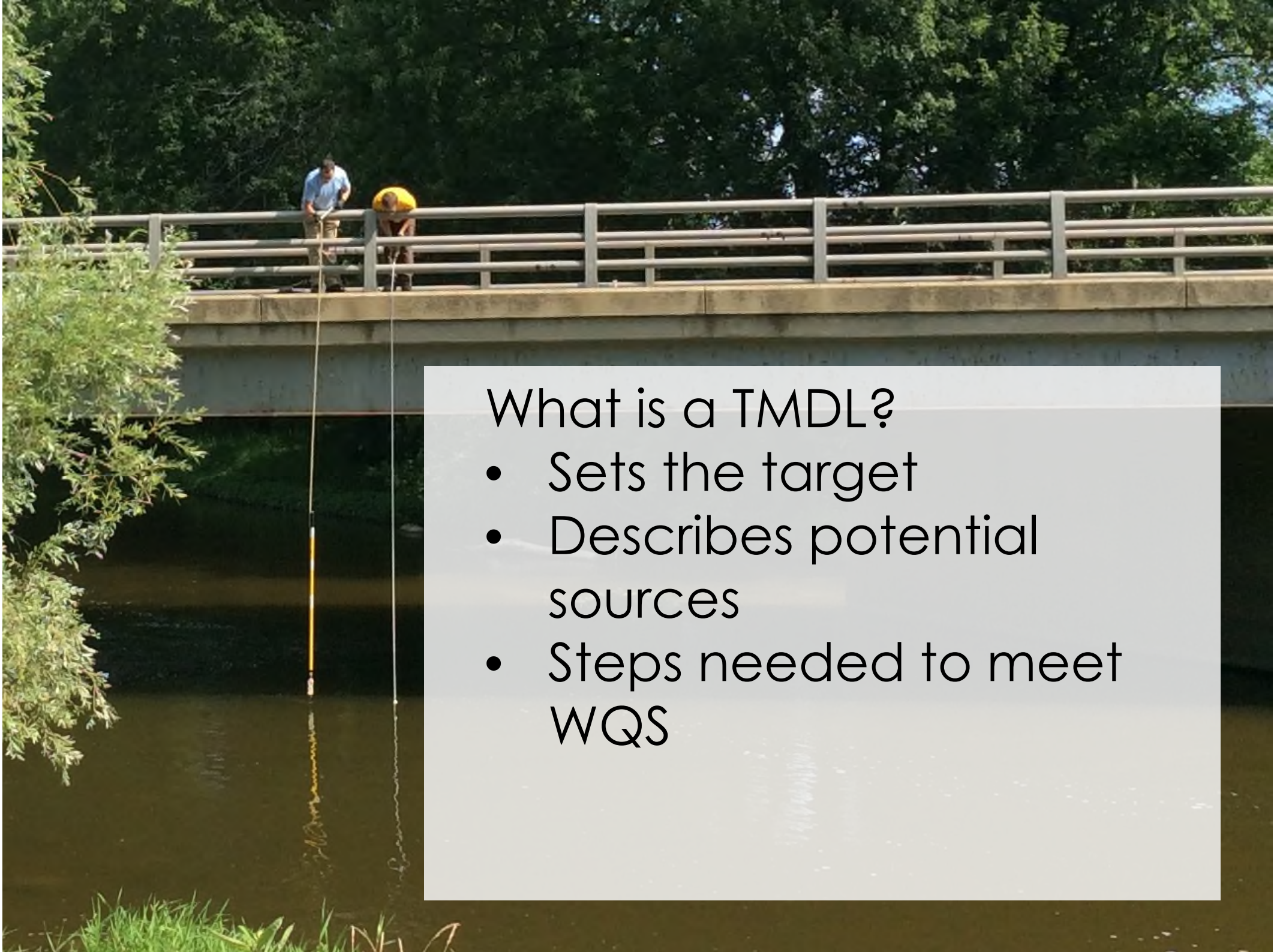
+

LA

Nonpoint Sources of *E. coli*

→

TMDL

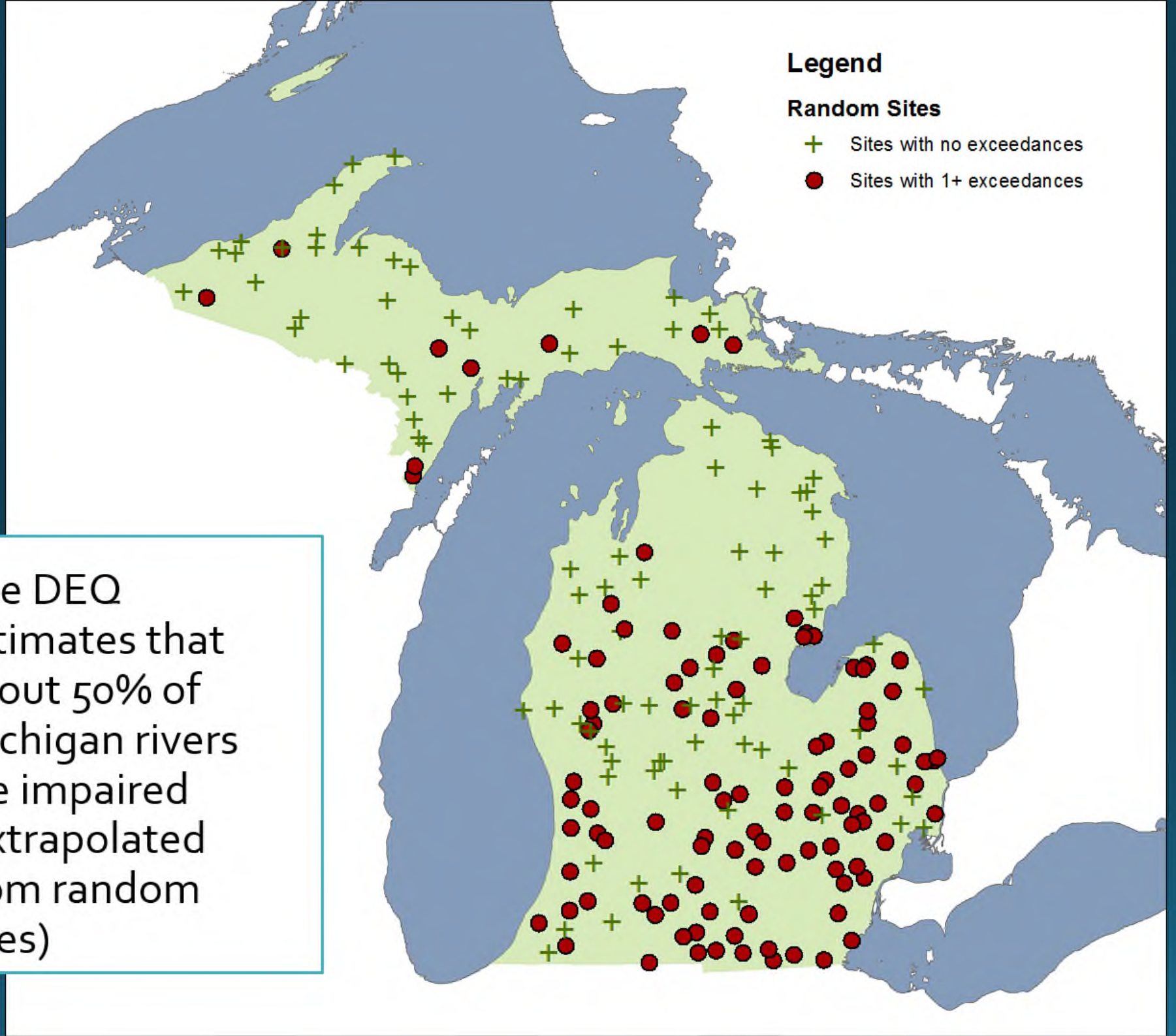


What is a TMDL?

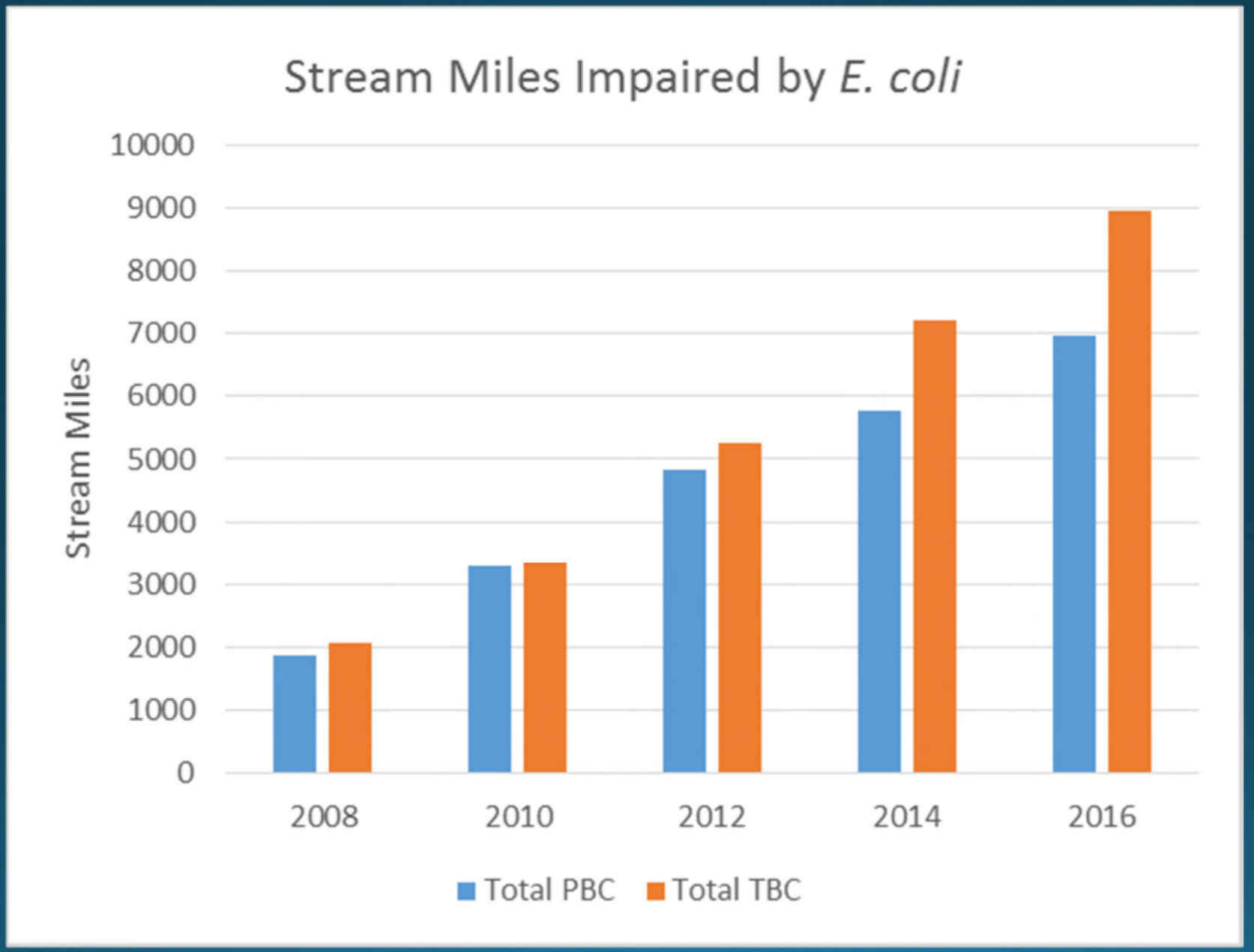
- Sets the target
- Describes potential sources
- Steps needed to meet WQS

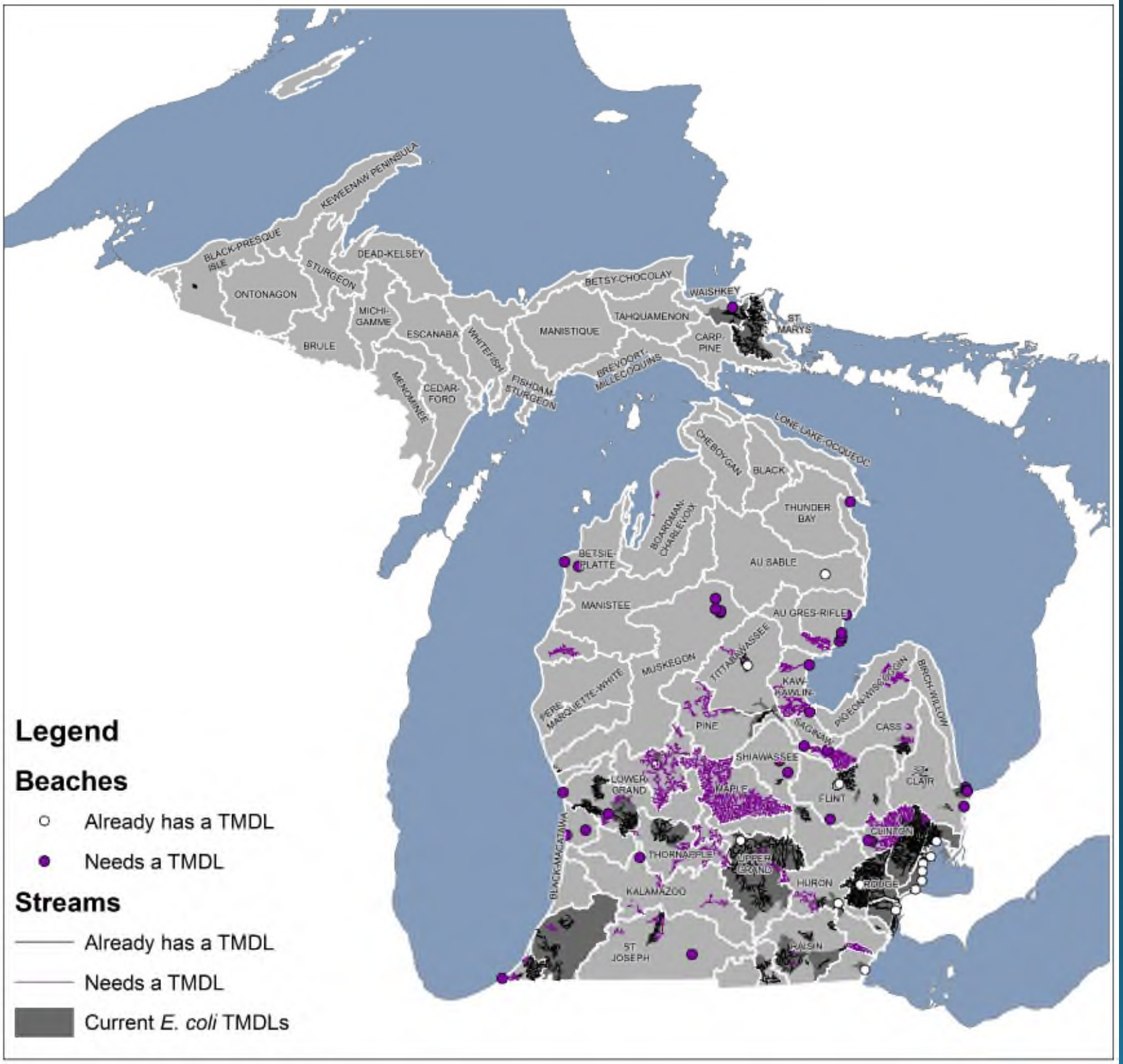
Problem Statement-

Just how widespread is this issue?



The DEQ estimates that about 50% of Michigan rivers are impaired (extrapolated from random sites)


Stream Miles Impaired by *E. coli*
Stream Miles
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
2008
2010
2012
2014
2016
Total PBC
Total TBC


KEWEENAW PENINSULA
BLACK-PRESQUE ISLE
DEAD-KELSEY
STURGEON
ONTONAGON
MICHI-GAMME
BRULE
ESCANABA
WHITEFISH
MENOMINEE
CEDAR-FORD
FISHDAM-STURGEON
MANISTIQUE
BETSY-CHOCOLAY
TAHQUAMENON
WAISHKEY
ST MARYS
CARP-PINE
BREVOORT-MILLECOQUINS
LONE LAKE-OCQUEOC
CHEBOYGAN
BLACK
THUNDER BAY
BOARDMAN-CHARLEVOIX
BETSIE-PLATTE
AU SABLE
MANISTEE
AU GRES-RIFLE
TITTABAWASSEE
MUSKEGON
PERE MARQUETTE-WHITE
KAW-KAWLIN
PIGEON-WISSINGON
BIRCH-WILLOW
PINE
SAGINAW
CASS
SHIAWASSEE
LOWER GRAND
MAPLE
FLINT
ST CLAIR
CLINTON
THORNAPPLE
UPPER GRAND
HURON
ROUGE
KALAMAZOO
BLACK-MACATAWA
ST JOSEPH
RAISIN
Legend
Beaches
Already has a TMDL
Needs a TMDL
Streams
Already has a TMDL
Needs a TMDL
Current E. coli TMDLs

Once upon a time….

- TMDLs were watershed based
- Only had the resources for one or two per year

The list for TMDL development was estimated to require at least 17 years to complete.

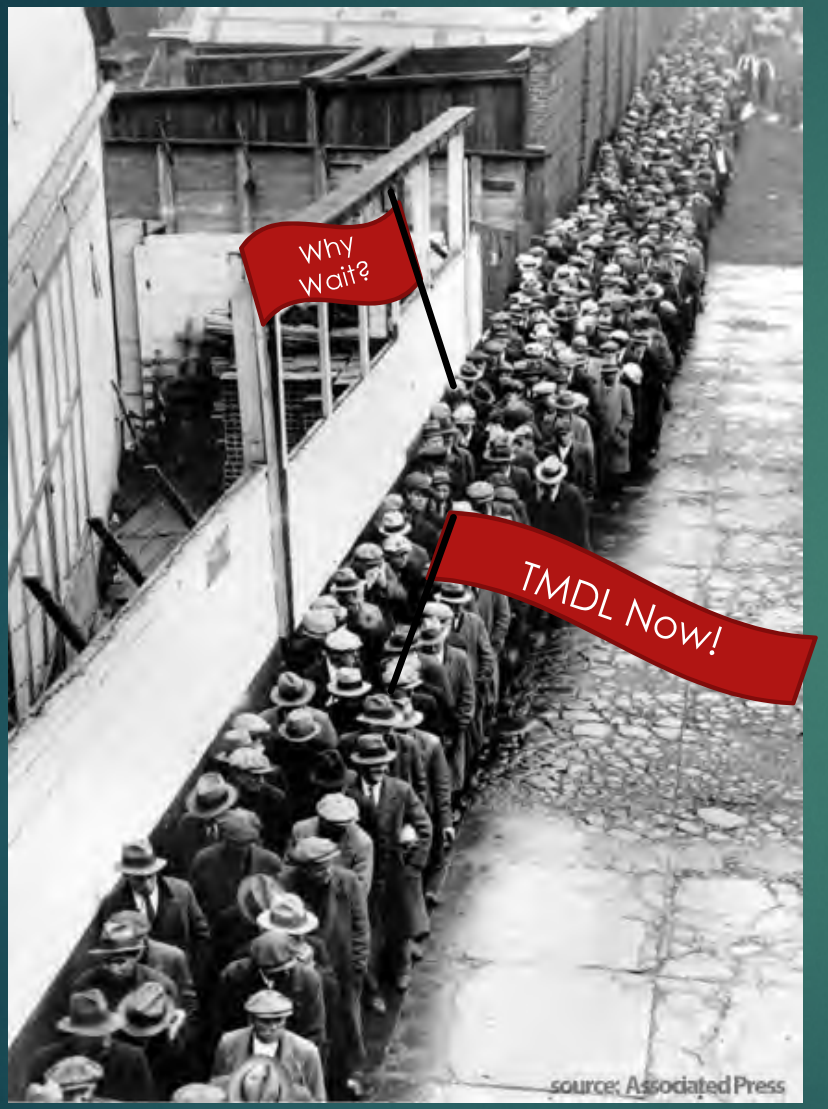
TMDL must be approved by EPA before actions to reduce the pollutant go into a permit.

New Alternative Approach:

The MDEQ will address exceedances of the *E. coli* WQS with a "statewide" TMDL.

New Alternative Approach:

This is part of our new "TMDL Vision", laying out our priorities for the next 6 years.



BENEFITS OF A STATEWIDE APPROACH:

- IMPLEMENT NEEDED POLLUTANT REDUCTIONS THROUGH NPDES PERMITS SIGNIFICANTLY FASTER
- NO MORE WAITING FOR 17 YEARS!

BENEFITS OF A STATEWIDE APPROACH

- REDUCE REDUNDANCY
- FREE-UP PUBLIC RESOURCES TO:
  - Focus on *E. coli* monitoring in priority areas
  - Offer more assistance in post-TMDL monitoring

Potential Sources

What are the sources of *E. coli*?

- Point sources – regulated by NPDES permit
- Nonpoint sources- not regulated by NPDES permit

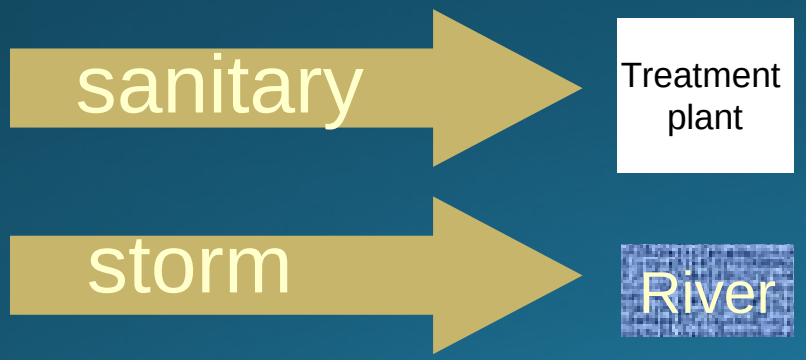
Point Sources of *E. coli*

- Treated Sanitary Wastewater (Human Sewage)
  - WWTPs/WWSLs
  - Disinfected

Point Sources:

- CSOs and SSOs: overflows of untreated or partially treated sewage
  - Combined Sewer Overflows (CSOs)

  - Sanitary Sewer Overflow (SSO) are generally illegal "spills"



Point Sources

- Regulated storm water
  - Industrial
  - Municipal Separate Storm Sewer Systems (MS4)

Point Sources

- Concentrated Animal Feeding Operations (CAFOs)
  - Large livestock operations that meet size criteria are regulated in NPDES program

Biosolids

- Residuals that settle out of sewage during treatment at a facility
  - WWTPs and WWSLs
- Can be land applied after being treated to reduce pathogens

Non-Point Sources

- Do not hold NPDES permits
- DEQ lacks the authority to regulate many types of non-point sources (except illegal ones)
- Other agencies may regulate some nonpoint sources

Nonpoint Sources

- Unregulated storm water (sewers and run-off)

Nonpoint Sources

Animal agriculture

- Land application of manure should stay on LAND

Nonpoint Sources

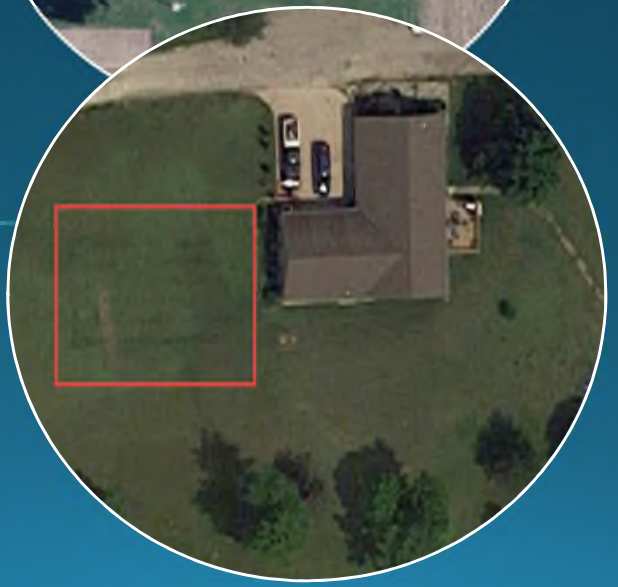
Animal agriculture

- Livestock and pasture runoff

Nonpoint Sources

Poor location (soils, lot size, etc)

Old systems



Maintenance issues

Failing Septics

Nonpoint Sources

- Septage (solids from septic tanks)

Nonpoint Sources

- Pets & wildlife

Nonpoint Sources

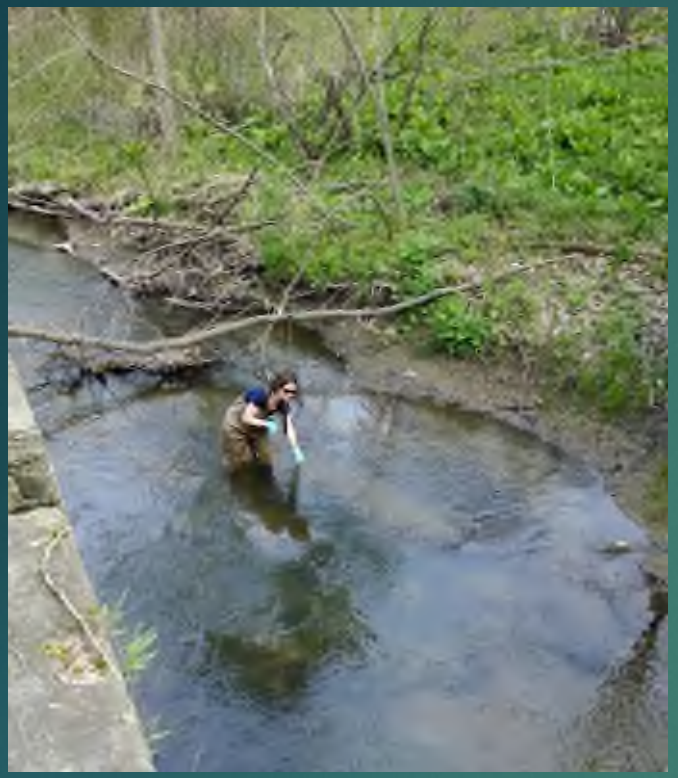
- Illicit connections
- Report to the MDEQ because it is DANGEROUS

What do you think?

Poll Question

The Statewide TMDL will provide a general legal framework for reducing pollutant loads

Will only apply in impaired areas that are identified in the USEPA approved 303d List!!!

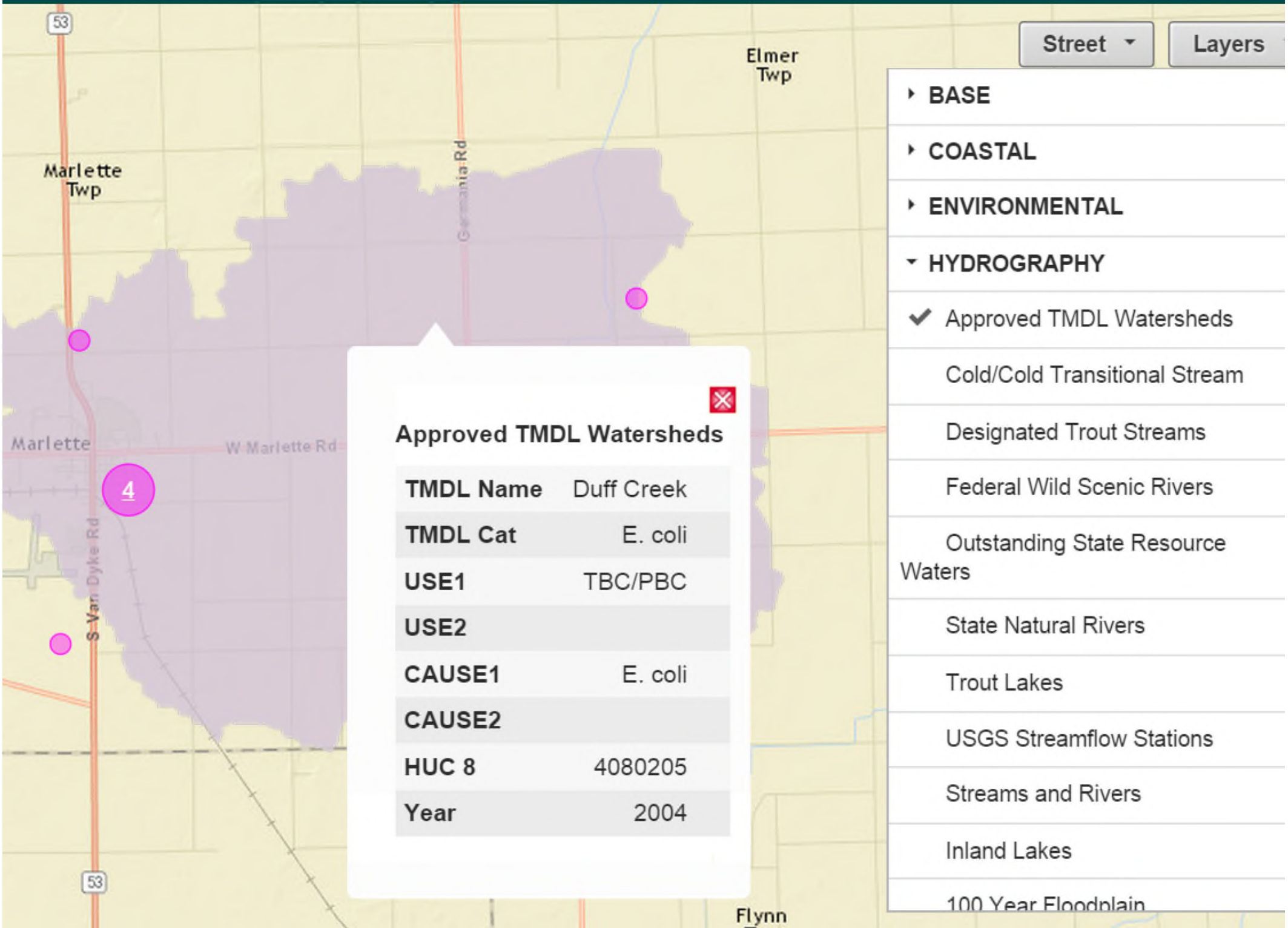


Update Process

ADDING NEW IMPAIRED WATERS AND NPDES FACILITIES

"I have a bad feeling
About this" Creek
DARTH R.
Cantina Cr
Chewy Channel
Jedi Lake
Rebel R
The Dune Sea
BANTHA BAY
Cloud City Beach
Alderan Cr
Toshi R
Yavin Cr
Hoth R
Bantha Cr
HanSolo Dr.
OB1 R
Leia Cr.
Rancor R
Ray Beach
Luke Cr
Chewy Channel
Lando Lake
Jabba R
Sarlac Sea

- PERMITTEES WILL BE NOTIFIED OF PROPOSED INCLUSION IN TMDL ADDENDUM VIA MIWATERS EMAIL CONTACT INFORMATION


Street
Layers
BASE
COASTAL
ENVIRONMENTAL
HYDROGRAPHY
Approved TMDL Watersheds
Cold/Cold Transitional Stream
Designated Trout Streams
Federal Wild Scenic Rivers
Outstanding State Resource Waters
State Natural Rivers
Trout Lakes
USGS Streamflow Stations
Streams and Rivers
Inland Lakes
100 Year Floodplain
Elmer Twp
Marlette Twp
Marlette
W Marlette Rd
S Van Dyke Rd
Flynn
53
4
Approved TMDL Watersheds
TMDL Name Duff Creek
TMDL Cat E. coli
USE1 TBC/PBC
USE2
CAUSE1 E. coli
CAUSE2
HUC 8 4080205
Year 2004

Timing for NPDES permittees:

TMDL update is public noticed with Integrated Report

TMDL update approved by EPA with Integrated Report

If the TMDL is approved At the normally scheduled time for permit reissuance, THEN

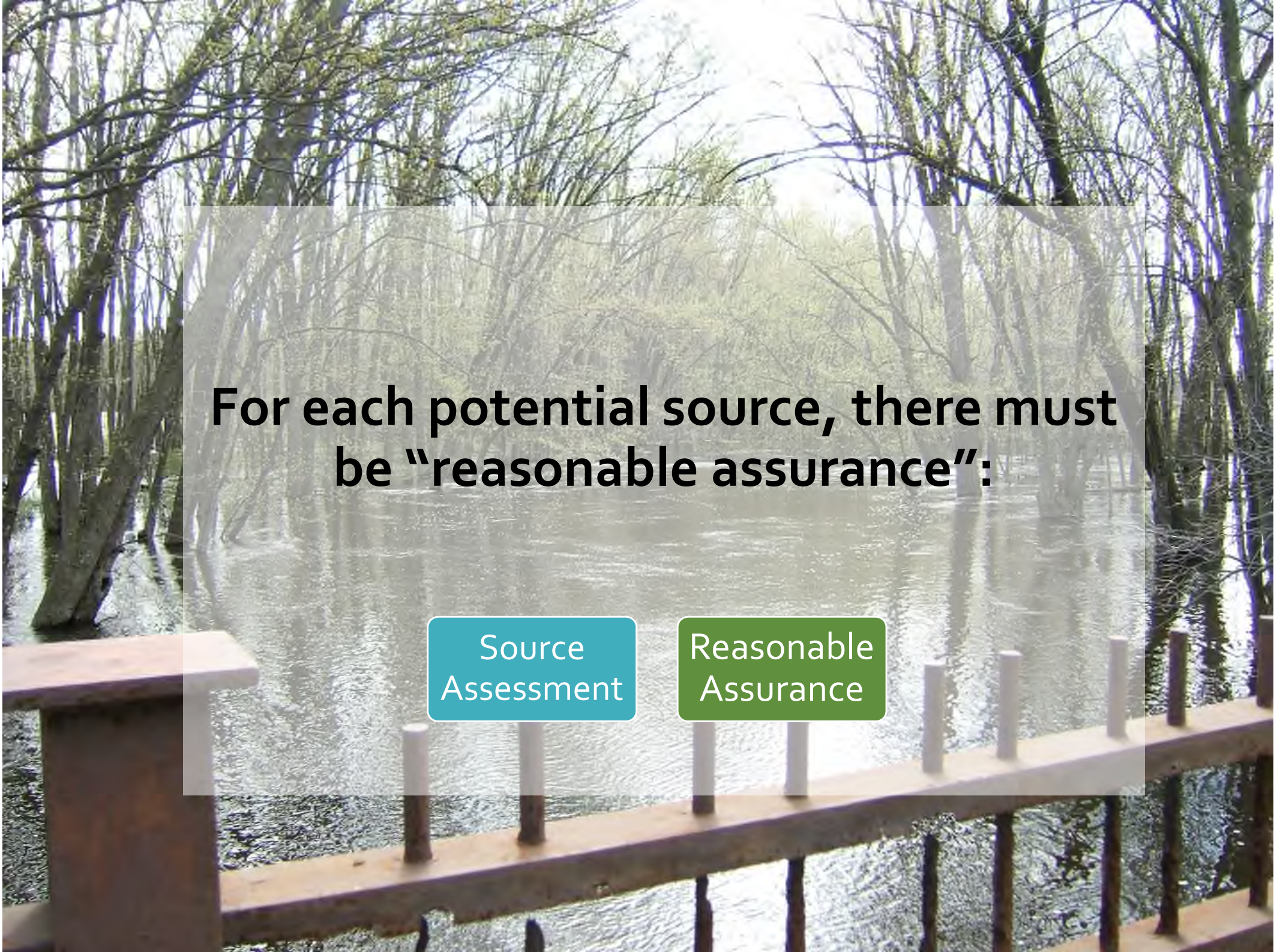
TMDL incorporated into permit at reissuance

TMDL Contents

- GENERAL INFO ON THE TARGET (WQS)
- LIST OF WATERS INCLUDED IN THE TMDL AND PERCENT REDUCTIONS NEEDED FOR EACH
- SOURCE ASSESSMENT
- REASONABLE ASSURANCE

TMDL Contents

- ONLINE INTERACTIVE MAPPING SYSTEM
- RESULTS OF A STATISTICAL ANALYSIS OF 205 WATERSHEDS IN MICHIGAN
- PLANNING FOR CLIMATE CHANGE AND GROWTH
- SUCCESS STORIES AND IMPLEMENTATION GUIDANCE
- DOCUMENTATION OF HOW WE WILL PRIORITIZE OUR FUTURE MONITORING AND IMPLEMENTATION ACTIVITIES



For each potential source, there must be "reasonable assurance":

Source Assessment

Reasonable Assurance

Source Assessment

- Describe each source type spatially across the state
- Describe conditions which lead to problems (proper vs. improper practices)

Reasonable Assurance

- Describe all regulations and voluntary programs that may help fix the problem
- May include special NPDES permit requirements to control the pollutant

Example source assessment and reasonable assurance

INDUSTRIAL STORM WATER AND FAILING SEPTIC SYSTEMS

Source Assessment

Example of a Point Source: Industrial Storm Water

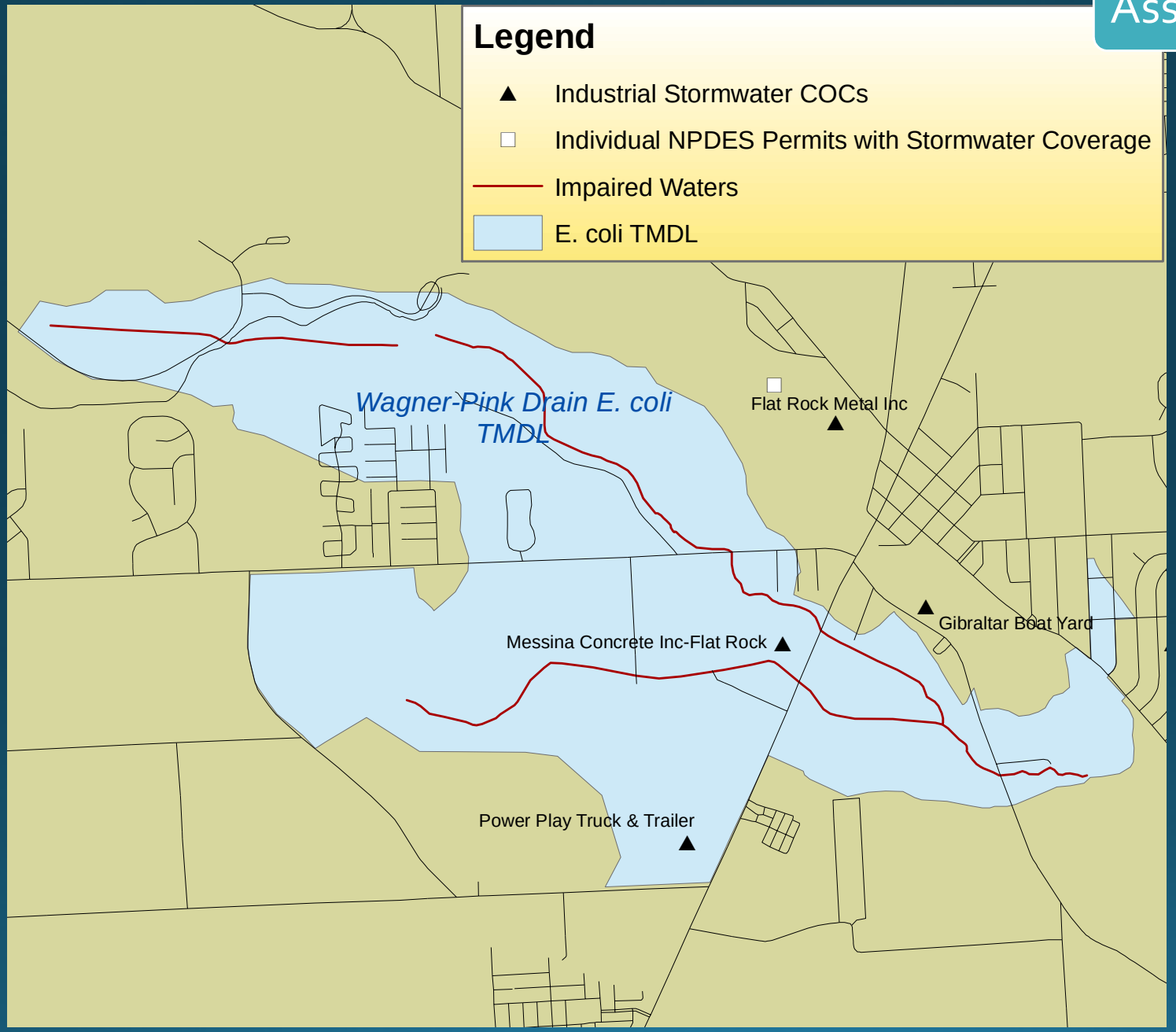
Source Assessment

Not generally a major source of *E. coli*, but.....

Source Assessment

$#IT happens!

Source Assessment



Example of a Point Source: Industrial Storm Water

Reasonable Assurance

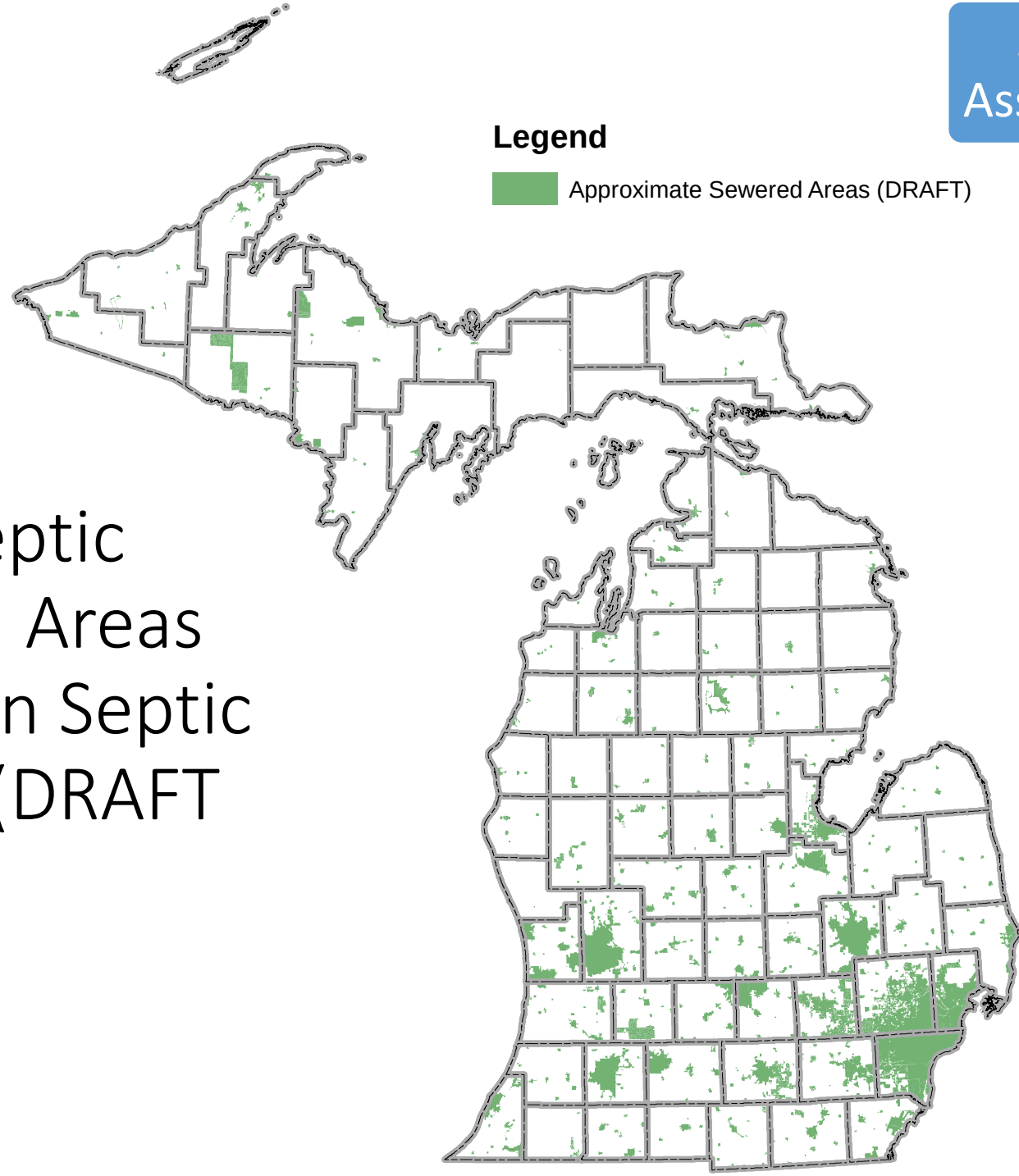
- All industrial storm water permits already prohibit the discharge of *E. coli* in amounts that would exceed the standard.
- When TMDL is approved by the EPA, and when permit is up for regular reissuance
  - Certificate of Coverage will identify the TMDLs that apply
  - In addition, a storm water permittee in an *E. coli* TMDL will need to address this pollutant and TMDL in their Storm Water Pollution Prevention Plan (SWPPP)
  - SWPPP must be implemented

Source Assessment

Example of a Nonpoint Source: Failing Septic Systems

Source Assessment

Failing Septic Systems: Areas Relying on Septic Systems (DRAFT MAP)

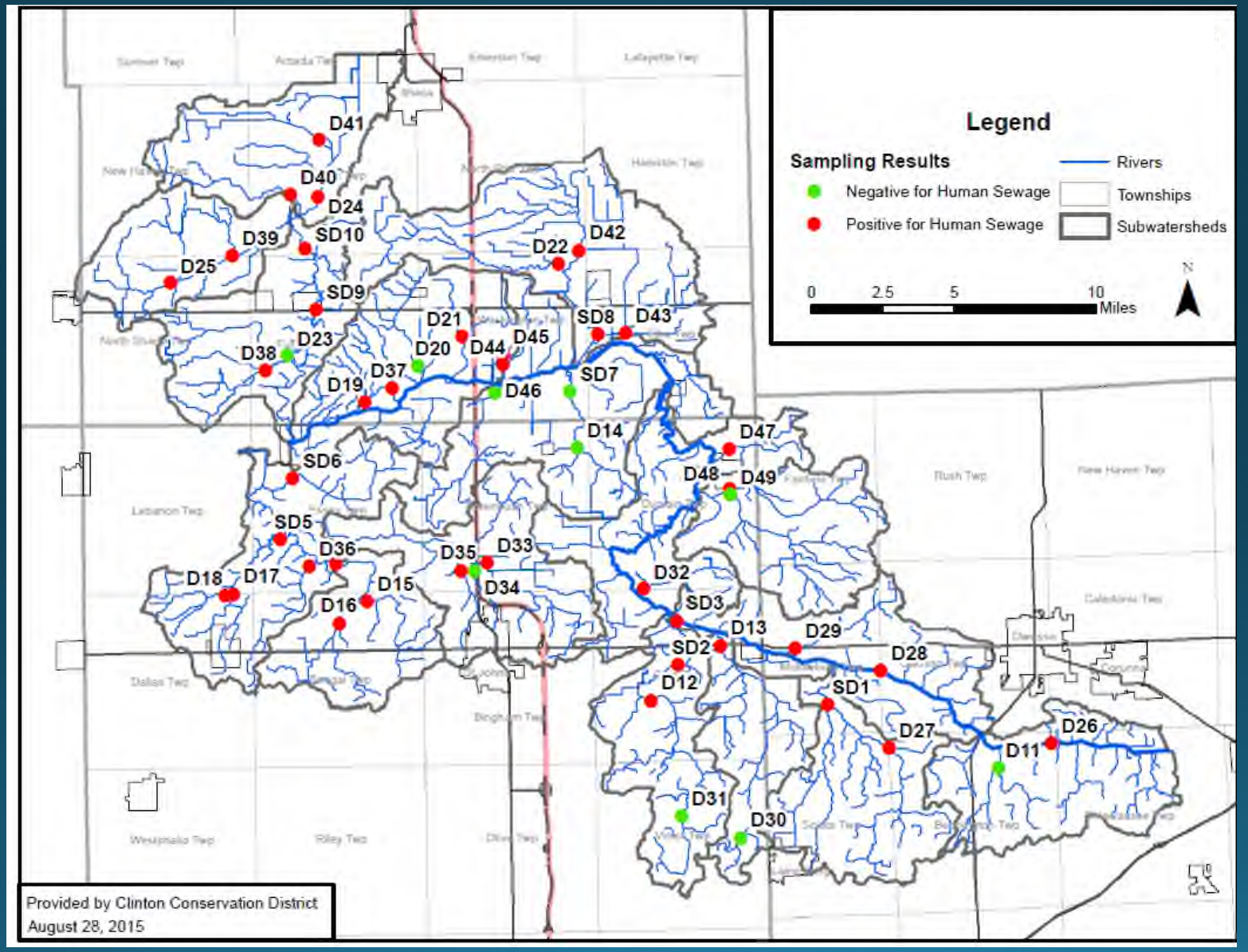


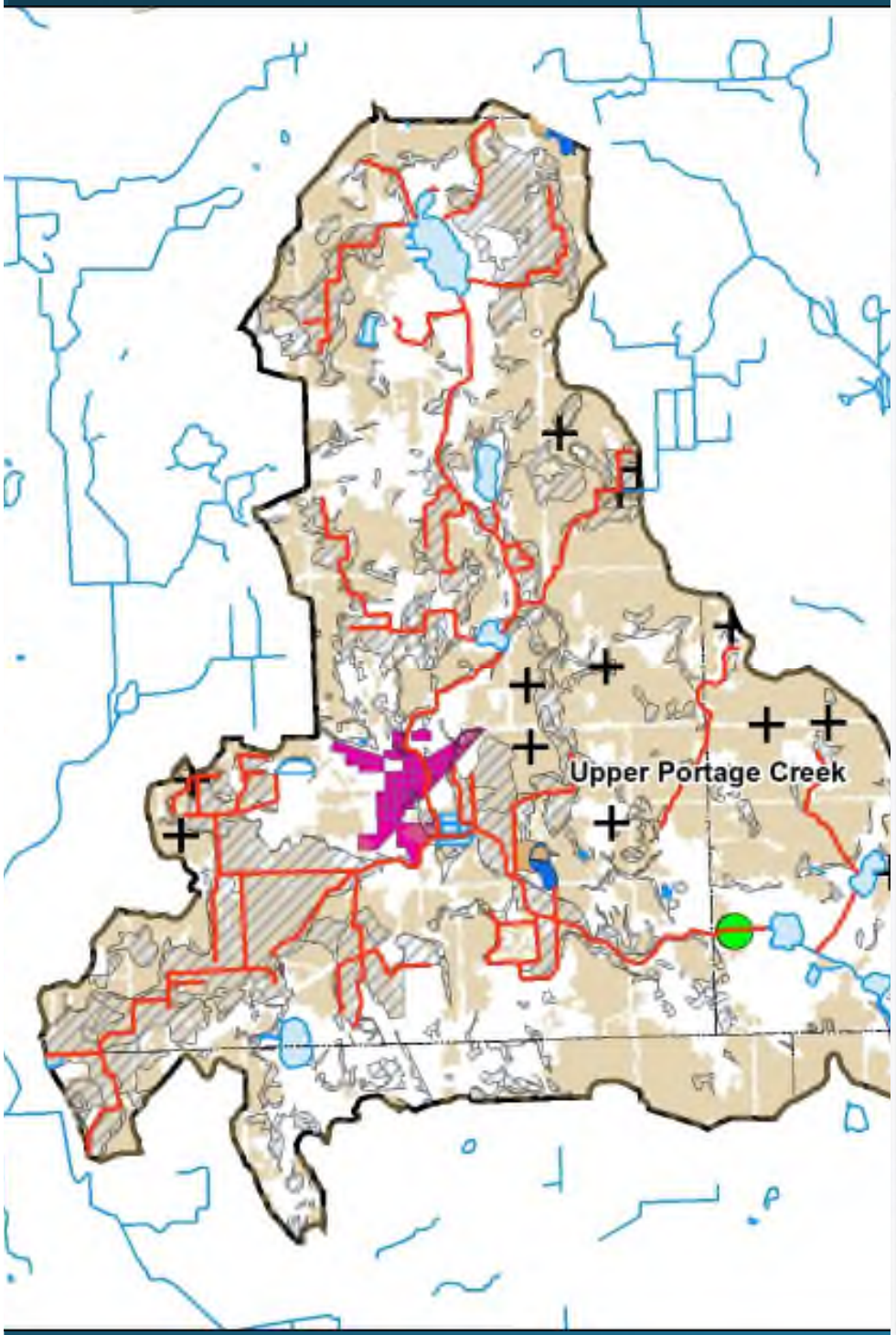
Example of a Nonpoint Source: Failing Septic Systems

Source Assessment

- Over 4,000 residential failures were reported to the DEQ by local health departments in 2013
- Leading causes of failure in 2013 were:
  - soil clogging in the 'adsorption field'
  - root intrusion into the field
  - and hydraulic overload

Courtesy of Clinton County Conservation District – CMI Funded Project





Identify

Identify from: Watersheds

Location: 731,892.868 4,706,060.404 Meters

Field	Value
HUC_12	040900050304
HU_12_NAME	Upper Portage Creek
area_sqmi	22.27
Cultivated%	34
High Intensity Developed %	0
Low Intensity Developed %	3
Medium Intensity Developed %	1
Open Developed %	3.9
Hay/Pasture %	21
Water %	2
Total Developed Land %	7.8
Total Agricultural %	55
Total Wetland %	19
Forest %	16
Human Population #	2690
Housing Units #	1110
Population Density per sq. mi.	
Housing Unit Density per sq. mi.	
Lost Wetlands (% of presettlement)	
Natural Buffers %	
New Developed Land (sq. mi)	
New Cultivated Land (sq. mi)	
Impervious %	
Hogs (estimated)	
Cattle (estimated)	
Percent of ag. land that is tiled (estimated)	
Percent of ag. land that is used for manure application (estimated)	
Approx. Number of Septic Systems (coming soon)	559

559 Septic Systems

Identified 1 feature

Example of a Nonpoint Source: Failing Septic Systems

Reasonable Assurance

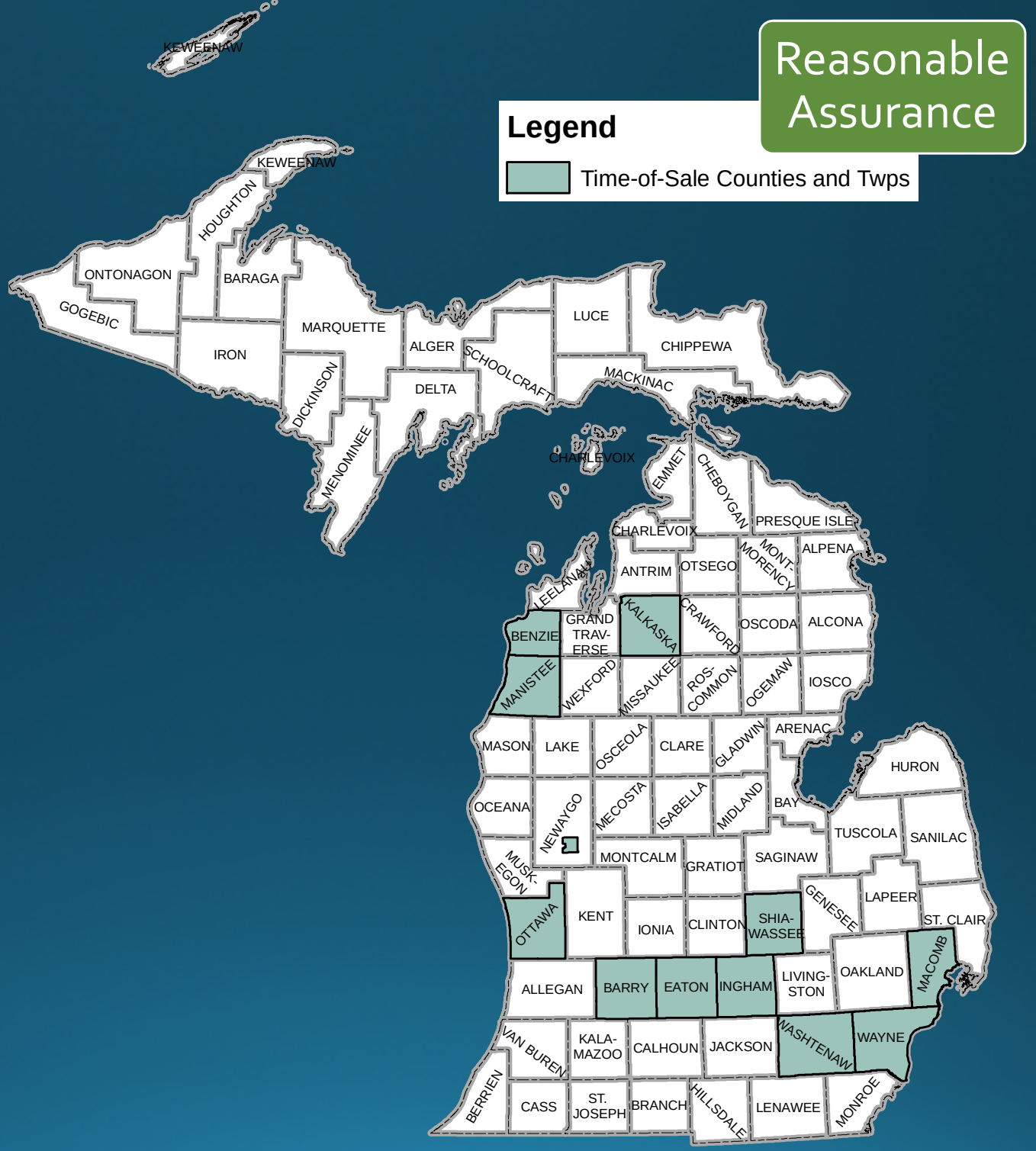
- County or local sanitary health codes are the primary means of regulation
- Discharge of raw sewage is illegal under Michigan Law (Part 31), so the DEQ can escalate enforcement against municipalities with significant sewage issues
- Statewide Sanitary Health Code?
  - Michigan is the only state without one

Example of a Nonpoint Source: Failing Septic Systems

Reasonable Assurance

- Clean Water Act Section 319 funding can be used to identify areas with issues
- Where a time-of-sale ordinance is in place, 319 funding can be used to help repair/replace septics

Example of a Nonpoint Source: Failing Septic Systems

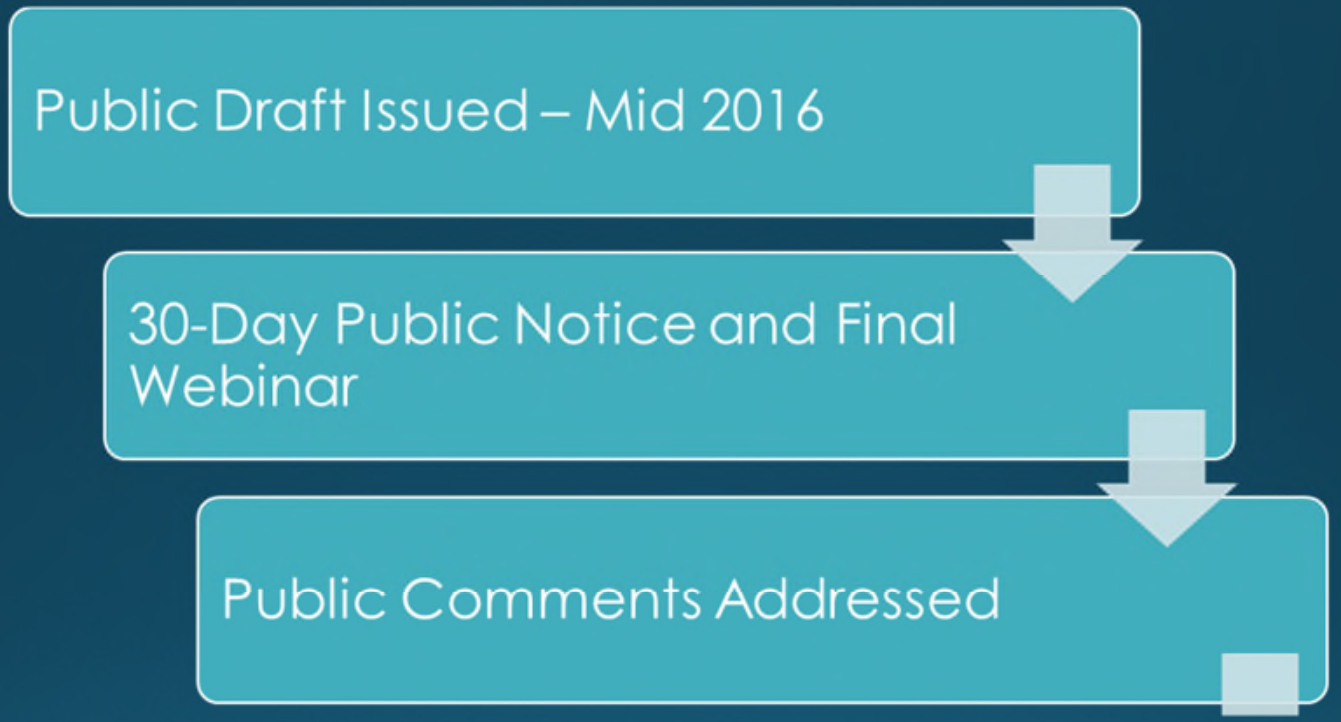


Next Steps

- Public Draft Issued – Mid 2016

Public Draft Issued – Mid 2016

30-Day Public Notice and Final Webinar


Public Draft Issued – Mid 2016
30-Day Public Notice and Final Webinar
Public Comments Addressed

Public Draft Issued – Mid 2016

30-Day Public Notice and Final Webinar

Public Comments Addressed

Submitted to USEPA once 2016 303d list is approved by them

What will be covered in the next webinar?

- Discussion of the existing data from our impaired waters
- Critical conditions that cause *E. coli* to be high
- Results of statewide study of watershed conditions that cause high or low *E. coli*
- *Different* examples of Source Assessment/Reasonable Assurance
- Critical portions of the document for your review and comment.

How do you stay in the loop?

- If you registered for this webinar, you are on our contact list.

Contact Me

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