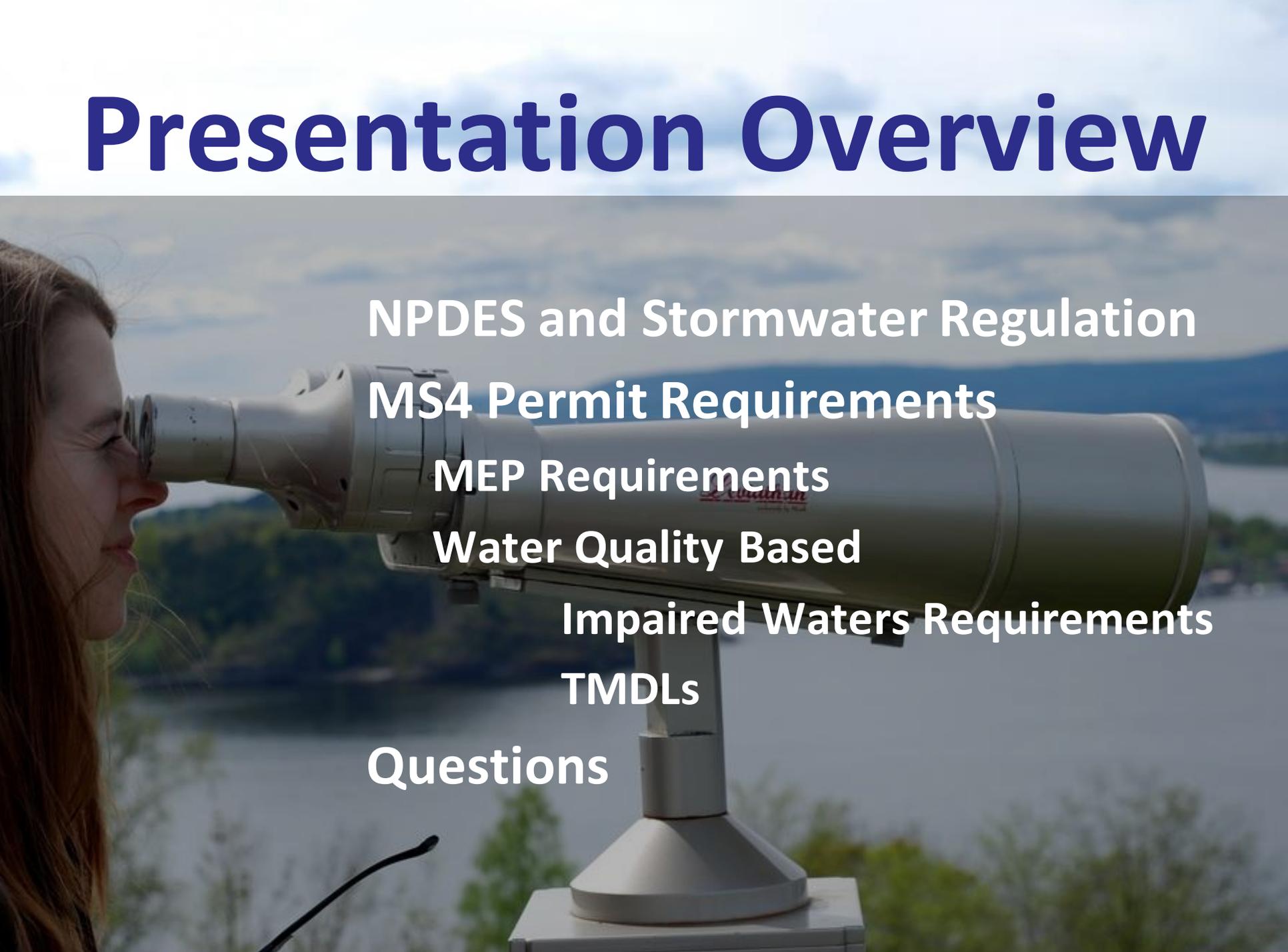


2014 Draft Massachusetts MS4 Permit

Newton Tedder
EPA New England

Presentation Overview

A woman with long brown hair is shown in profile on the left, looking through a large, silver telescope. The telescope is mounted on a stand and is pointed towards the right. The background is a scenic view of a lake, green hills, and a blue sky with light clouds. The text of the presentation overview is overlaid on the right side of the image.

NPDES and Stormwater Regulation

MS4 Permit Requirements

MEP Requirements

Water Quality Based

Impaired Waters Requirements

TMDLs

Questions

This presentation is for informational purposes only. Any comments made by the presenter or attendees is not part of the administrative record for this draft permit. Any comments that participants wish to be part of the administrative record must submit be submitted in writing to EPA during the public comment period or orally during the public hearing.

**Public Comment Period: September 30, 2014 –
December 29, 2014**

Public Hearing:

Date: November 19, 2014

Time: 1:00pm

Location: Leominster Public Library
(Community Room), 30 West Street,
Leominster, Massachusetts 01453.

Clean Water Act - 1972

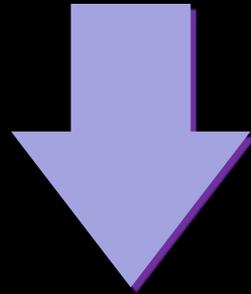


Goal



CWA Section 4

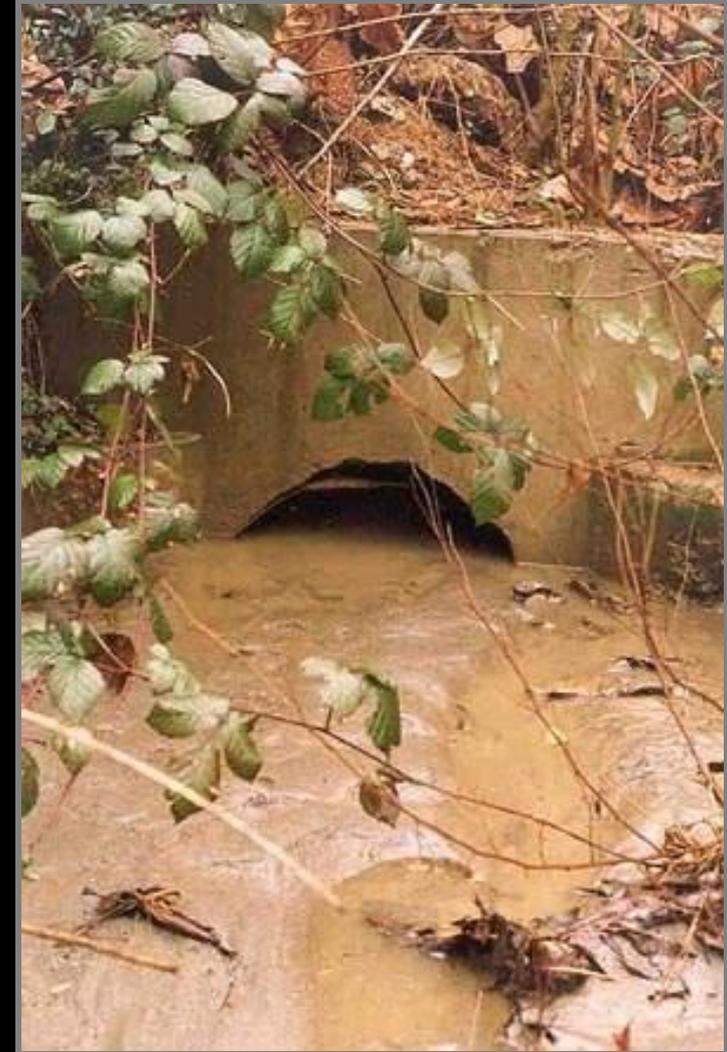
All “point” sources
“discharging pollutants”
into “waters of the U.S.”



Must obtain an NPDES permit from
an authorized state or EPA

Nationwide Urban Runoff Program (NURP)

- ▶ Conducted by EPA between 1979 and 1983
- ▶ First comprehensive study of urban runoff pollution across U.S.
- ▶ Found high levels of heavy metals, fecal coliform, TSS, nutrients and hydrocarbons in urban runoff



Regulatory History

- ▶ Before 1987 stormwater considered a non-point source and not regulated
- ▶ Water Quality Act of 1987 required NPDES permitting of certain stormwater discharges
 - Medium and large municipalities (serving over 100,000 persons)
 - Industrial activities
 - Others, as determined by EPA, “to protect water quality”

Stormwater Regulatory Framework

National

Clean Water Act, Section 402(p)

EPA NPDES Regulations, 40 CFR 122

← Authorized States →

← Unauthorized States →

State Laws and Regulations
(CT, RI, VT, ME)

State by State

State NPDES Permits

EPA NPDES Permits
(MA and NH)

Regulated Universe

MS4s, Construction Sites, Industrial Facilities

Phase I Program

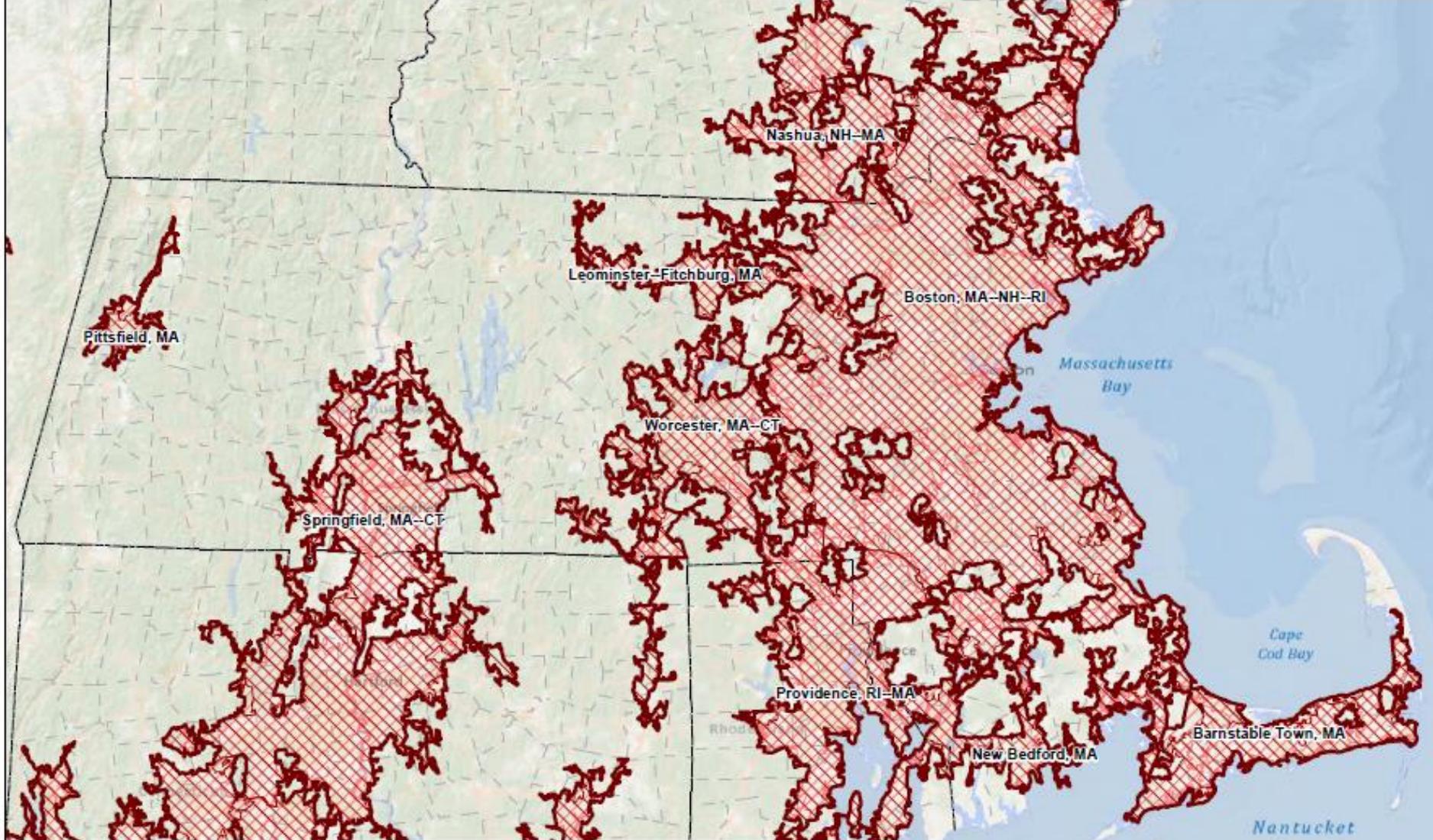
- ▶ Stormwater management program must reduce the discharge of pollutants to the maximum extent practicable (MEP) and protect water quality
- ▶ Medium and large municipalities (over 100,000)
- ▶ Industrial activity
(11 categories)
- ▶ Construction over
5 acres



Phase II Coverage

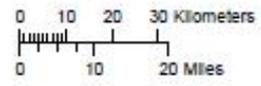
- ▶ 1995 Report to Congress, EPA determined that small municipalities also needed regulation – Regulations passed in 1999
- ▶ Permitting authorities can also designate additional small MS4s that are outside of urbanized areas
- ▶ Includes non-traditional MS4s within urbanized areas, such as:
 - Military bases
 - Public universities
 - Prisons, etc.
- ▶ First Massachusetts Phase II Permit: 2003





Massachusetts

NPDES Phase II
Stormwater Program
Automatically Designated
MS4 Areas

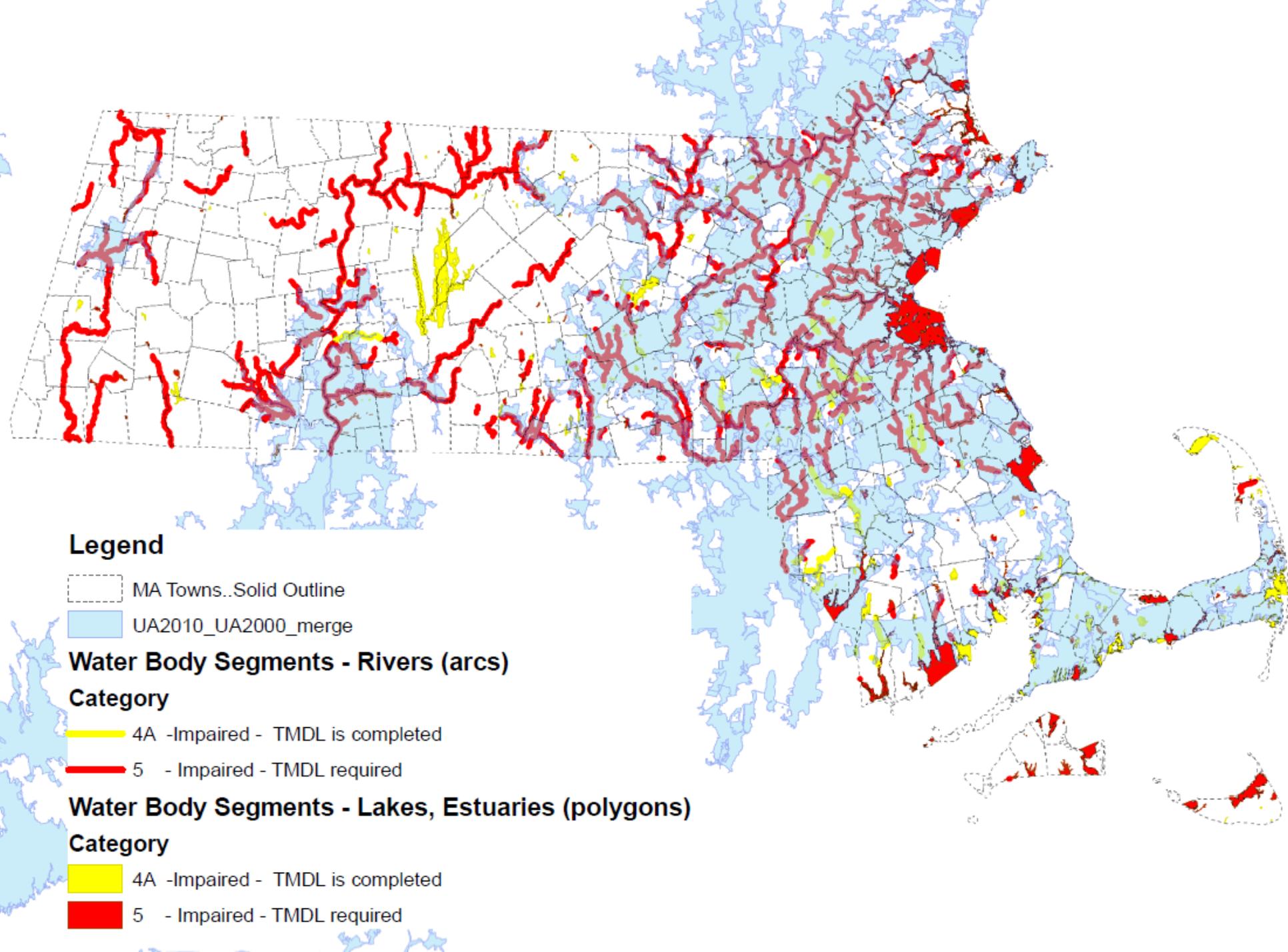


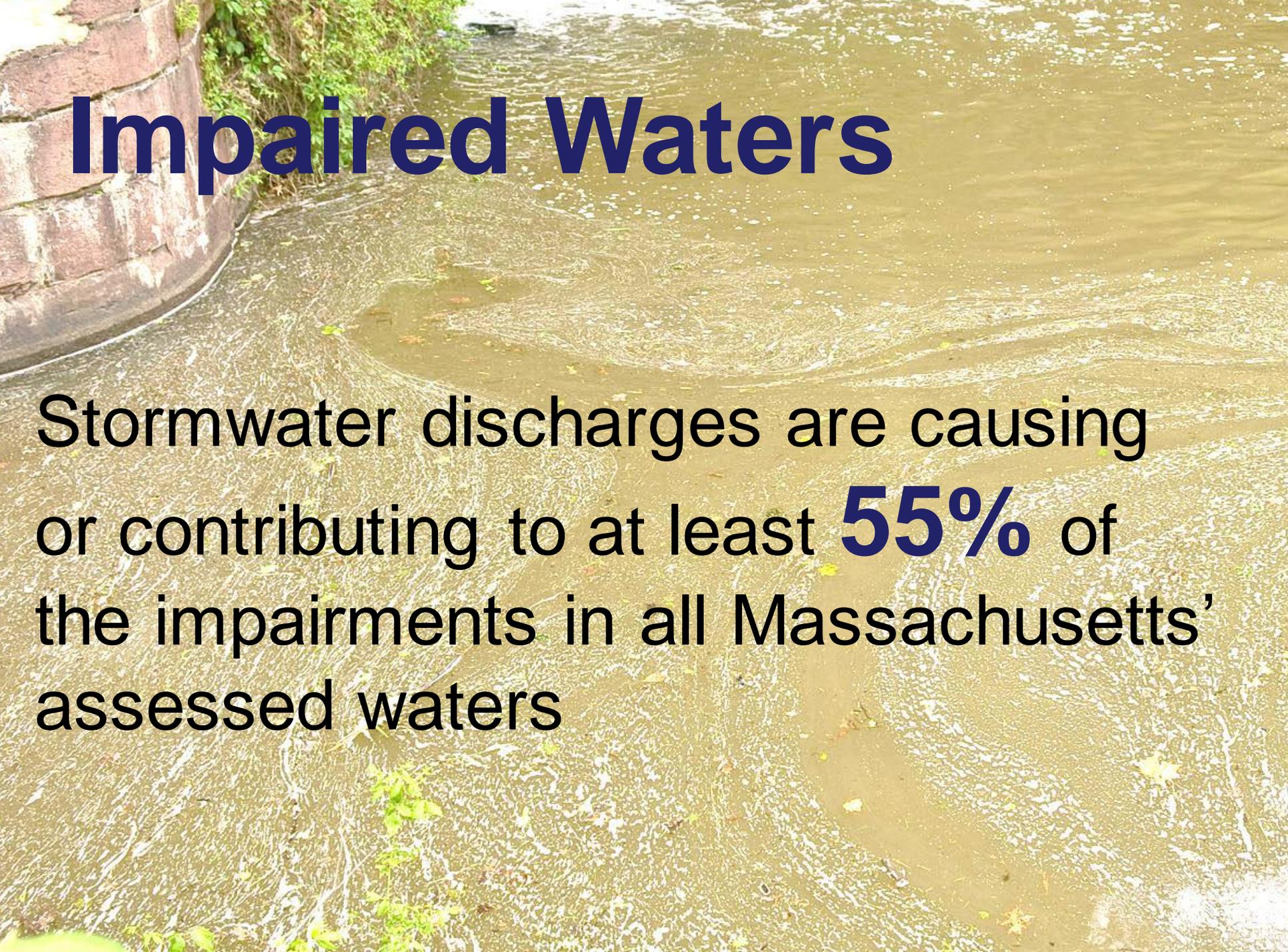
Regulated Area:



Urbanized Areas, Town Boundaries:
US Census (2000, 2010)
Base map: US National Park Service

US EPA Region 1 GIS Center Map #8824, 11/19/2012





Impaired Waters

Stormwater discharges are causing or contributing to at least **55%** of the impairments in all Massachusetts' assessed waters



Draft Massachusetts MS4 Permit Requirements

NOI and SWMP

Required NOI Info

Basic Info

2003 permit items

Endangered Species

Historic Properties

BMPs

Cert & signature



Notice of Intent - NOI

Notice of Intent (NOI) for coverage under Small MS4 General Permit Page 1 of 14

Part I: General Conditions

General Information

Name of Municipality or Organization: State

EPA NPDES Permit Number:

Primary MS4 Program Manager Contact Information

Name: Title:

Street Address Line 1

City State Zip Code

Fax Number:

Check the box if your municipality or organization was covered under the 2003 MS4 General Permit

Stormwater Management Program (SWMP) Location

Eligibility Determination

Endangered Species Act (ESA) Determination Complete? Eligibility Criteria (check all that apply): A B C D E F

National Historic Preservation Act (NHPA) Determination Complete? Eligibility Criteria (check all that apply): A B C D

MS4 Infrastructure (if covered under the 2003 permit)

Due 90 days from effective date of permit
Information required on NOI
Public notice of the NOI
Authorization to discharge

Elements of SWMP

Description & details

Map

Annual evaluation





MEP Requirements

Six Minimum Measures

1. Public education
2. Public involvement
3. Illicit discharge detection & elimination
4. Construction runoff
5. Post-construction stormwater management
6. Pollution Prevention

Shared Responsibility

The regulations, 40 CFR 122.35, allow for MS4s to share responsibility for the implementation of the six minimum measures



Public Education and Outreach

▶ Four Audiences

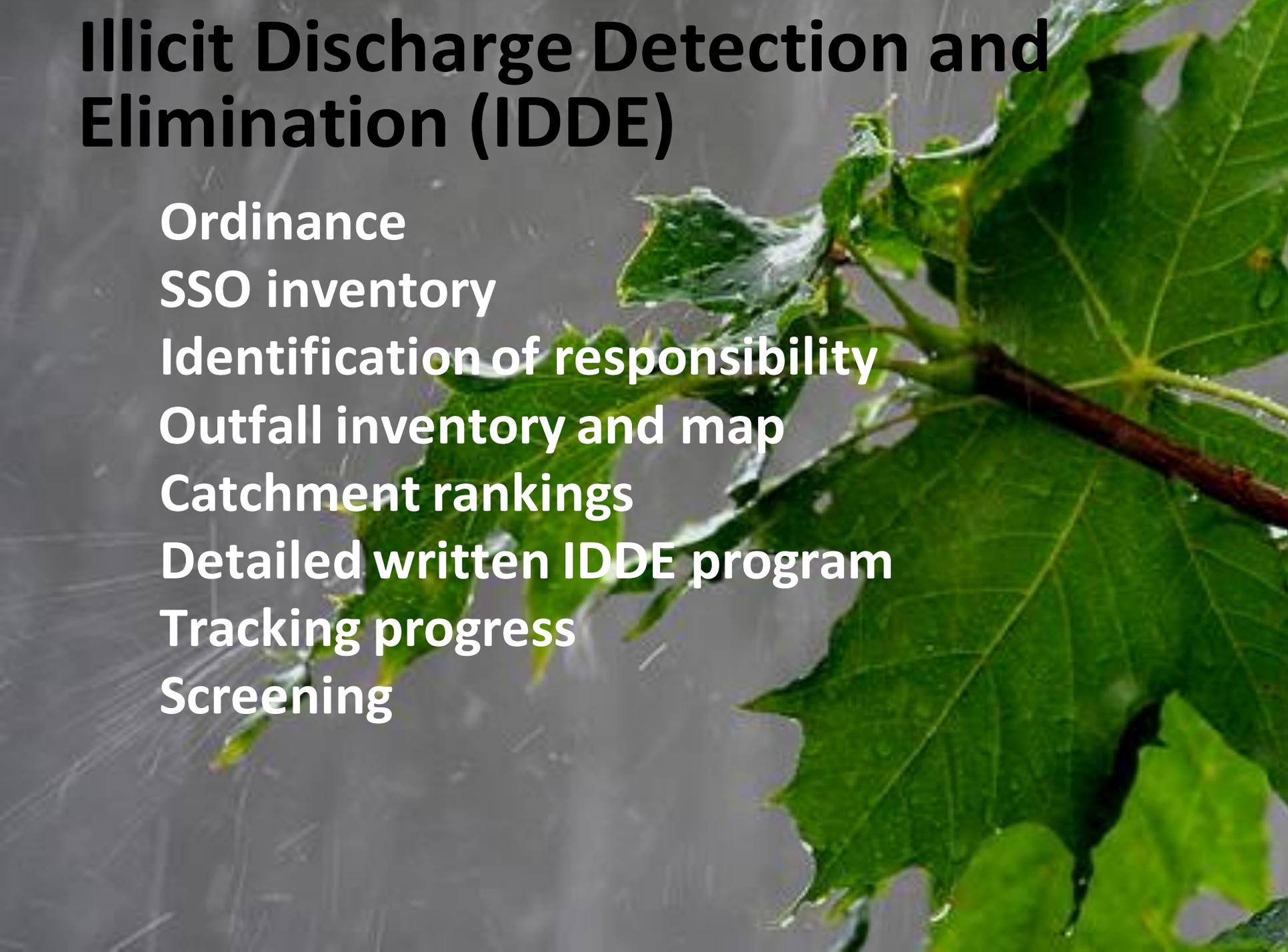
- Residents
- Businesses and commercial facilities
- Developers
- Industrial Facilities

▶ Two messages to each audience over the permit term

Public Involvement and Participation

- ▶ Public review of SWMP
- ▶ Make all reports available to the public

Illicit Discharge Detection and Elimination (IDDE)



Ordinance

SSO inventory

Identification of responsibility

Outfall inventory and map

Catchment rankings

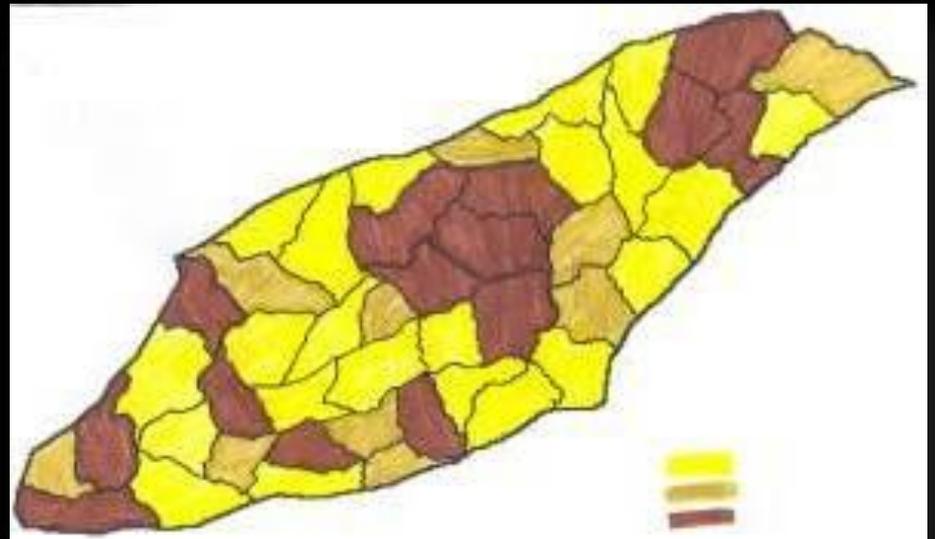
Detailed written IDDE program

Tracking progress

Screening

IDDE - Catchment Ranking

- Excluded Catchments
- Problem Catchments
- High Priority Catchments
- Low Priority Catchments

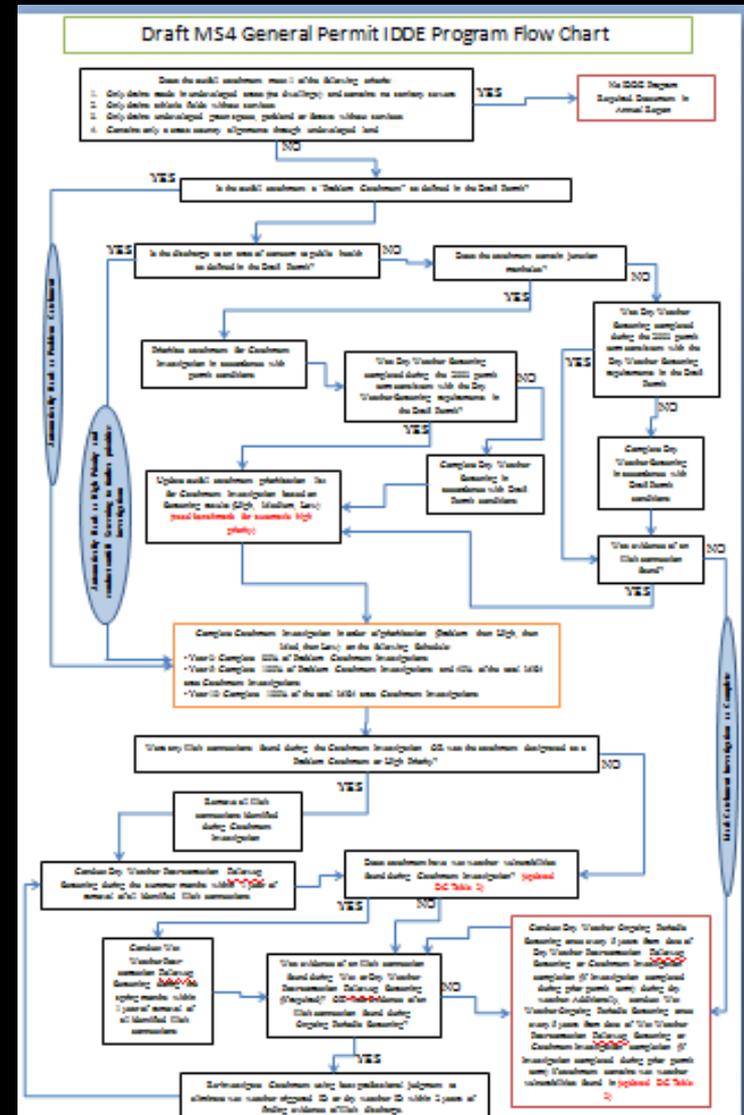


Dry Weather Screening

- Completed Year 3
- Catchments Ranked High or Low Priority only

Wet Weather Screening

- Completed as part of IDDE procedure
- Catchments with “System Vulnerability Factors” only



Screening

Residual chlorine, surfactants, ammonia, conductivity, salinity, temperature, bacteria and pollutant(s) of concern

**Construction Site
Runoff Control**

Ordinance

Site Inspection procedures

Sediment control requirements

Requirements to control waste

Site Plan Review



Post-Construction Stormwater Management



Updated Ordinance

Retain and or treat the first 1" of runoff from IA on site from new and re-development disturbing ≥ 1 acre



Street design &
Parking assessment

Green infrastructure

Tracking impervious area

Good Housekeeping

O&M procedures

Catch basin cleaning

Street sweeping

SWPPP





Water Quality Requirements



Discharges to Impaired Waters

Discharges to waters
without a TMDL

Discharges to waters
with an Approved TMDL

Approved TMDLs

Long Island Sound
Nitrogen TMDL

Phosphorus and
Metals TMDLs for
Rhode Island
Waters

Bacteria and Pathogen
TMDLs

Charles River Phosphorus
TMDLs

Lake and Pond
Phosphorus TMDLs

Cape Cod Nitrogen
TMDLs

Assabet River Phosphorus
TMDL



Urban Stormwater Phosphorus



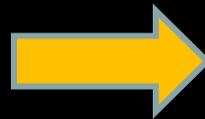
Tends to be associated with very fine particles ~ 40 microns

Much is washed from impervious surfaces with small amounts of rainfall (e.g., 0.3 inches)

Stormwater controls must have filtration component to be effective

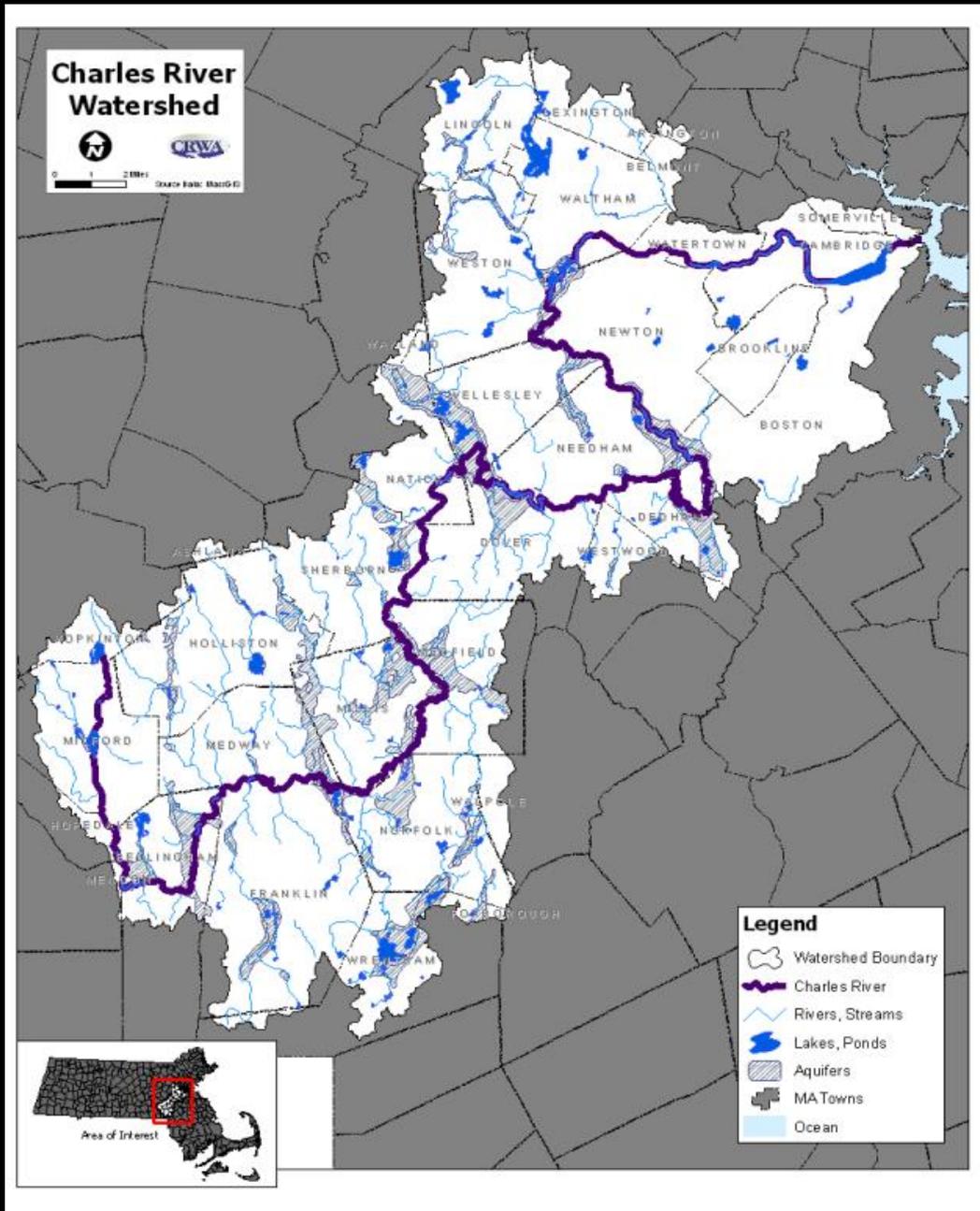
Assabet River and Lake and Pond Phosphorus TMDLs

***EXCESSIVE
PHOSPHORUS***



- ▶ Reduced clarity
- ▶ Noxious scums
- ▶ Toxic blooms
- ▶ Surface waters choked with plant matter
- ▶ Low dissolved oxygen for aquatic life (e.g., fish)

Charles River TMDLs



PCP – Phased Approach

5 years after permit effective date	5-10 years after permit effective date	10-15 years after permit effective date	15-20 years after permit effective date
Create Phase 1 Plan	Implement Phase 1 Plan		
	Create Phase 2 Plan	Implement Phase 2 Plan	
		Create Phase 3 Plan	Implement Phase 3 Plan

Phase 1 First 5 Years

Component	Year 1	Year 2	Year 3	Year 4	Year 5
Legal analysis	Active	Active	Completed	Completed	Completed
Funding source assessment.	Active	Active	Active	Completed	Completed
Define scope of PCP (PCP Area) Baseline Phosphorus Load and Phosphorus Reduction Requirement and Allowable Phosphorus Load	Active	Active	Active	Active	Completed
Description of Phase 1 planned nonstructural controls	Active	Active	Active	Active	Active
Description of Phase 1 planned structural controls	Active	Active	Active	Active	Active
Description of Operation and Maintenance program for structural controls	Active	Active	Active	Active	Active
Phase 1 implementation schedule	Active	Active	Active	Active	Active
Estimated cost for implementing Phase 1 of the PCP	Active	Active	Active	Active	Active
Complete Written Phase 1 PCP	Active	Active	Active	Active	Active

Choose a Scope

Regulated Area Required Reductions

Community	Baseline Watershed Phosphorus Load, kg/yr	Phosphorus Load Reduction Requirement, kg/yr	Allowable Stormwater Phosphorus Load, kg/yr	Percent Reduction in Phosphorus Load (%)
Bellingham	812	304	508	37%

Jurisdictional Area Required Reductions

Community	Baseline Phosphorus Load, kg/yr	Phosphorus Load Reduction Requirement kg/yr	Allowable Stormwater Phosphorus Load, kg/yr	Percent Reduction in Stormwater Phosphorus Load (%)
Bellingham	958	344	614	36%

Phase 1 Milestones

Year 8

$$P_{exp} \leq P_{allow} + (P_{RR} \times 0.80)$$

Year 10

$$P_{exp} \leq P_{allow} + (P_{RR} \times 0.75)$$

Enhanced Non-Structural Best Management Practices Eligible for Phosphorus Reduction Credits (BMPs)

▶ Enhanced non-structural Best Management Practices

- Enhanced sweeping program (1-15% credit)
- Semi-annual catch basin cleaning (2% credit for P)
- No application of fertilizers containing phosphorus (50% credit for lawns)
- Weekly leaf litter and organic debris collection program (5% credit for P)

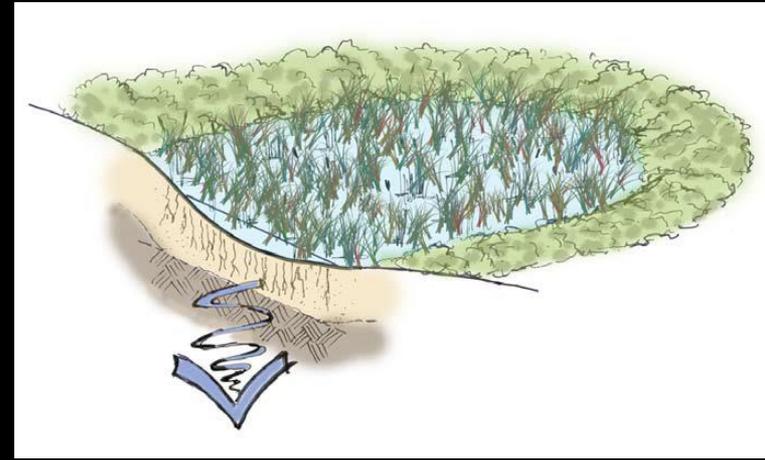
Attachment 2 to App. F to Permit provides methodology for calculating default phosphorus reduction credits for enhanced non-structural Best Management Practices



Structural Best Management Practices for Phosphorus Reduction Credit

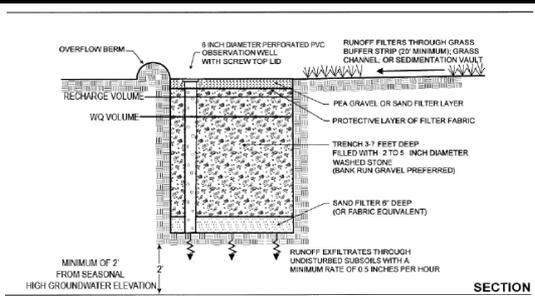
- ▶ Infiltration practices are highly effective at managing stormwater runoff
 - Surface infiltration (e.g., basins, swales, rain gardens)
 - Subsurface infiltration (e.g., trench and chambers)

Excellent for phosphorus and bacteria removal and replenishing ground water aquifers

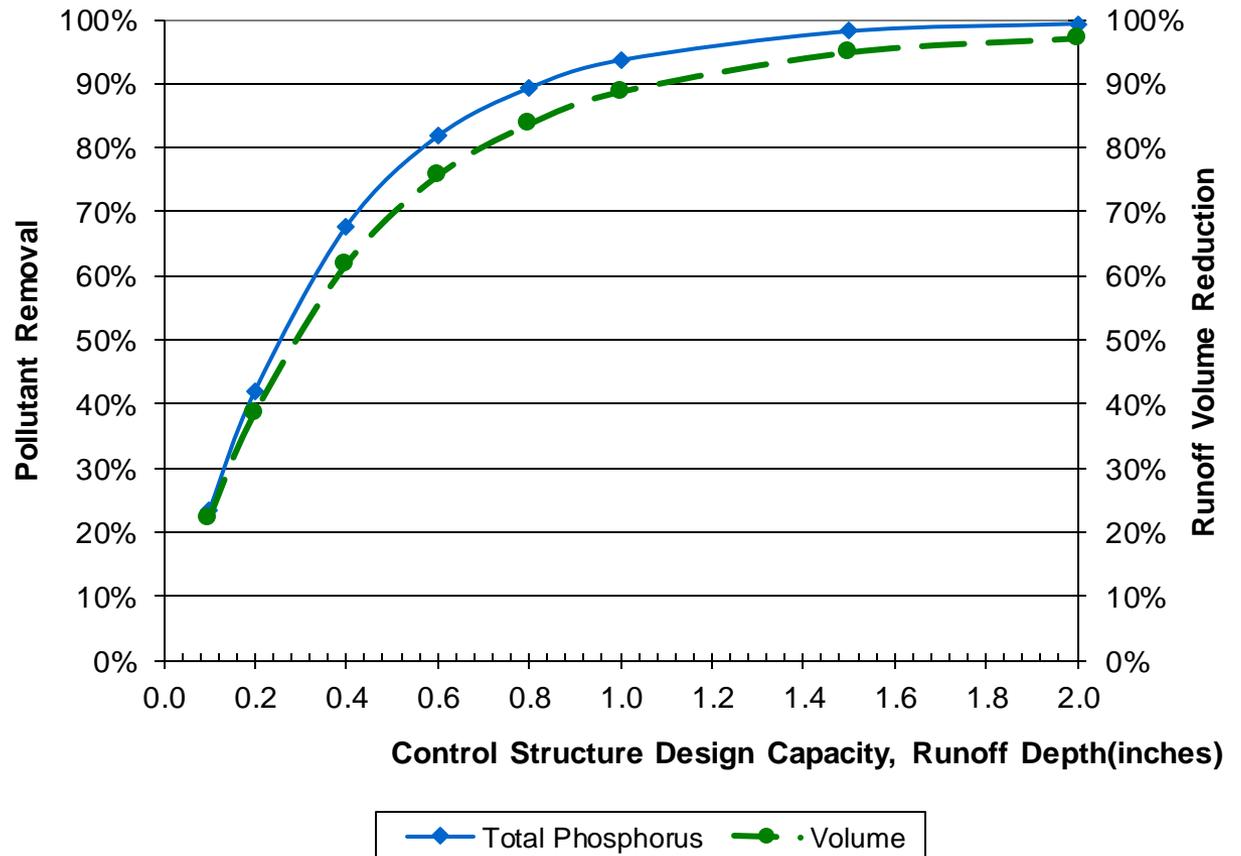


Long-Term Cumulative Performance Curve for Infiltration Trench

Attachment 3 to Appendix F of draft MA MS4 Permit



BMP Performance Curve: Infiltration Trench
(Soil infiltration rate 0.52 in/hr)



Other Structural BMPs for Phosphorus Reduction Credit (continued)

- Bio-filtration systems
- Filter systems
- Gravel wetlands
- Commercial or proprietary treatment systems
- Permeable pavements

Attachment 3 to App. F to the Permit provides a methodology to calculate phosphorus removal credits for several structural BMPs based on physical storage capacity

Phase 2 and 3

Complete By Year 10 and 15

Update Legal analysis
Description of Phase 2 or 3 planned nonstructural controls
Description of Phase 2 or 3 planned structural controls
Updated description of Operation and Maintenance Program
Phase 2 implementation schedule
Estimated cost for implementing Phase 2 or 3 of the PCP
Complete written Phase 2 or 3 Plan

Phase 2 and 3 Milestones

Year 13

$$P_{exp} \leq P_{allow} + (P_{RR} \times 0.65)$$

Year 15

$$P_{exp} \leq P_{allow} + (P_{RR} \times 0.50)$$

Year 18

$$P_{exp} \leq P_{allow} + (P_{RR} \times 0.30)$$

Year 20

$$P_{exp} \leq P_{allow}$$



Discharges to Waterbodies *Without* an Approved TMDL

Additional requirements for
Bacteria, Nutrients, Solids,
Chloride, Metals and Oil and
Grease

NSQD urban stormwater

Parameter	Count	Median	Geometric Mean	Minimum	Maximum	25%	75%
Phosphorus Total (mg/l)	1967	0.25	0.26	0.02	10	0.15	0.42
Total Nitrogen (mg/L)	1763	2.0	2.0	1.0	7.0	1.0	3.0
Fecal Coliform (colonies/100 ml)	524	4500	3578	2.0	5230000	800	26000
Total E Coli (colonies/100 ml)	25	1100	1366	10	35000	460	8500
Chloride (mg/l)	57	6.0	7.0	1.0	350	4.0	10
Turbidity (NTU)	12	106	98	16	630	43	176
Total Suspended Solids (mg/l)	2046	45	46	1.0	2405	22	95
Oil and Grease Total (mg/l)	390	5.0	4.8	0.2	570	2.5	8.5
Zinc Total (ug/l)	1592	105	89	1.4	3050	50	190

Discharges To Bacteria Impaired Waters

- If discharge contains illicits remove in 60 days
- Additional BMPs
 - Public Education
 - IDDE



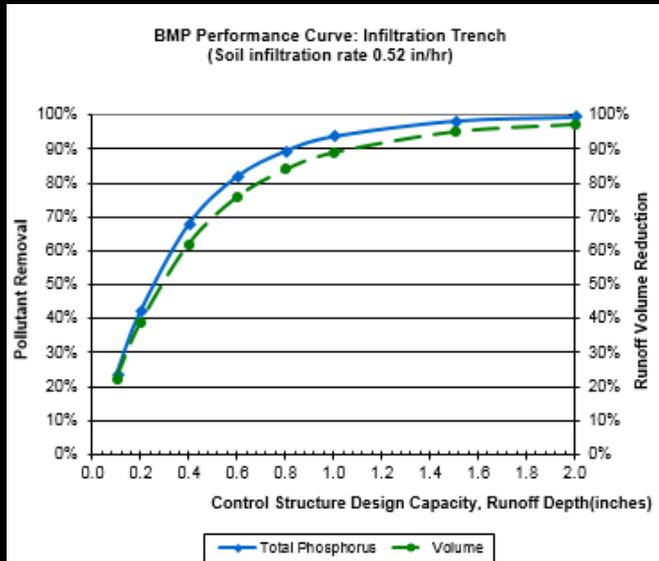


Discharges To Nutrient Impaired Waters or their Tributaries

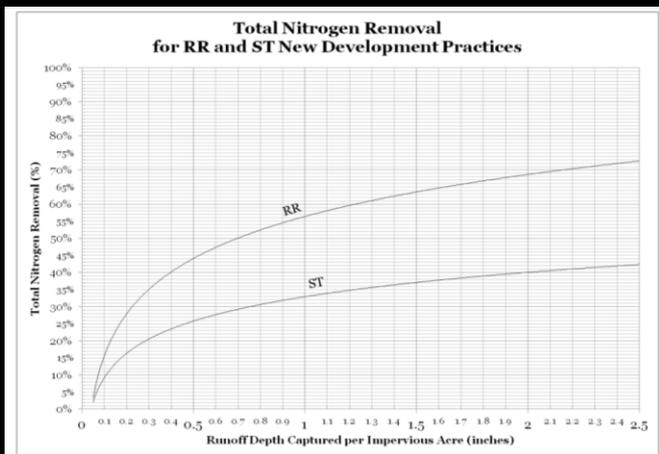
Enhanced BMPs

- **Public Education**
- **New Development/
Redevelopment**
- **Good Housekeeping**

Nutrient Source Identification Report



- Due Year 4
- Delineate potential N or P sources
- ID potential retrofits
- 1 demonstration project by year 6
- Tracking of N or P reductions through implementation of structural BMPs



Discharges To Chloride Impaired Waters

Salt Reduction Plan

- Track the amount of salt applied
- New or modified equipment
- Adopt application rate guidelines
- Training for applicators
- Equipment Calibration
- No Salt Zones



Discharges To Chloride Impaired Waters (cont)

Additional BMPs

- Mechanism to ensure private industry and commercial sites cover salt piles
- Public Education
- New Development and Redevelopment

Discharges To Sediment, Metals or Oil and Grease Impaired Waters

- If discharge contains illicits remove in 60 days
- Additional BMPs
 - New Development/ Redevelopment
 - Good Housekeeping



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Sidewalk Tree – Credit: <http://www.flickr.com/photos/madmardign777/79436383/>

Letters – Credit: <http://www.flickr.com/photos/calliope/234447967/>

Ruler – Credit: <http://www.flickr.com/photos/vrillusions/5197046091/>

Impaired waters, Algae, Impaired Lakes, Bacteria, Sediment/trash, Salt, LID street images, BMP near reservoir, Catch Basin - Credit: EPA

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Thank you

Questions ?

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tedder.newton@epa.gov**

Draft Permit Documents: http://www.epa.gov/region1/npdes/stormwater/MS4_MA.html