

Quinsigamond Community College 2016 MA Small MS4 Permit Overview

Presenters:

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@nitscheng

Date: May 1, 2023

Building better communities with you

Today's Presentation

- **What is Stormwater?**
- **2016 Small MS4 Permit Program Overview**
- **QCC Stormwater Management Program**

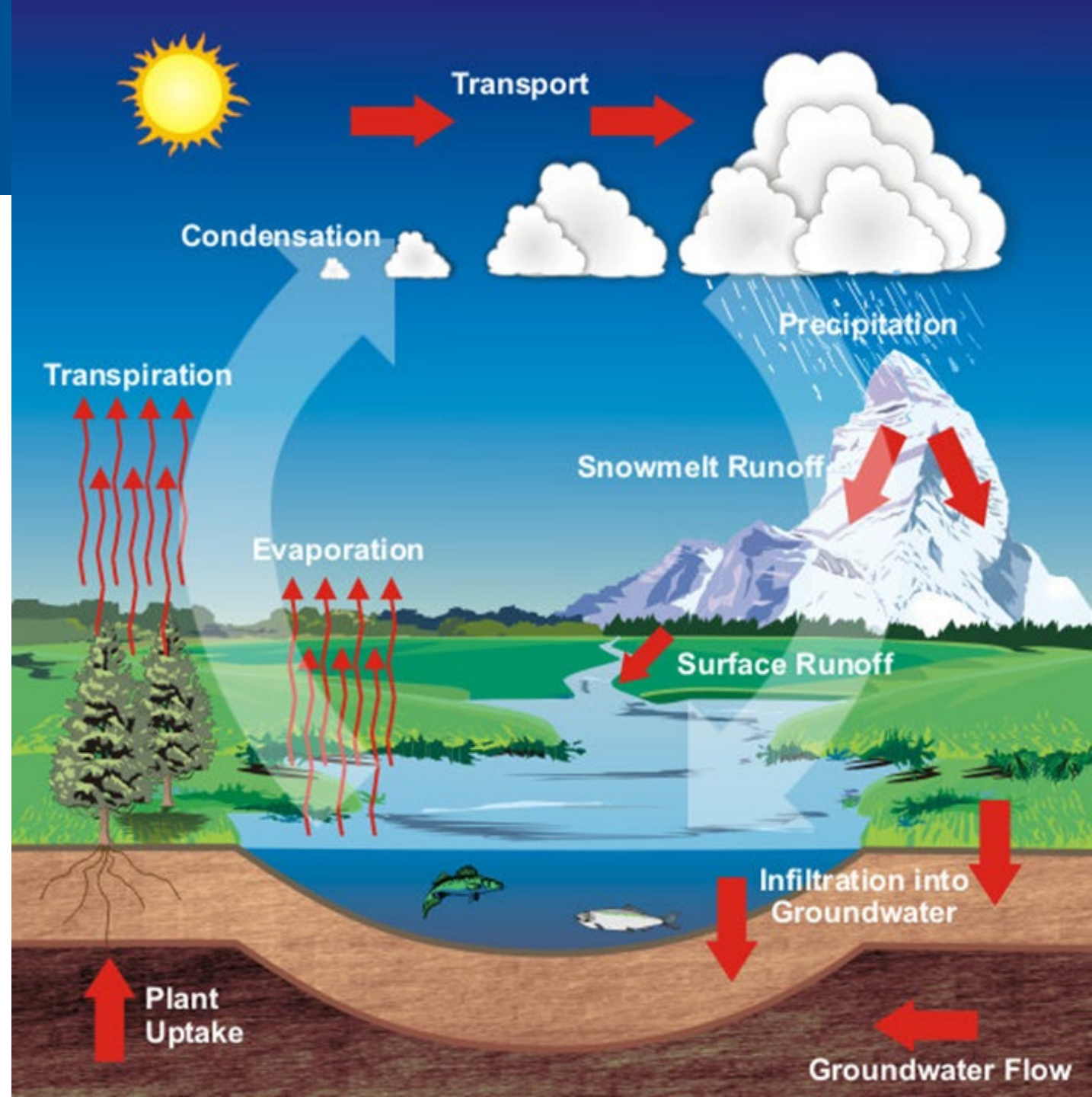


What is Stormwater?

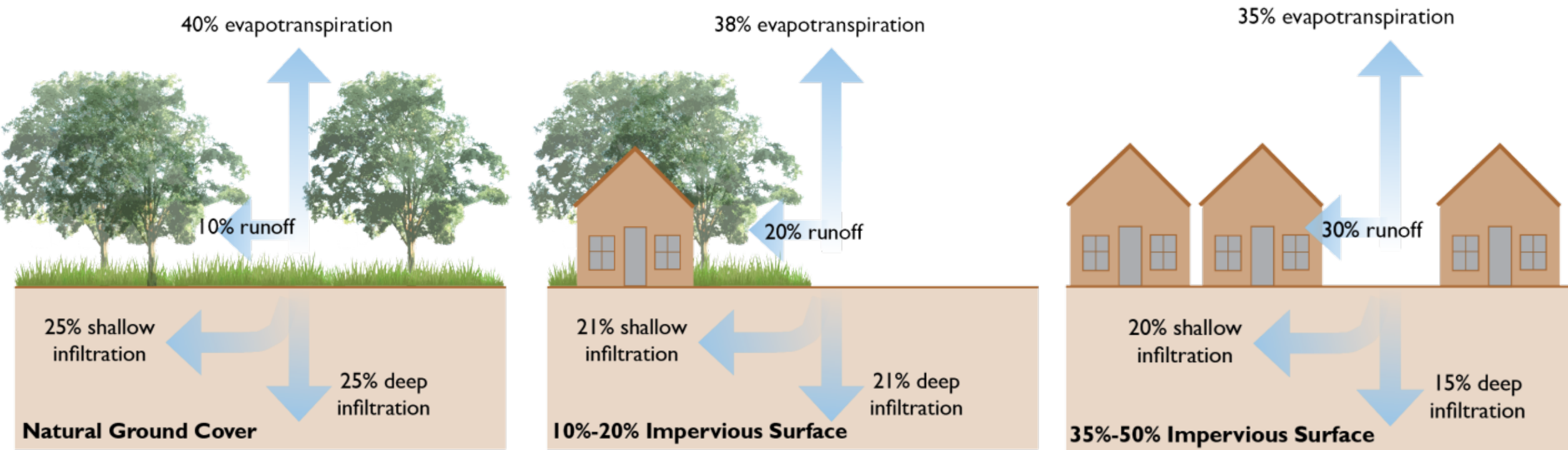


The Water Cycle

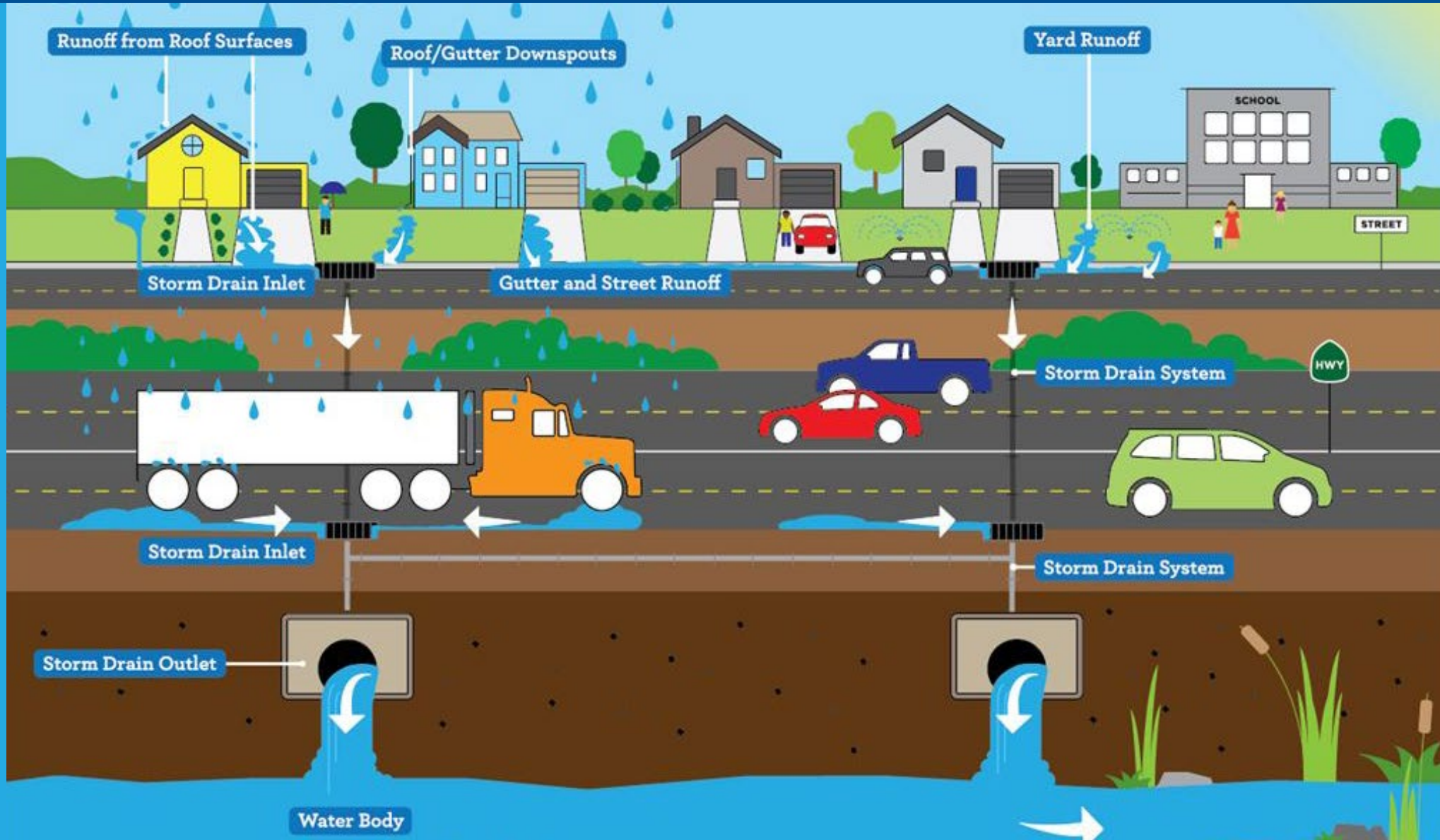
**Stormwater =
Surface Runoff**



Water Balance and Development



Stormwater Runoff



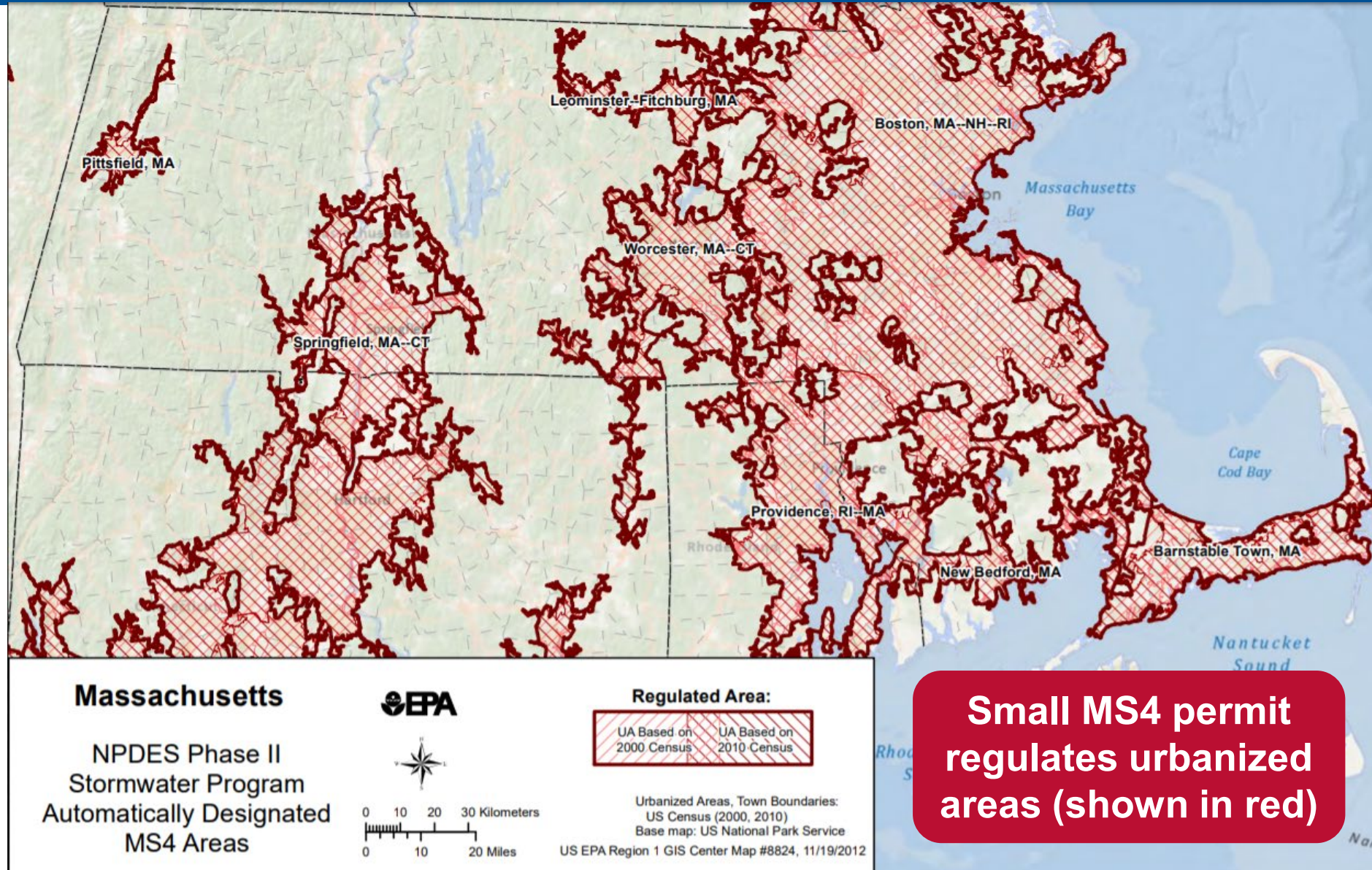
2016 MA Small MS4 Permit Program Overview



What is an MS4?

**MS4 =
Municipal
Separate
Storm
Sewer
System**

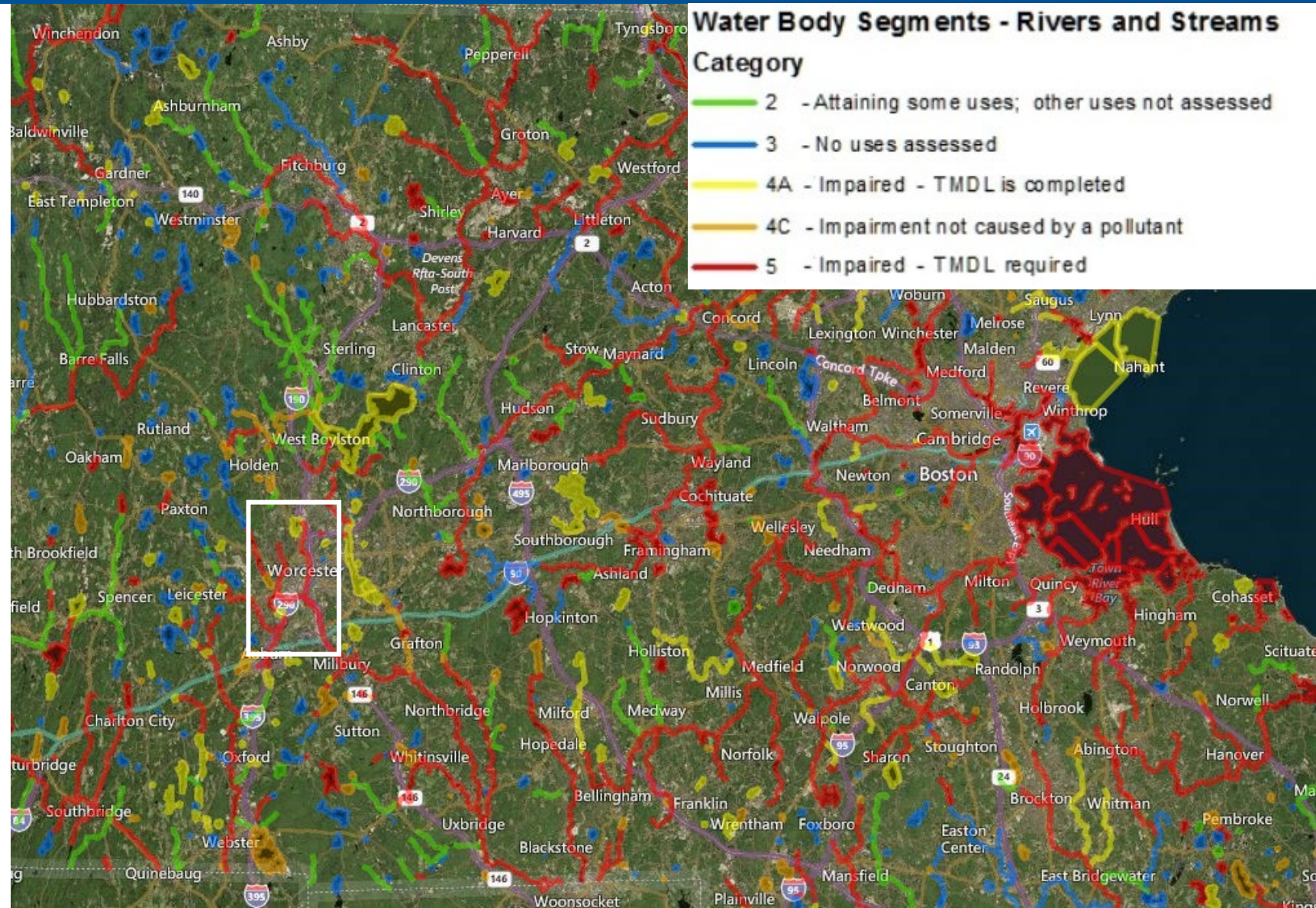
**An MS4 is a
system of
stormwater
conveyances that
discharges to
waters of the
United States.**



**Small MS4 permit
regulates urbanized
areas (shown in red)**

Why is an MS4 permit needed?

Even with the progress over the last 30 years, stormwater discharges are causing or contributing to at least 55% of the impairments in MA.



QCC isn't a municipality...

Why does it need a permit?

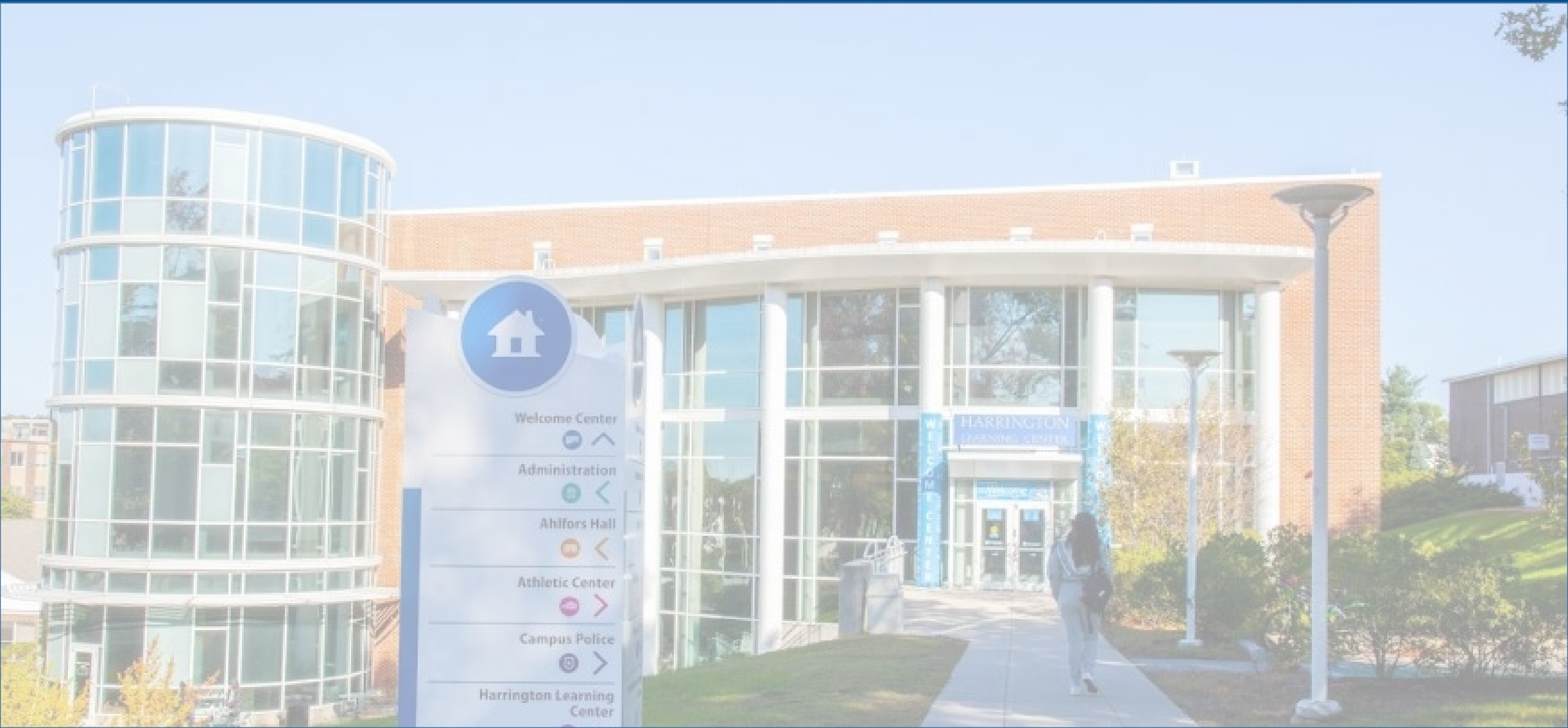
Non-Traditional MS4:

Any state facility in an urban area with a separate stormwater system

- Public Colleges
- State Hospitals
- Prisons
- State Parks
- Airports
- Highway Facilities
- **QUINSIGAMOND
COMMUNITY COLLEGE**



QCC Stormwater Management Program



Welcome Center



Administration



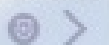
Ahlfors Hall



Athletic Center



Campus Police



Harrington Learning Center

QCC Stormwater Management Committee

- **Stephen Marini**, COO/CFO & VP of Administrative Services
smarini@qcc.mass.edu
- **Deb LaFlash**, Assistant Vice President of Finance/Comptroller
DLaFlash@qcc.mass.edu
- **Jim Racki**, Executive Director of Facilities Operations
jracki@qcc.mass.edu
- **Steve Zisk**, Director of Engineering, Energy, Environment, & Extension Campus Facilities
szisk@qcc.mass.edu
- **Brian O'Neil**, Facilities Manager
boneil@qcc.mass.edu

Regional Watershed Context



Impaired Waters

Downstream impairments include:

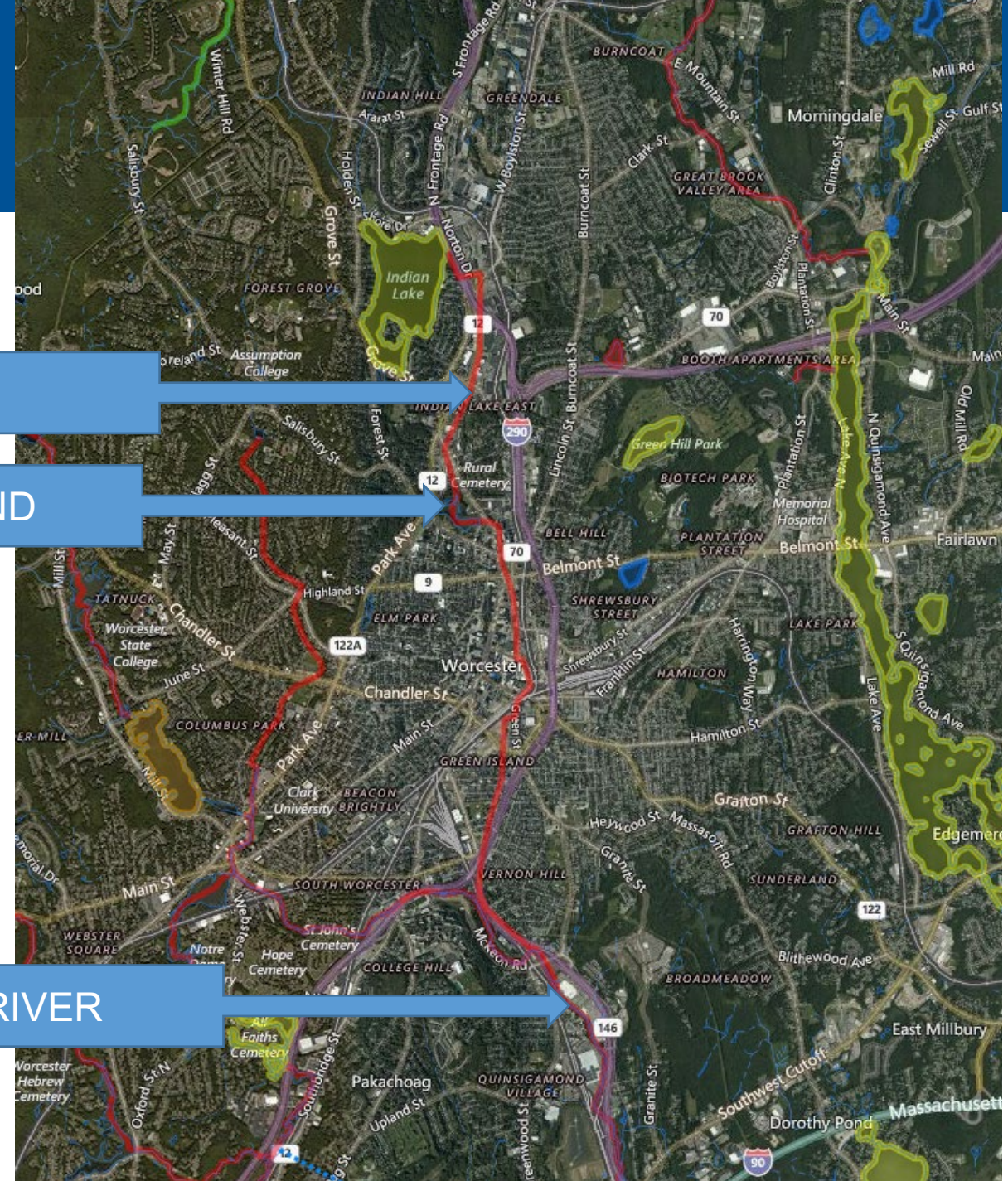
- Harmful algae blooms,
- Nutrients (nitrogen)
- Ammonia, and
- Fecal coliform

- **Phosphorus**

MILL BROOK

SALISBURY POND

BLACKSTONE RIVER



Six Minimum Control Measures







The MS4 Permit requires Permittees to meet specific requirements under the six minimum control measures:

- 1** Public Education and Outreach
- 2** Public Participation
- 3** Illicit Discharge Detection and Elimination
- 4** Management of Construction Site Runoff
- 5** Management of Post-Construction Site Runoff
- 6** Good Housekeeping in Municipal Operations

QCC Stormwater Management Program: Year 4 Highlights

Focused on writing & adopting new procedures to keep stormwater clean!

Submitted Year 4 Annual Report

-  QCC + Worcester + EPA coordination, phosphorus impairment impact **Impaired Waters**
-  Public meeting held virtually in Spring 2022 **MCM 2**
-  Completed written IDDE Program + Annual Training **MCM 3**
-  Completed written Operations & Maintenance (O&M) Program detailing activities for parks/open space, buildings/facilities, vehicles/equipment **MCM 6**
-  Completed written Stormwater Pollution Prevention Plan (SWPPP) + inspections **MCM 6**
-  Completed catch basin and stormwater maintenance inspections **MCM 6**

Public Education and Outreach

Provide educational material about stormwater to four audiences:

Visitors

Faculty/Staff

Students

Contractors



Provide the targeted audience information about stormwater and how their actions may impact it

2 messages for each audience during the five-year permit term



Public Education and Outreach

Flier distributed April 2021

Clean water begins with you.
Let's Think Blue.



Credit: Indian Lake Watershed Association



Polluted runoff threatens the health of Massachusetts water. You can do your part at home, at work, at play and at QCC to help keep our lakes and streams clear of pollution after rain and snow melt.

DID YOU KNOW?

Quinsigamond Community College is in the Blackstone River Watershed. Stormwater runoff from campus can carry harmful pollutants to nearby water bodies. Everyone can be a part of the solution!

Learn more about QCC Stormwater Management at www.qcc.edu/stormwater



Scoop it! Pet waste is gross and can make you sick. Bag and dispose of solid pet waste at Pet Waste Stations or trash cans.

Close it! Rain water running off trash cans sends waste into nearby streams. Close your trash can lids, cover dumpsters, and properly dispose of trash to keep pollution locked away.



Stop it! Stormwater pollution often begins at construction sites, but it doesn't have to. Take steps on your job site to prevent dirt from washing into nearby streams, roads and storm drains.

Catch it! Industries and businesses can keep oil, gas, and grease from washing into streams. Use drip pans to catch fluids. Keep absorbent materials close by to clean up small spills. Fix leaks and clean up spills quickly.



Learn more at www.ThinkBlueMassachusetts.org

1 Public Education and Outreach

Stormwater management is included as a topic in QCC class curricula and/or worked into a class field or research-related assignment. These classes include:

- SCI 104 – Climate and Weather: Causes and Effects (Fall/Spring/Summer)
- SCI 110 – Sustaining Earth's Environment (Fall/Spring)



Photo credit: Indian Lake Watershed Association, Inc.

1 Public Education and Outreach

QCC Stormwater Management website updates:

- Annual Reports & links to public meetings
- Systems maps & policies

QUINSIGAMOND Community College APPLY Register Today! SEARCH Menu

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- Locations**
- Worcester
- Marlborough
- Southbridge
- All Locations

Stormwater Management at QCC



Stormwater is a pollution problem that affects everyone in Massachusetts, but if we all do our part to help, we can reach our goal of clean and healthy waterways. Any excess rain, snow or ice melt that does not infiltrate into soil is called runoff. In urban areas, containing mostly asphalt, concrete and other impervious surfaces, stormwater runoff can carry pollutants such as salts, oils, grease, and debris. Stormwater runoff often makes its way through a series of storm sewers before discharging to surface waters, such as lakes or rivers. Excess pollutants in surface water can affect the health of plants and wildlife because this stormwater often goes untreated. The best solutions are to prevent pollutants from entering the storm sewer system and directing stormwater to "green" areas designed with plants and soils designed to soak up and treat runoff. Quinsigamond Community College is dedicated to contributing to cleaner water and a healthier environment.

In 1990, the U.S. Environmental Protection Agency (EPA) published rules for Phase I of the National Pollutant Discharge Elimination System (NPDES) stormwater program. The Phase I program required municipalities with populations of 100,000 or greater to implement a stormwater management program to control discharges from the "Municipal Separate Storm Sewer System" (MS4). An MS4 is a conveyance or system of conveyances that is:

- owned by a state, city, town, village, or other public entity that discharges to waters of the U.S.,
- designed or used to collect or convey stormwater (e.g., storm drains, pipes, ditches).

Public Meetings

- April 29, 2021 - Zoom Meeting

MS4 Permit and Documentation

- Year 2 Public Participation Meeting Presentation
- Notice of Intent
- Year 2 System Map
- Stormwater Management Program
- Stormwater Policy

Annual Reports

- Year 3 Annual Report
- Year 2 Annual Report
- Year 1 Annual Report

[Think Blue Massachusetts](#)

For more information contact Stephen Zisk at szisk@qcc.mass.edu or 508.854.4424

Visit: <https://www.qcc.edu/stormwater>

2

Public Participation

Permittees are required to at least annually **provide an opportunity for the public to participate in the development/ implementation of their Stormwater Management Program (SWMP).**

Notices must comply with state public notice requirements.



3

Illicit Discharge Detection and Elimination

Illicit Discharge = Any discharge to an MS4 that is not comprised entirely of stormwater is an illicit discharge (ID).

IDs can be caused by a variety of sources:

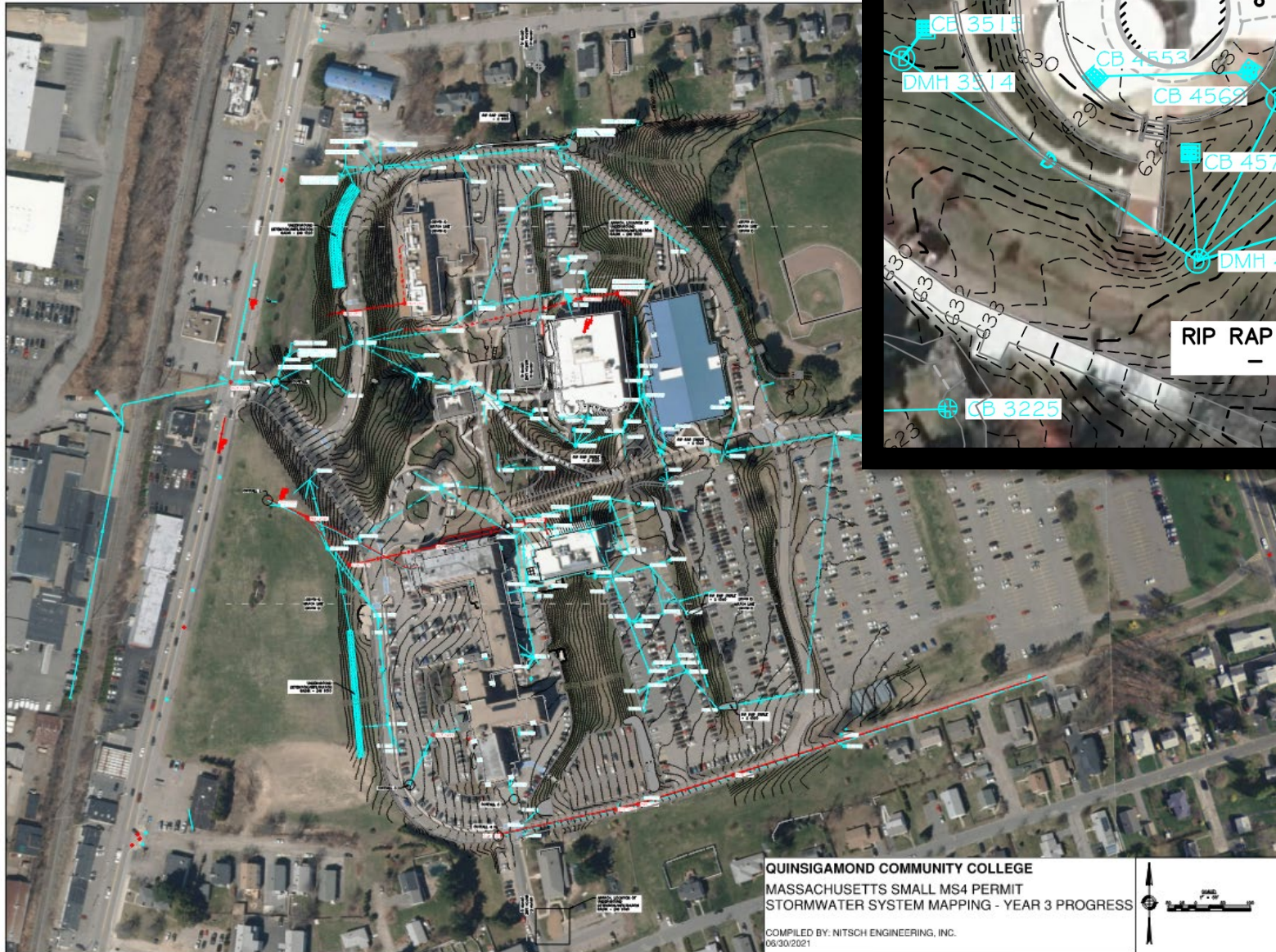
- Leaking sanitary sewers or water mains;
- Illegal sewage connections;
- Illegal floor drain connections;
- Seasonal draining of swimming pools; breakout from failing septic systems; and
- Spills and dumping.



3 Illicit Discharge Detection and Elimination

Permittees are required to proactively and systematically **find and eliminate sources of non-stormwater from their storm sewer system.**

Part of this requirement includes development of **system wide storm sewer system map.**



3

IDDE: QCC Mapping

The mapping was updated to include stormwater best management practices (BMPs), including:

- Swales
- Stormwater Ponds
- Constructed Wetlands
- Bioretention Areas
- Stormwater Treatment Structures



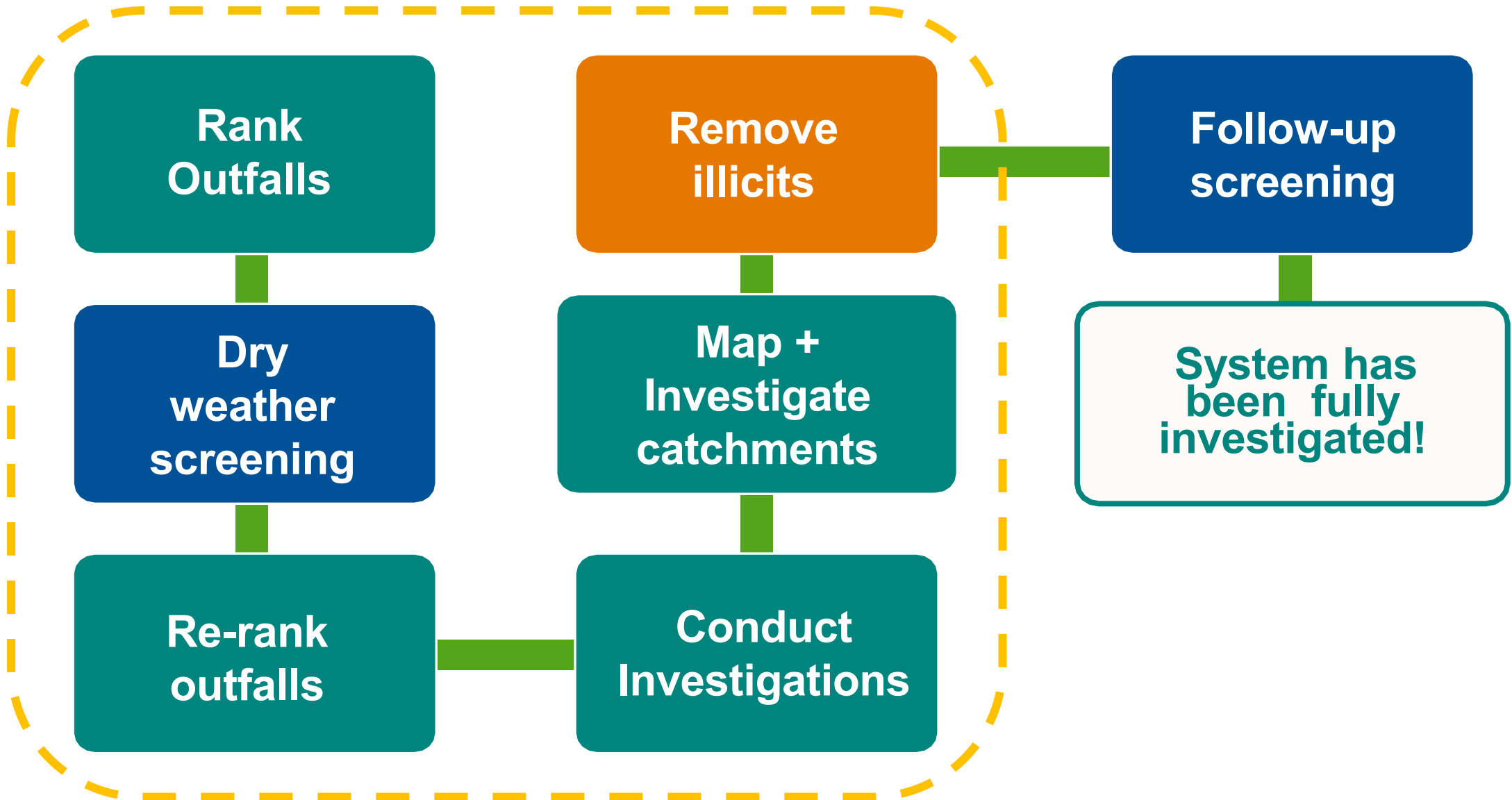
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Illicit Discharge Detection and Elimination

<p>Legal Authority (2.3.4.a and 2.3.4.6.a)</p>	<p>An ordinance, bylaw or other regulatory mechanism which provides the MS4 operator the legal authority to: prohibit IDs, investigate suspected IDs, eliminate IDs, and enforce the IDDE program (already required under the 2003 Small MS4 Permit).</p>	<p>Catchment Investigations (2.3.4.8)</p>	<p>Requires a written systematic procedure to investigate each catchment with an outfall within 18 months of the permit effective date. Also must identify maps, historic plans, and records; include a manhole inspection methodology; and establish procedures to isolate, confirm, and remove sources of IDs.</p>
<p>Protocol & Responsibilities (2.3.4.6.c)</p>	<p>Identifies who is responsible for eliminating known IDs or other problems.</p> <p>Establishes protocols to: eliminate illicit connections or other problems, document and verify the removal of IDs and track progress towards overall program goals.</p>	<p>Indicators of IDDE Program Progress (2.3.4.9)</p>	<p>Describes the indicators to be used to track progress of the program and gauge its success.</p>
<p>Assessment and Priority Ranking of Outfalls (2.3.4.7)</p>	<p>Assesses the ID and SSO potential of all outfalls and priority rank them as problem, high priority, low priority, or excluded based on a number of criteria.</p>	<p>Ongoing Screening (2.3.4.10)</p>	<p>Consists of dry weather screening and sampling and wet weather screening and sampling once every five years upon completion of all catchment investigations.</p>
		<p>Employee Training (2.3.4.11)</p>	<p>Creates a program of training on how to recognize IDs and SSOs. Training frequency and type must be documented in the annual report.</p>

3

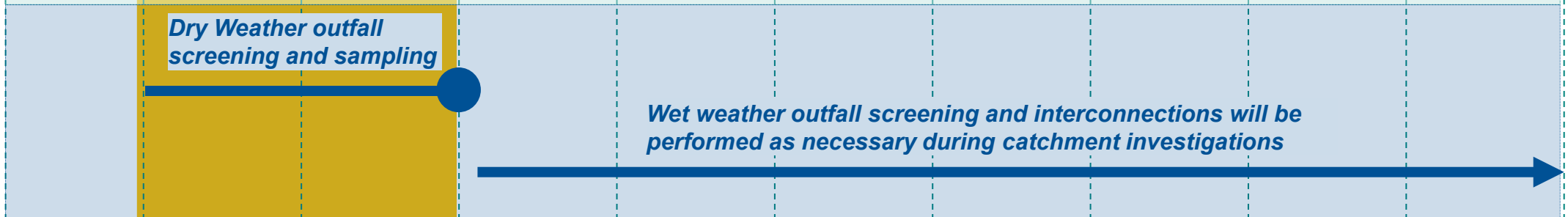
Illicit Discharge Detection and Elimination



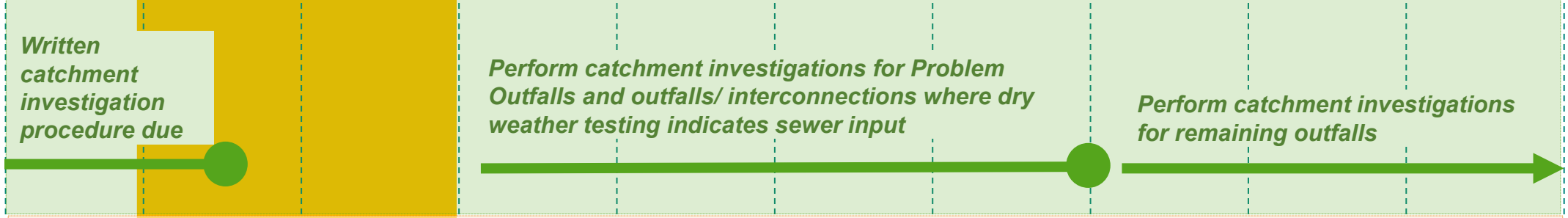
Mapping



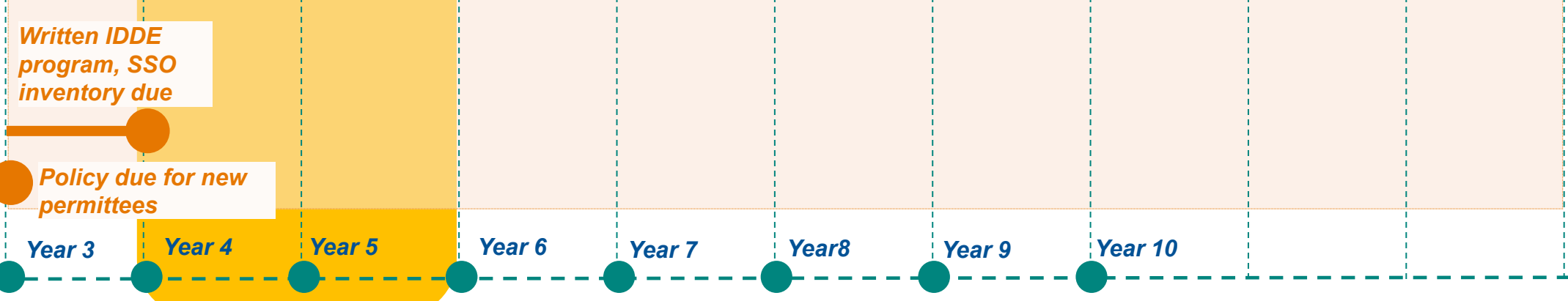
Outfall Screening



Catchment Work



Written Programs



4 Management of Construction Site Runoff

Permittees are required to have an **ordinance from management of stormwater discharges from construction sites** that disturb one or more acres of land.

Requirements

- Policy
- Site Inspection Procedures
- Sediment Control Requirements
- Requirements To Control Waste
- Site Plan Review



4 Management of Construction Site Runoff

New Policies:

- Construction Site Inspection
- Erosion & Sedimentation Control

CONSTRUCTION SITE INSPECTION

Construction sites that lack adequate stormwater controls can contribute sediment to nearby bodies of water. This Standard Operating Procedure describes components of Quinsigamond Community College's Stormwater Construction Site Inspection procedures for evaluating compliance of stormwater controls at construction sites.

1. *Stormwater Construction Inspection Plan*

A stormwater Construction Site Inspection program is a program developed to monitor and enforce local stormwater requirements at construction sites.

This SOP assumes that Quinsigamond Community College (QCC) has a legal ordinance in place, per the requirements of the 2016 Massachusetts MS4 and erosion control at construction sites. This legal authority must require "to implement a sediment and erosion control program which includes Best Management Practices (BMPs) that are appropriate for the conditions at the construction site, including effective measures to minimize the land disturbance." The legal authority must also give inspectors the authority to enforce these requirements.

Quinsigamond Community College stormwater Construction Site Inspection procedures address the following:

1. Construction Site Inventory
 - A tracking system to inventory projects and identify sites for inspection.
 - Track the results of inspection and prioritize sites based on proximity to waterways, size, slope, and history of past violations.
2. Construction Requirements and BMPs
 - QCC provides contractors with guidance on the appropriate stormwater BMPs.
3. Plan Review Procedures
 - Submitted plans must be reviewed to ensure they address requirements to protect water quality.
4. Public Input
 - Per the 2016 Massachusetts MS4 Permit, a program must provide for public comment on inspection procedures and must consider input from the public.
5. Construction Site Inspections
 - Identify an inspection frequency for each site.
 - See more detailed information below.
6. Enforcement Procedures
 - A written progressive enforcement policy for the inspector.

EROSION AND SEDIMENTATION CONTROL

Erosion and sedimentation from land-disturbing human activities can be a significant source of stormwater pollution. This Standard Operating Procedure describes methods for reducing or eliminating pollutant loading from such activities.

1. *Controlling Erosion and Sediment through Design and Planning*

Prevention of erosion and sedimentation is preferable to installing treatment devices. Consistent application and implementation of the following guidelines during the design and review phases can prevent erosion and sedimentation:

1. Avoid sensitive areas, steep slopes, and highly erodible soils to the maximum extent possible when developing site plans.
2. Identify potential problem areas before the site plan is finalized and approved.
3. Plan to use sediment barriers along contour lines, with a focus on areas where short-circuiting (i.e., flow around the barrier) may occur.
4. Use berms at the top of a steep slope to divert runoff away from the slope's edge.
5. Design trapezoidal or parabolic vegetated drainage channels, not triangular.
6. Use vegetated channels with rip rap check dams, instead of impervious pavement or concrete, to reduce the water velocity of the conveyance system.
7. Design a check dam or sediment forebay with level spreader at the exit of outfalls to reduce water velocity of the discharge and collect sediment.
8. Use turf reinforcement matting to stabilize vegetated channels, encourage vegetation establishment, and withstand flow velocities without scouring the base of the channel.
9. Plan open channels to follow land contours so natural drainage is not disrupted.
10. Use organic matting for temporary slope stabilization and synthetic matting for permanent stabilization.
11. Provide a stable channel, flume, or slope drain where it is necessary to carry water down slopes.

2. *Controlling Erosion and Sediment on Construction Sites*

During the construction phase, it is important to inspect active sites regularly to ensure that practices are consistent with approved site plans and the site's Stormwater Pollution Prevention Plan (SWPPP) or other document, as required by Quinsigamond Community College's legal authority. The following guidelines apply:

1. Erosion and sediment control features should be constructed before initiating activities that remove vegetated cover or otherwise disturb the site. These shall be installed consistent with the approved site plans and with manufacturer's instructions.
2. Erosion and sediment control devices shall be inspected by the contractor regularly and maintained as needed to ensure function.

5 Management of Post Construction Site Runoff (New Development and Redevelopment)

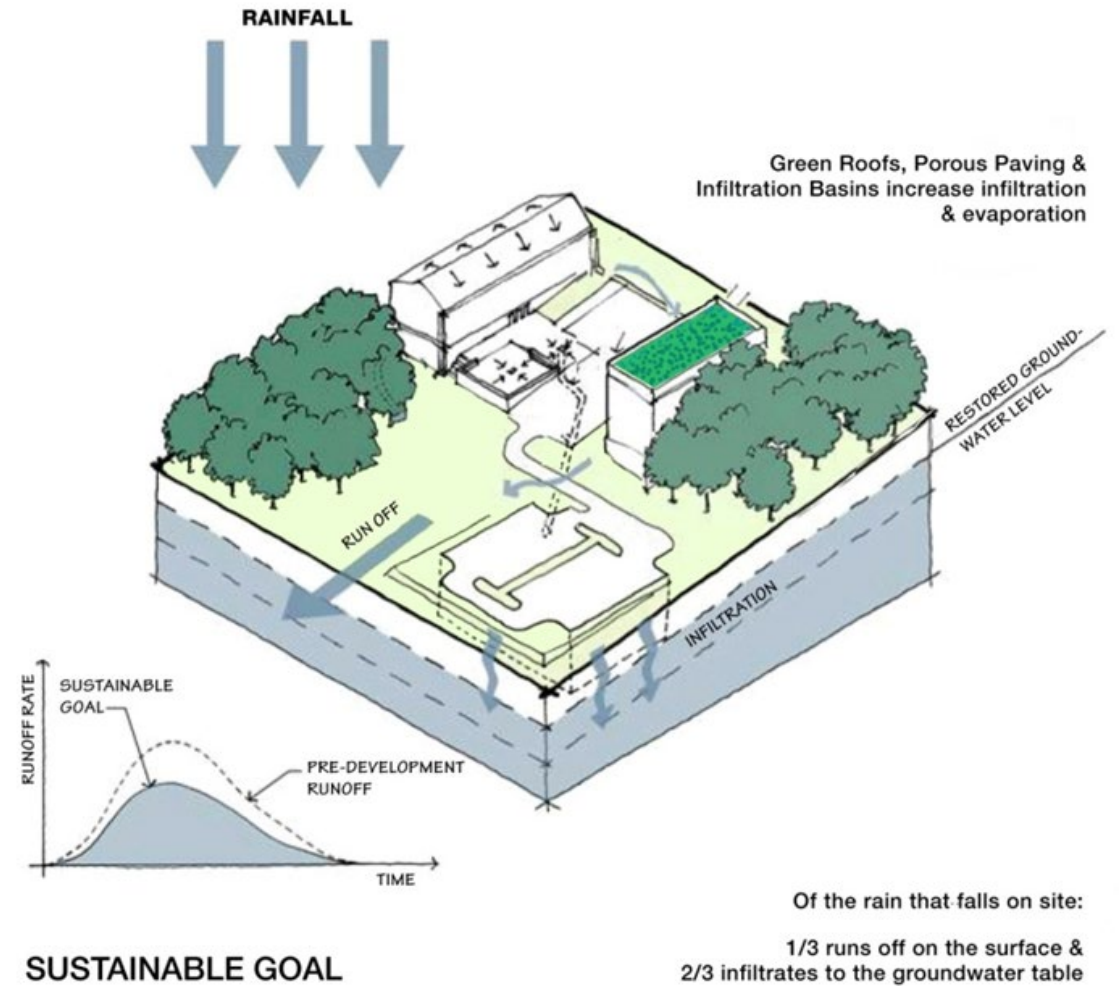
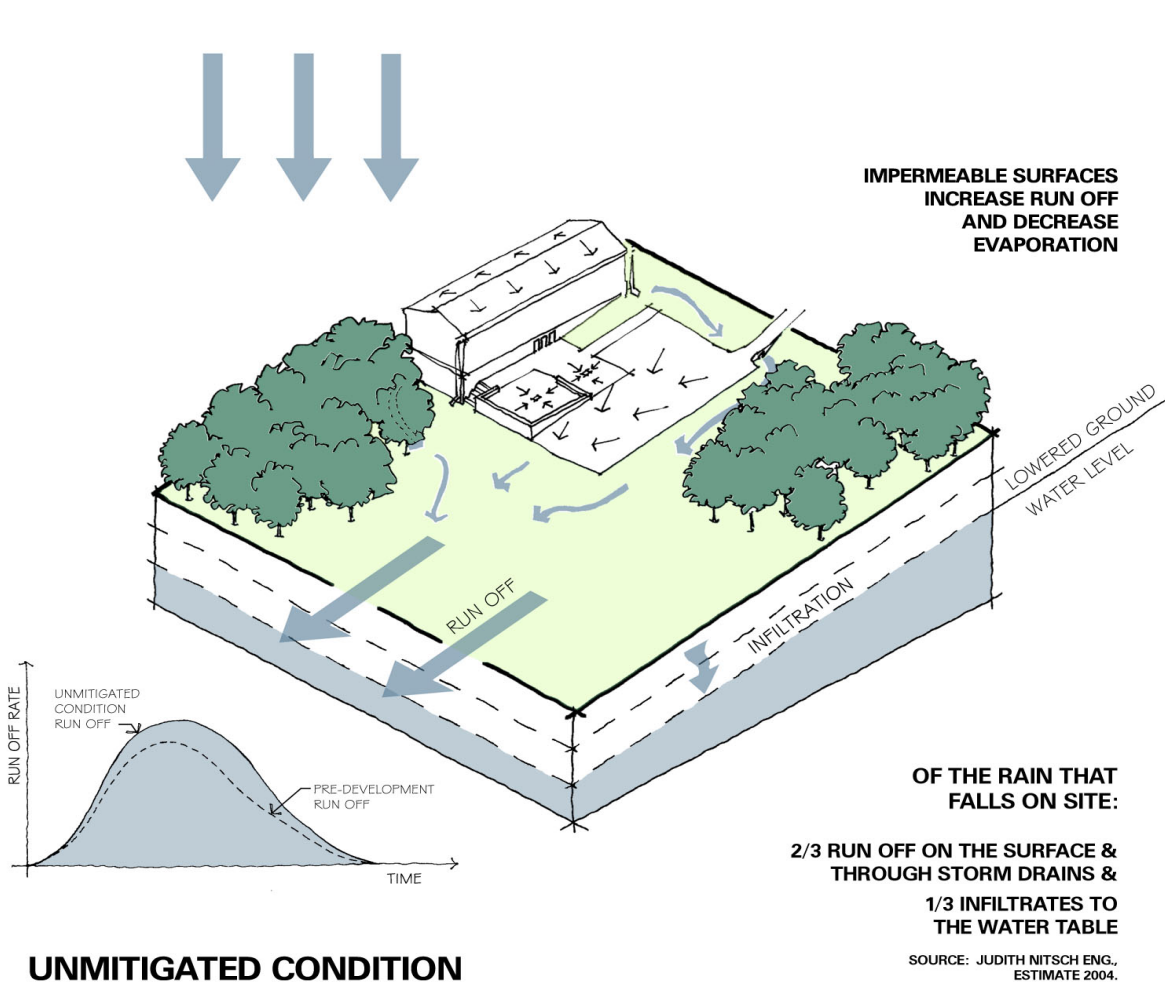
Permittees are required to address stormwater runoff from new development and redevelopment that disturb one or more acres of land.

This control measure encourages the use of low impact design techniques and requires the retention or treatment of runoff on site using green infrastructure practices.



5

Management of Post Construction Site Runoff



5

Management of Post Construction Site Runoff (New Development and Redevelopment)

NEW DEVELOPMENT

- Comply with Massachusetts Stormwater Standards 1, 2, 3, 5, 6 and 9
- **Fully retain the first 1 inch of runoff from impervious area onsite OR design treatment such that 90% of the average annual load of total suspended solids (TSS) and 60% of the average annual load of total phosphorus generated from the impervious area on the site is removed prior to discharge**

REDEVELOPMENT

- Comply with Massachusetts Stormwater Standards 1, 2, 3, 5, 6 and 9 to the maximum extent feasible
- **Retain the first 0.8 inch of runoff from impervious area onsite OR design treatment such that 80% of the average annual load of total suspended solids (TSS) and 50% of the average annual load of total phosphorus generated from the impervious area on the site is removed prior to discharge**
- Offsite mitigation is allowed

6 Good Housekeeping in Municipal Operations

Permittees are required to implement **good housekeeping practices in campus operations** such as vehicle maintenance, open space, buildings and infrastructure.

Requirements

- O&M Procedures
- Catch Basin Cleaning
- Street Sweeping
- SWPPP



6 Good Housekeeping in Campus Operations

QCC has developed standard operating procedures for the following:



Catch Basin
Inspection and
Cleaning



Sweeping Streets and
Parking Lots



Snow and Ice Removal



Inspecting Constructed
Best Management
Practices (BMPs)

Additional Phosphorus Requirements

Yard Waste

In the spring, bag your grass clippings for curbside pickup. In the fall, do it again with your leaves. Even better, compost them to make a natural fertilizer for your garden. But whatever you do, don't dump them in a brook or storm drain, and don't leave them on the sidewalk!

Learn more from the [Mystic River Watershed Association](#).

Lawn Chemicals and Fertilizer

Test your soil and read the label before you apply fertilizer. If you use too much fertilizer, the excess will just wash away in the next rain, polluting your local waterways. Use fertilizers sparingly and sweep up driveways, sidewalks and walkways.

You may not even need to fertilize your yard! According to experts, most homeowners over-fertilize their lawns. The University of Massachusetts has a handy guide [on how to test your soil](#) to see if you need to fertilize.

Pet Waste Belongs in the Trash!

You hate stepping in it. And fish hate swimming in it, too! When you walk your dog, make sure to carry a plastic bag with you so that you can pick up the waste and dispose of it properly. Flushing is the best disposal method (don't flush the plastic bag), but you can also throw it in a trash can. Some towns will fine you if they catch you leaving it in public areas!

Do your "doody" in both public areas and in your yard. To learn more, visit the [Neponset River Watershed Association](#).





So, what can you do?



Review educational & informational stormwater notices send to QCC Students, Faculty, & Staff



Check out the QCC Stormwater Website



Continue to attend public outreach meetings and sign up for related courses



Report evidence of potential illicit discharges, spills, and illegal dumping – If you see something, please say something!



Be a good stormwater steward

Participate in clean-ups, manage pet waste, handle waste carefully, practice good car maintenance, and recycle or dispose of waste appropriately

Questions?



QUINSIGAMOND
Community College



Nitsch Engineering

