Leveraging Resources to Meet SWMI

New England Water Environment Association (NEWEA)
2015 Annual Conference

January 27, 2015

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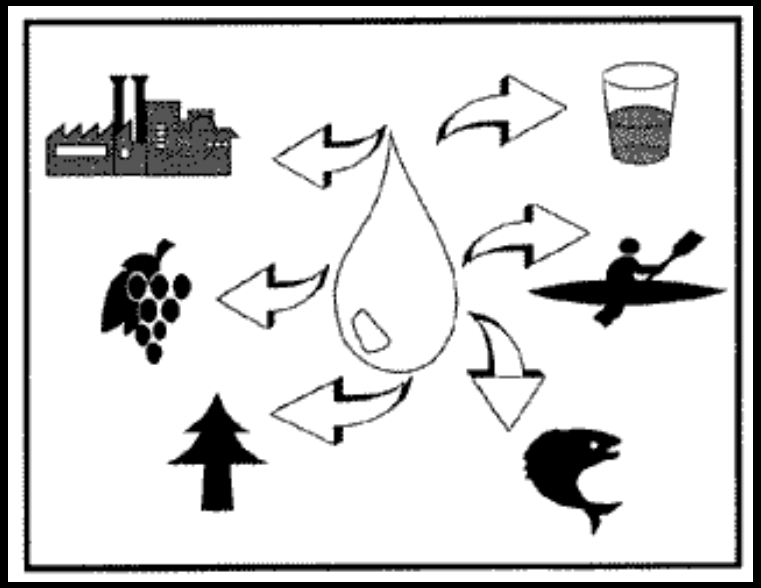
What is SWMI?

- Sustainable Water Management Initiative
  - Framework for permitting water supplies under the Water Management Act
    - Balance water needs for human & ecological use
    - Minimize existing withdrawal impacts
    - Mitigate new withdrawal impacts



Source: http://pubs.usgs.gov/of/1993/ofr93-642/

Regulations and Guidance Can be Found at:
http://www.mass.gov/eea/agencies/massdep/water/watersheds/water-management-act-program.html

When Does SWMI Apply?

River Basin Permitting Dates

Basins previously permitted to be adjusted at next 5-Year Review

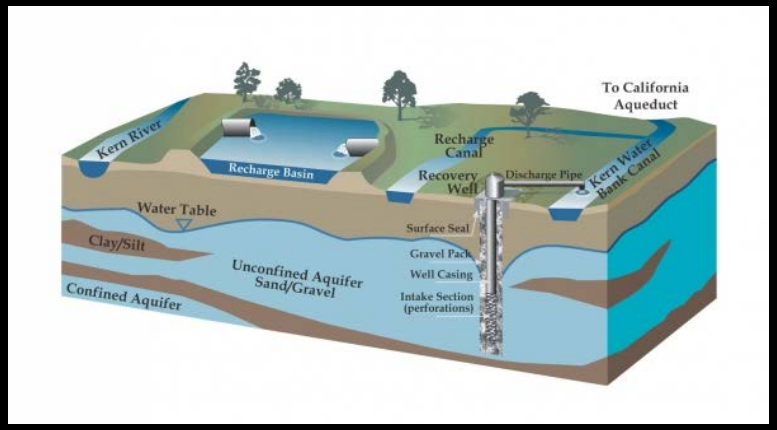
Water Source	Outreach Meeting	Projected 5-Year Review Issuance
Hudson	November 2017	August 2018
Blackstone	April 2016	February 2017
Charles	April 2016	February 2017
North Coastal	March 24, 2015	February 2016

* Basins with Permits on File

Water Source	Outreach Meeting	Permit Renewal Dates
South Coastal *	**October 30, 2014**	August 2015
Cape Cod*	**January 20, 2015**	November 2015
Ipswich*	**March 24, 2015**	January 2016
Boston Harbor* /Taunton*	**April 23, 2015**	February 2016
Islands *	May 2015	February 2016
Deerfield	February 10, 2015	February 2016
Housatonic	February 10, 2015	May 2016
Buzzards Bays	February 24, 2015	May 2016
Concord	May 2015	August 2016
Ten Mile	August 2015	August 2016
Westfield	August 2015	November 2016
Millers	November 2016	February 2017
Chicopee	February 2016	May 2017
Quinebaug	May 2016	August 2017
Connecticut	August 2016	November 2017
Nashua	November 2016	February 2018
French	February 2017	May 2018
Shawsheen	May 2017	August 2018
Merrimack	August 2017	November 2018
Parker	November 2017	February 2019
Narragansett	February 2018	May 2019

What Will My Requirements Be?

- Standard Permit Conditions: All permittees
- Minimization: Groundwater withdrawals in subbasins with ≥25% August Net Groundwater Depletion (NGD)
- Coldwater Fishery Resource (CFR) Protection
- Alternative Source Analysis: Groundwater withdrawal above baseline that causes a change in the biological category (BC) or groundwater withdrawal category (GWC) of a subbasin
- Mitigation: Withdrawal above baseline



http://www.kwb.org/index.cfm/fuseaction/Pages.Page/id/368

Minimization

- Desktop optimization: evaluate alternative system operations
- Water releases and returns: releases from surface water supply impoundments
- Additional conservation measures: measures beyond standard WMA water conservation requirements

Mitigation

Integrates Drinking Water, Wastewater & Stormwater

- The Volume to be Mitigated is Calculated as Follows:
  1. Determine volume request above baseline
  2. Subtract estimated demand management volumes
  3. Subtract future eligible wastewater returns
  4. Mitigate remaining volume through:
     - Direct/quantifiable measures
     - Indirect/non-quantifiable measures
- Document Proposed Mitigation in Mitigation Plan

Mitigation Volume = Request above baseline – demand management – future ww returns

Demand Management

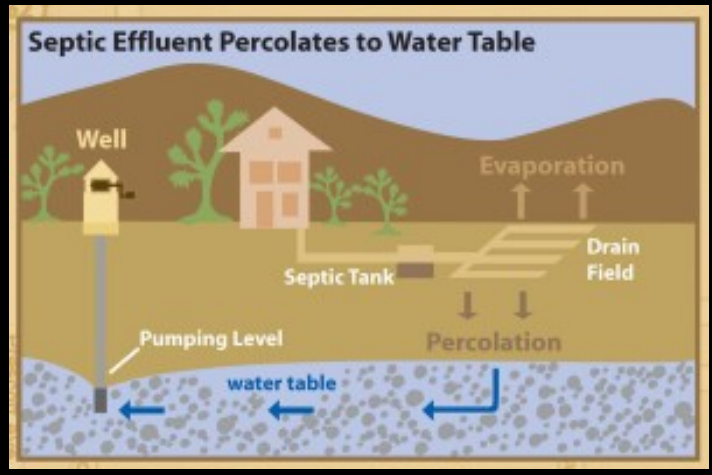
- Provide credible estimates for actions:
  - Outdoor Watering Restrictions
  - Water Conservation Devices/Appliances
  - Water conservation rates
  - Monthly billing/remote meters
  - Conservation education/outreach
  - Water bank
  - Water supply enterprise account

Source: https://sites.google.com/site/greencondocoop/climate-change---local-response

- Monitor Success of Plan Over Time (i.e., ASRs & 5-year permit reviews) & Adjust Mitigation Plan as needed

Wastewater Adjustment

- Applicable to Future Returns
  - Septic systems: assumes 85% of water use is returned to the ground water (15% consumptive loss)
  - Regulated groundwater discharges



Source: http://capefearplumber.com/services/septic-services-in-wilmington-nc-and-oak-island/

- Location Adjustment Factor (LAF) Applies
  - 100% credit for returns within the major basin
  - 50% credit for returns outside the major basin
  - Also applies to direct mitigation
  - Returns outside major basin may receive an additional 25% credit if to a more depleted subbasin

Wastewater Adjustment Example

- A Town is requesting 0.1 mgd withdrawal above baseline & 100% of the Town is served by septic systems. What is the wastewater adjustment if the wastewater flows are returned to the same major basin as the withdrawal?

Wastewater adjustment = 0.1 mgd x 85% x 100% = 0.085 mgd

- What if wastewater flows are returned to a different major basin?

Wastewater adjustment = 0.1 mgd x 85% x 50% = 0.0425 mgd

Mitigation

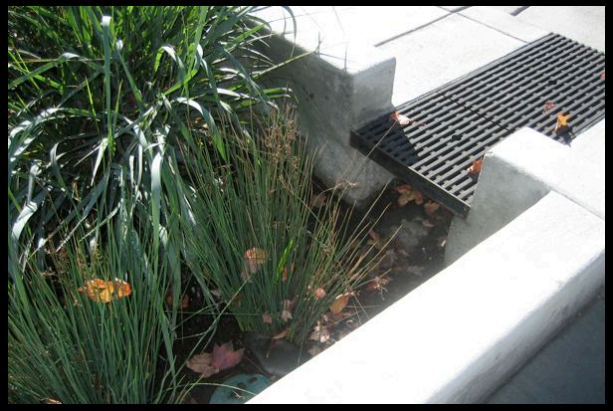
- After All Adjustments Have Been Made…
  - Mitigate remaining volume through:
    - Direct mitigation – quantifiable measures
    - Indirect mitigation – non-quantifiable measures
- Post-2005 Activities Can Be Counted
- Integrates Drinking Water, Wastewater & Stormwater

Mitigation Volume = Request above baseline – demand management – future ww returns

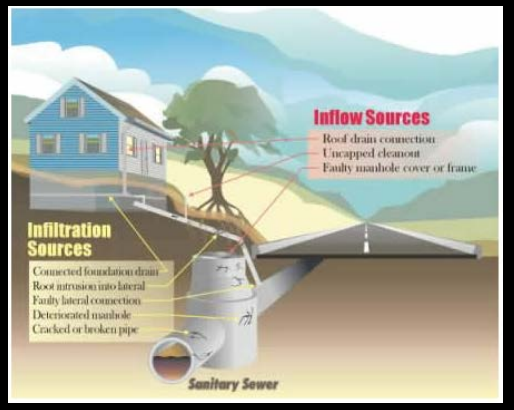
Direct Mitigation

- Surface Water Releases
- Stormwater Recharge
- Infiltration and Inflow (I/I) Removal

Source: http://commons.wikimedia.org/wiki/File:Lower_Hunt's_Pond_Dam,_East_Douglas_MA.jpg



Source: http://www.madrono.org/san-francisco-landscape/water/stormwater/stormwater-infiltration-sidewalk-planters.html#.VK_9xyvF-no



Source: http://www.3riverswetweather.org/about-wet-weather-issue/understanding-sewer-collection-system/inflow-infiltration-overflow

Direct Mitigation: Surface Water Releases

- Supplement Downstream Flow Conditions Through Controlled Releases From Impoundment
- Release Schedule and Volume of Credit Determined on a Case-By-Case Basis
- Coordination with Town Officials:
  - Are there dams in the community?
  - Who owns and maintains these?

Source: http://commons.wikimedia.org/wiki/File:Lower_Hunt's_Pond_Dam,_East_Douglas_MA.jpg

Direct Mitigation: Stormwater Recharge

- Infiltrate Stormwater Runoff From Areas of Directly Connected Impervious Area (DCIA)
  - Replace impervious surfaces with vegetation, porous asphalt or porous pavers
  - Redirecting runoff to infiltration
  - Increases in annual recharge from redevelopment
- O&M Plans required

Stormwater Recharge Examples

Source: http://www.pavingexpert.com/permabl1.html

Porous Surfaces

Stormwater Recharge Examples

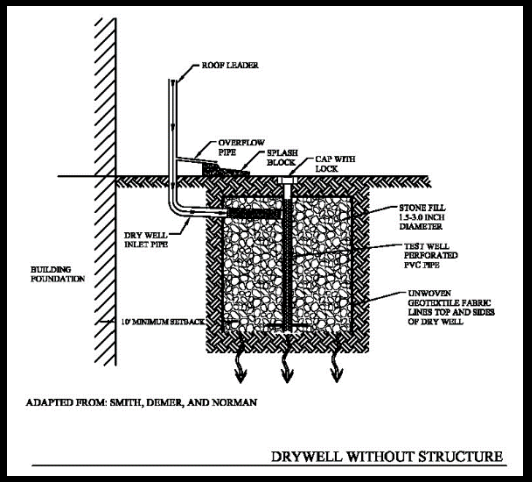
Infiltrating Swale

Raingarden/Biofilter

Infiltration Basin

Source: http://www.stormwaterpartners.com/facilities/basin.html

Stormwater Recharge Examples



Leaching Catch Basins/Roof Leader Dry Wells

Underground Infiltration

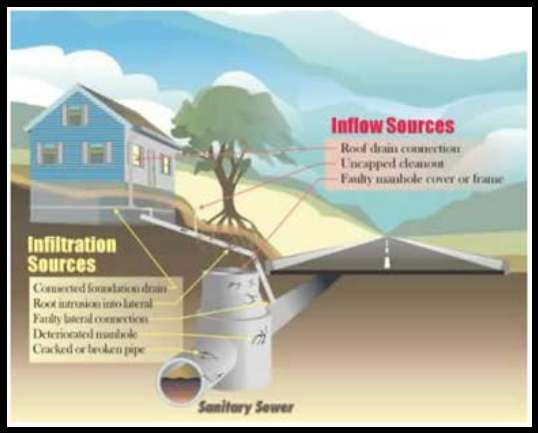
Direct Mitigation: Stormwater Recharge

- Coordination with Department of Public Works
  - Is our community regulated under the NPDES Phase II Small MS4 Program?
  - Have we installed any structural stormwater Best Management Practices (BMPs) that infiltrate since 2005?
  - Are their plans to install infiltration BMPs?

- Coordination with the Planning Department
  - Have there been any redevelopment projects since 2005 where more infiltration from DCIAs was required?
  - Do our regulations require redevelopment projects to infiltrate stormwater runoff?

Direct Mitigation: Infiltration & Inflow (I/I) Removal

- Infiltration
  - Typically maximum of 50% Infiltration Removal
  - Provide:
    - Basis of infiltration rates
    - Infiltration removal projects
- Inflow
  - 100% credit for flows redirected to recharge
  - Provide:
    - Basis of inflow rates
    - Inflow removal projects



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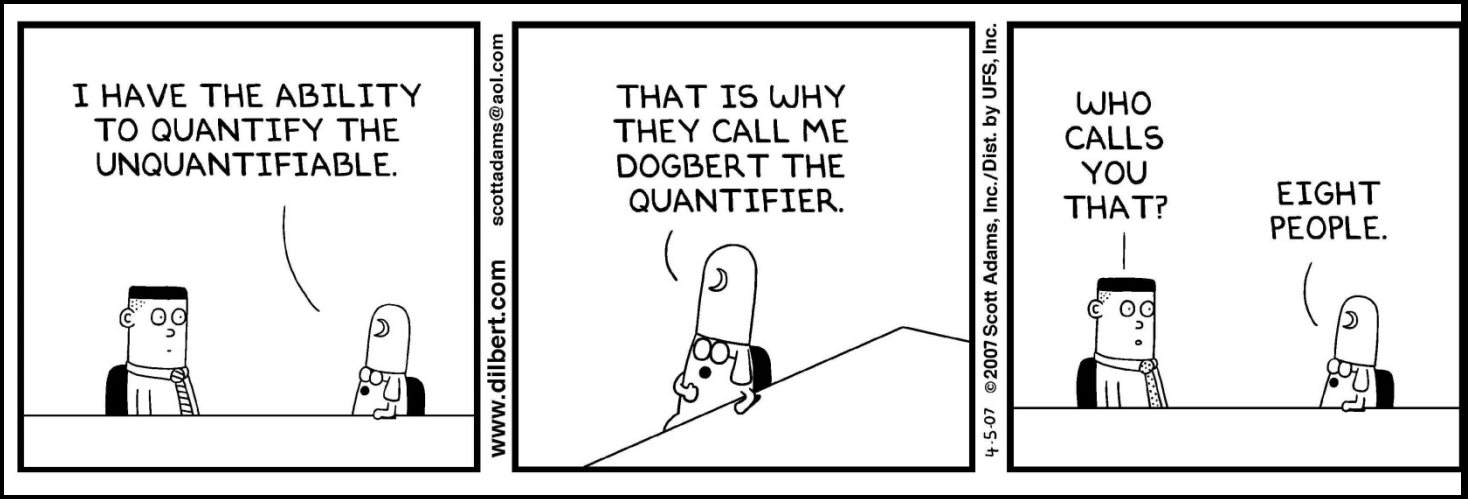
Direct Mitigation: Infiltration & Inflow (I/I) Removal

- Coordination with Wastewater Department
  - Do we have an I/I Program?
  - Do we have records of infiltration removal since 2005?
  - Do we have records of inflow removal that was directed to recharge since 2005?
  - Are there plans for future I/I programs?

Indirect Mitigation

- Used After Direct Mitigation Options Are Exhausted
- Activities Not Amenable to Volumetric Calculation
- Qualitative Credit System



DILBERT: © Scott Adams/Dist. by United Feature Syndicate, Inc.

Source: http://www.theimprovegroup.com/weblog/musings_from_leahs_desk/

Credits Required for Indirect Mitigation		
Indirect Mitigation Amount (MGD)	**Credits required for Tier 2**	**Credits required for Tier 3**
> 0 to 0.1	Up to 10	Up to 20
>0.1 to 0.2	Up to 20	Up to 40
>0.2 to 0.3	Up to 30	Up to 60
>0.3 to 0.4	Up to 40	Up to 80
>0.4 to 0.5	Up to 50	Up to 100
>0.5 to 0.6	Up to 60	Up to 120
>0.6 to 0.7	Up to 70	Up to 140
>0.7 to 0.8	Up to 80	Up to 160
>0.8 to 0.9	Up to 90	Up to 180
>0.9 to 1	Up to 100	Up to 200
1.0 or more	case by case	case by case

Category	Mitigation Action	Generic Total Score
Habitat Improvement	Remove a dam or other flow barrier	25
Habitat Improvement	Culvert replacement to meet stream crossing standards	20
Habitat Improvement	Streambank restoration	15
Habitat Improvement	Stream channel restoration	15
Habitat Improvement	Stream buffer restoration	15
Habitat Improvement	Other habitat restoration project	10
Habitat Improvement	Install and maintain a fish ladder	10
Habitat Protection	Acquire property in Zone I or II	10
Stormwater	Stormwater bylaw with recharge requirements	10
Stormwater	Stormwater utility meeting environmental requirement	10
Stormwater	Implement MS4 requirements	10
Habitat Improvement	Establish/contribute to aquatic habitat restoration fund	5
Habitat Protection	Acquire property for other natural resource protection	5
Wastewater	Infiltration/inflow removal program	5
Optimization	Surcharged Reach	10
Demand Controls	Private Well Bylaw	10
TBD	Other project proposed by applicant	TBD

Questions for Town Staff to Review Together: Habitat Improvement & Protection

- Have any dams been removed within the Town since 2005 and/or are there plans to do so?
- Do we have a culvert repair/replacement program? Does it incorporate stream crossing standards for habitat? Have any repairs/replacements been completed since 2005?
- Have there been any streambank, stream channel, or stream buffer improvements in Town?
- Have there been any other habitat restoration projects in Town?

Questions for Town Staff to Review Together: Habitat Improvement & Protection

- Have any fish ladders been installed in Town since 2005 and/or are there plans to do so?
- Have we acquired property in the water supply Zone I or II since 2005 and/or are there plans to do so?
- Have we acquired property for natural resource protection since 2005 and/or are there plans to do so?
- Do we have or contribute to an aquatic habitat restoration fund?

Questions for Town Staff to Review Together: Stormwater & Demand Controls

Stormwater

- Do we have a stormwater bylaw? Does it require recharge from new and redevelopment properties?
- Do we have or are we considering a stormwater utility? Does/will it require/promote recharge?
- Are we regulated under the NPDES Phase II Small MS4 Program? Does program implementation result in increased recharge?

Demand Controls

- Do we have a bylaw that regulated withdrawals from private wells?

SWMI Preparation Summary

- Determine When Your Permit is Up for Renewal;
- Develop an Action Plan & Schedule for Preparing Documentation for Your Next Renewal Application;
- Estimate Your Baseline, Withdrawals and Mitigation Requirements;
- Assess & Document Existing Water Conservation Efforts
- Understand How Wastewater & Stormwater are Handled Within Your Community, & Whether & Where These Infrastructure Systems Recharge Water to Groundwater;

SWMI Preparation Summary

- Understand How Dams are Managed in Your Community, & Who Owns & Maintains Them;
- Understand Culvert Crossings in Your Community, Including Scheduled Repairs/Replacements & Potential Habitat Improvements;
- Coordination Will Be Essential Among Town Departments Such as Planning, Engineering, DPWs, & Conservation Departments. Successful Compliance Will Require These Department to Work Closely;
- Apply for a SWMI Grant to Help Identify or Implement Mitigation Projects.

Questions?

Contact Information

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