South Coastal Basin

20-Year Renewal Permit Meeting

October 30, 2014
Kingston Town House

MA Executive Office of Energy and Environmental Affairs
Department of Conservation and Recreation
Department of Environmental Protection
Department of Fish and Game

South Coastal Outreach Meeting

Agenda

- Introductions
- WMA Permit Process
- South Coastal Specifics
- Questions & Answers
- Informal Agency Consultations

Meeting Purpose- Part One

- Explain the WMA permit renewal process, including:
  - WMA Purpose
  - Permit Renewal Schedule
  - Water Needs Forecasts
  - Safe Yield
  - Permit Conditions
  - New Permit Requirements

Meeting Purpose- Part Two

- Review South Coastal data and requirements, including:
  - Water Use
  - Baselines
  - Water Use Restrictions
  - Coldwater Fisheries Resources (CFRs) and Requirements
  - Minimization Requirements
  - Mitigation Requirements

Water Management Act Purpose

Chapter 21G, Section 7 Reasonable protection of …

- Public drinking water supplies
- Navigation
- Hydropower resources
- Fish and wildlife
- Water quality
- Water-based recreation
- Wastewater treatment capacity
- Agriculture
- Waste assimilation capacity
- Reasonable conservation practices consistent with efficient utilization of water
- Groundwater recharge areas
- Flood plains
- Wetland habitat
- Reasonable economic development and creation of jobs

South Coastal Permit Renewal Schedule

Timeline	Activity	Notes
June – Sept 2014	Draft new Water Needs Forecasts (WNF) where applicable	DCR in consultation with PWS
Oct and Nov 2014	Outreach meeting and final WNF	
Oct 2014– April 2015	Consultation meetings	As necessary
Jan 2015	DEP restarts permit application and issues Order to Compete (OTC) where necessary	
Jan – April 2015	Applicant prepares response to OTC	
April 2015	OTC response due back	
May – June 2015	DEP reviews	Mtgs. as necessary
July 2015	Draft permit issued and public comment period	
Aug 2015	Issue final permit	

Safe Yield

55% of Annual Drought Basin Yield + Reservoir Storage

- New methodology determines maximum withdrawal volumes on annual basis and major basin scale.
- South Coastal Basin safe yield calculated with multiple methods*

*For more detailed description, see Appendix B of the SWMI Guidance documents

Basin	Safe Yield	Total Annual Authorized Withdrawals	Total Annualized Registered Volume	2012 Reported Use
South Coastal	73.3 mgd	48.3 mgd	36.68 mgd	39.9 mgd

Water Needs Forecasts (WNF)

- Applications for WMA Permits require a forecast of water needs for the permit term
- DCR develops forecast
- WRC Method:
  - Population and Employment forecasts
  - 65/10 and Current Trends scenarios
  - + 5% Buffer
  - At least 3 years of reliable data
  - Temporary allocation where necessary

- URL: www.mass.gov/eea/wnf-method

Steps in Developing a Water Needs Forecast

- DCR complies and analyzes data
- Public Notices: *Environmental Monitor*; status report to WRC
- DCR develops draft forecast; discussions with water supplier
- Basin-wide public meeting (this meeting)
- PWS includes forecast in WMA permit application

General Timeframe: 2 months-
All complete in this basin

Data from Water Supplier

1. Water-use data based on actual metering for 3 to 5 years (from ASRs):
   - Residential
   - Industrial, Commercial, Municipal (Nonresidential)
   - Treatment plant losses (if any)
   - UAW
2. Population served by water system (including out of town and seasonal)
3. Anticipated significant changes in water use (large projects not captured in projections)

Data Obtained by DCR

Data	Sources
Current Town-wide Population	U.S. Census, Planning Office
Population Projections	Regional Planning Agency
Current Employment	Regional Planning Agency
Employment Projections	Regional Planning Agency

WMA Permit Conditions

1. Efficiency Requirements
   - 65 residential gallons per capita day (RGPCD)
   - 10% unaccounted-for-water (UAW)
   - BMPs (leak detection & repair, metering, pricing, public education etc.)
2. Seasonal limits on nonessential outdoor water use

Nonessential Outdoor Water Use Restrictions

Non-Essential: Uses not required for health or safety reasons, by regulation, for production of food or fiber, for maintenance of livestock, or to meet the core function of a business

RGPCD for prior year	Calendar		STREAMFLOW		
	May 1 to Sept 30	7 day Low-Flow Trigger	Flow above ABF	Flow below ABF	7 day Low-Flow Trigger
< 65 →	7 days *	1 day *	7 days	7 days*	1 day*
>65 →	2 days *	1 day*	7 days	2 days*	1 day*

* No watering 9 am to 5 pm on any day

ABF= Aquatic Base Flow
7 Day Low Flow calculated from period of record flows from a local USGS stream gage

Surface water PWSs with a Summer Management Plan with environmental considerations approved by DEP may vary from above requirements

Cranberry Standard Conditions

NRCS Certified Conservation Farm Plan required

- Implement BMPs in accordance with UMASS Cranberry Experiment Station as applicable. BMPs include:
  - Nutrient Management
  - Sprinkler System Design & Use
  - Water Control Structures
  - Water Resource Protection and Enhancement

http://www.umass.edu/cranberry/pubs/bmps.html

Golf Standard Conditions

All permitted golf courses will be required to:

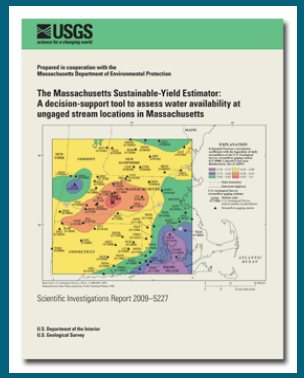
- have a conservation program that includes
  - metering,
  - irrigation system maintenance,
  - turf management, and
  - education;
- limit nonessential irrigation during drought;
- optimize withdrawals to protect cold water fisheries; and
- minimize impacts if the golf course is in a groundwater depleted subbasin.

New or expanding golf courses may also be required to:

- mitigate irrigation impacts; and
- show that there is no alternative source that is less environmentally harmful.

Science and Policy Informing WMA Permit Requirements

- USGS Studies: August withdrawals and impervious cover have significant impact on fluvial fish



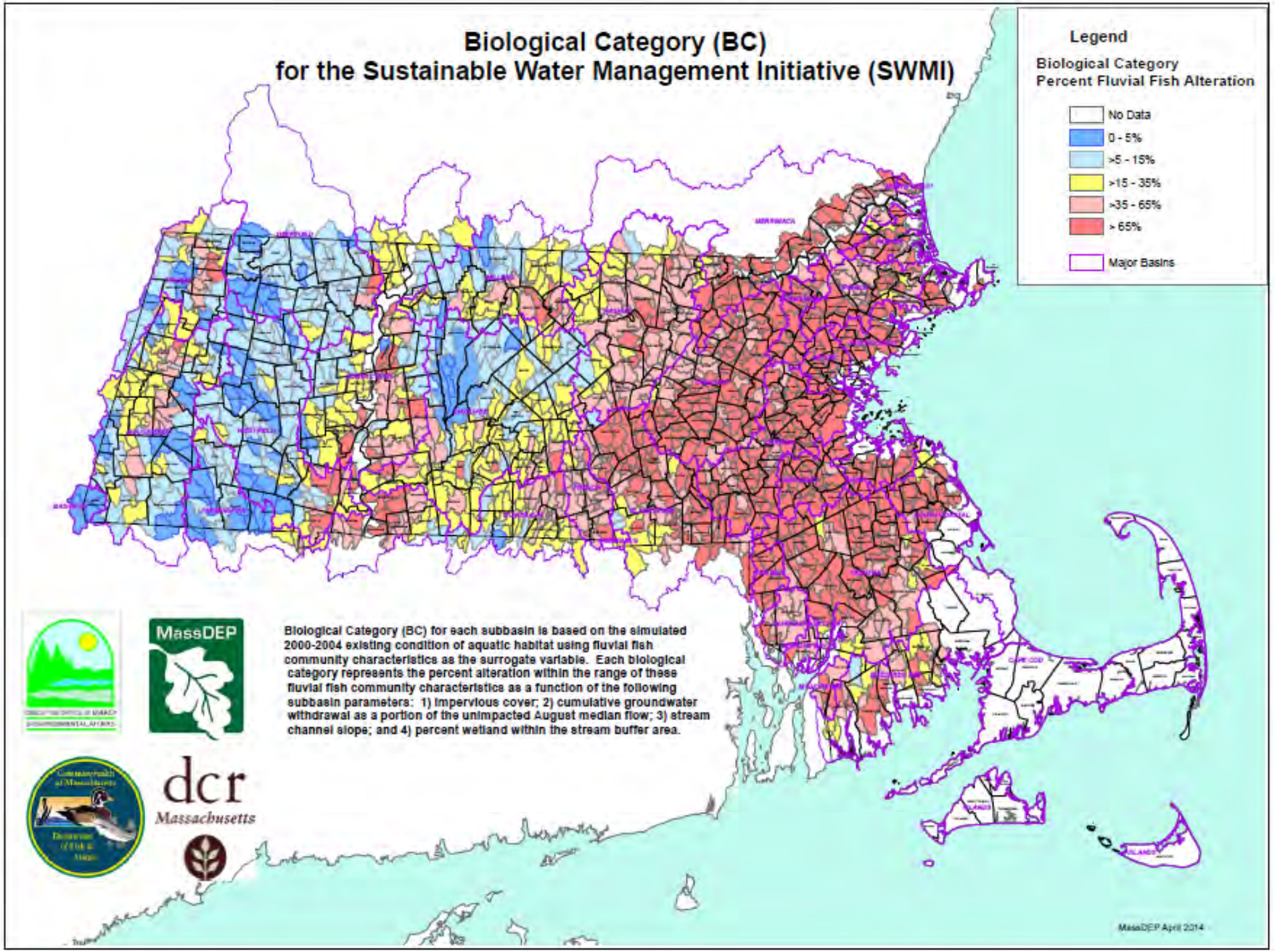
SYE

MWI

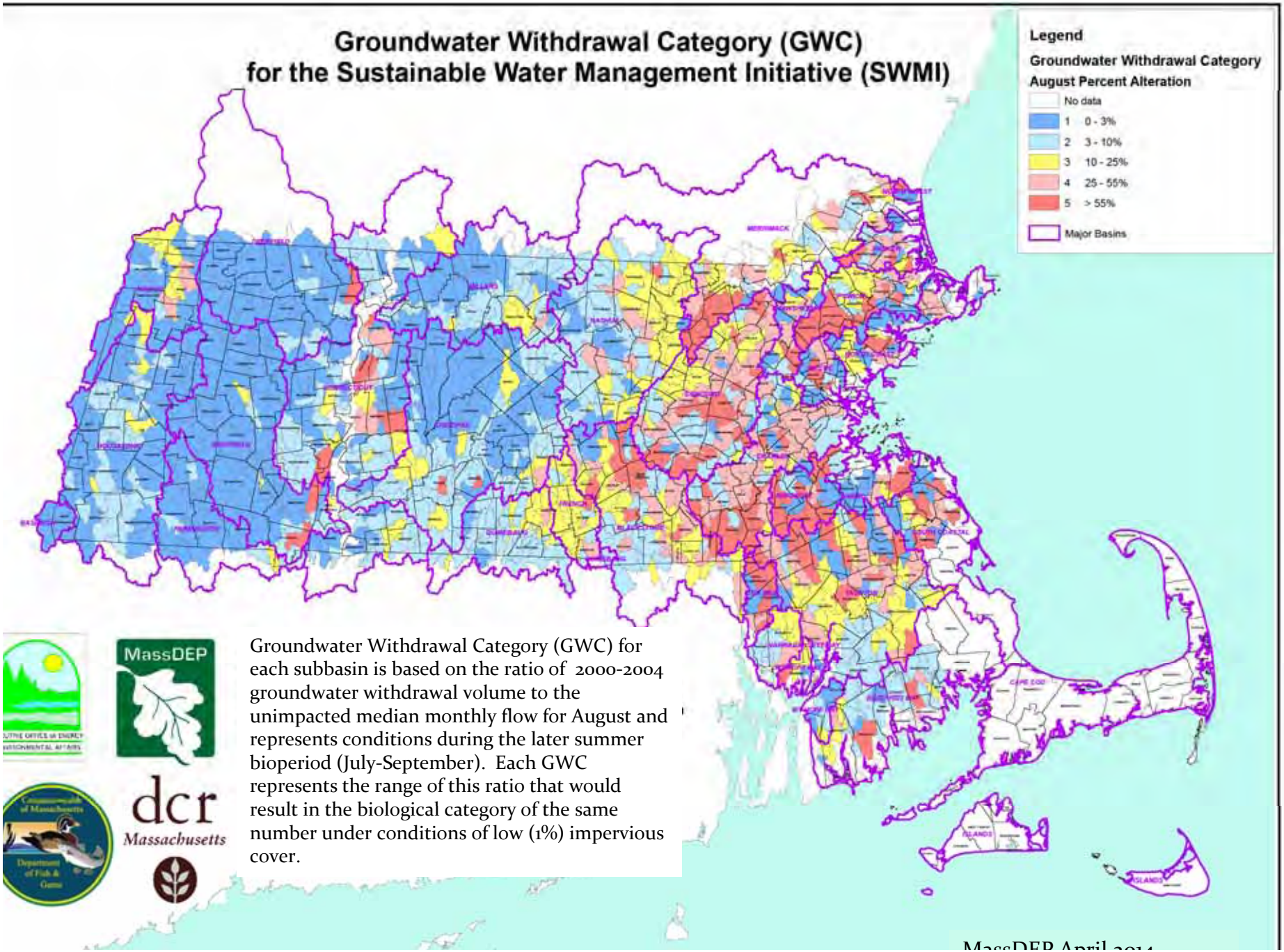
Fish and Habitat

- SWMI Advisory and Technical Committees helped us develop policy from science
- Five Biological and Groundwater Categories (1=least impact, 5 = most impact)
  - Categories use fluvial fish as surrogate for healthy aquatic habitat,
  - Impervious cover and August groundwater withdrawals used to represent impacts
- Streamflow Criteria mark the boundaries between categories (310 CMR 36.14)

Biological Category (BC)
for the Sustainable Water Management Initiative (SWMI)



Groundwater Withdrawal Category (GWC) for the Sustainable Water Management Initiative (SWMI)



Groundwater Withdrawal Category (GWC) for each subbasin is based on the ratio of 2000-2004 groundwater withdrawal volume to the unimpacted median monthly flow for August and represents conditions during the later summer bioperiod (July-September). Each GWC represents the range of this ratio that would result in the biological category of the same number under conditions of low (1%) impervious cover.

MassDEP

dcr
Massachusetts

MassDEP April 2014

New Permit* Requirements

- CFR Consult for withdrawals in subbasins with Coldwater Fishery Resources (CFRs)
- Minimization for groundwater withdrawals in "≥25% August Net Groundwater Depleted" Subbasins
- Mitigation commensurate with impact, for requests above baseline, in consultation with agencies
- Show no feasible alternative for requests that change a category

*Those with only registrations are not subject to these requirements

Coldwater Fisheries Resource (CFR) Consult

- Basin meeting serves as the preliminary consult
- Goal: Reduce impacts to CFRs through optimization
- Optimization template will be provided

Minimization

Required* in subbasins defined as having an August net groundwater depletion (NGD) of 25% or more by MA Water Indicator Study data.

(NGD= *Aug unaffected flow – Aug GW withdrawals + Aug GW returns)*

<u>Minimization Requirements (to the greatest extent feasible):</u>

- Desktop Optimization
- Water Releases and Returns
- Additional Conservation Measures

<u>*Permittees may avoid Minimization through:</u>

1. **Data refinement- showing August NGD is less than 25%, or**
2. **By conducting a Site-Specific Fish Community Assessment**

Mitigation

Mitigation Standard:

- "commensurate with impact", defined as:
  - volume of increase over baseline
  - does the increase cause a category change?
- considers cost and efficacy

Baseline is the largest of the following:

- 2003 – 2005 water use + 5%
- 2005 water use +5 %
- the community's registered volume
- Volume must be in compliance

Permit Tiers		Mitigation Requirements
Tier 1 = No increase above baseline	→	no mitigation
Tier 2 = Increase but no category change	→	commensurate mitigation
Tier 3 = Increase and category change	→	commensurate mitigation (2:1 if indirect mitigation) show no feasible alternative

Direct Mitigation

Can be volumetrically calculated

Eligible Activities:

1. Infiltration and inflow improvements
2. Stormwater recharge (directly connected impervious area redevelop to recharge)
3. Surface water releases

Indirect Mitigation Activities

Qualitative Credit System

- Remove dam/flow barrier
- Culvert replacements meeting crossing standards
- Stream bank/channel/buffer restoration
- Private well bylaw
- Stormwater utility, bylaw with recharge or implement MS4*

*must result in increased recharge to get credit

- Acquire property in Zone I or II, or for other resource protection
- Infiltration/Inflow removal program
- Install & maintain fish ladder

Mitigation Plan Development

Action hierarchy

1st: Demand Management to stay below baseline

2nd: Direct/quantifiable mitigation

3rd: Indirect/non-quantifiable mitigation

Location hierarchy (where a choice exists)

1st: same subbasin as withdrawals (considering water quality)

2nd upstream from the subbasin of withdrawals (considering water quality)

3rd: same major basin as withdrawals

4th: different major basin

Take cost and feasibility into account

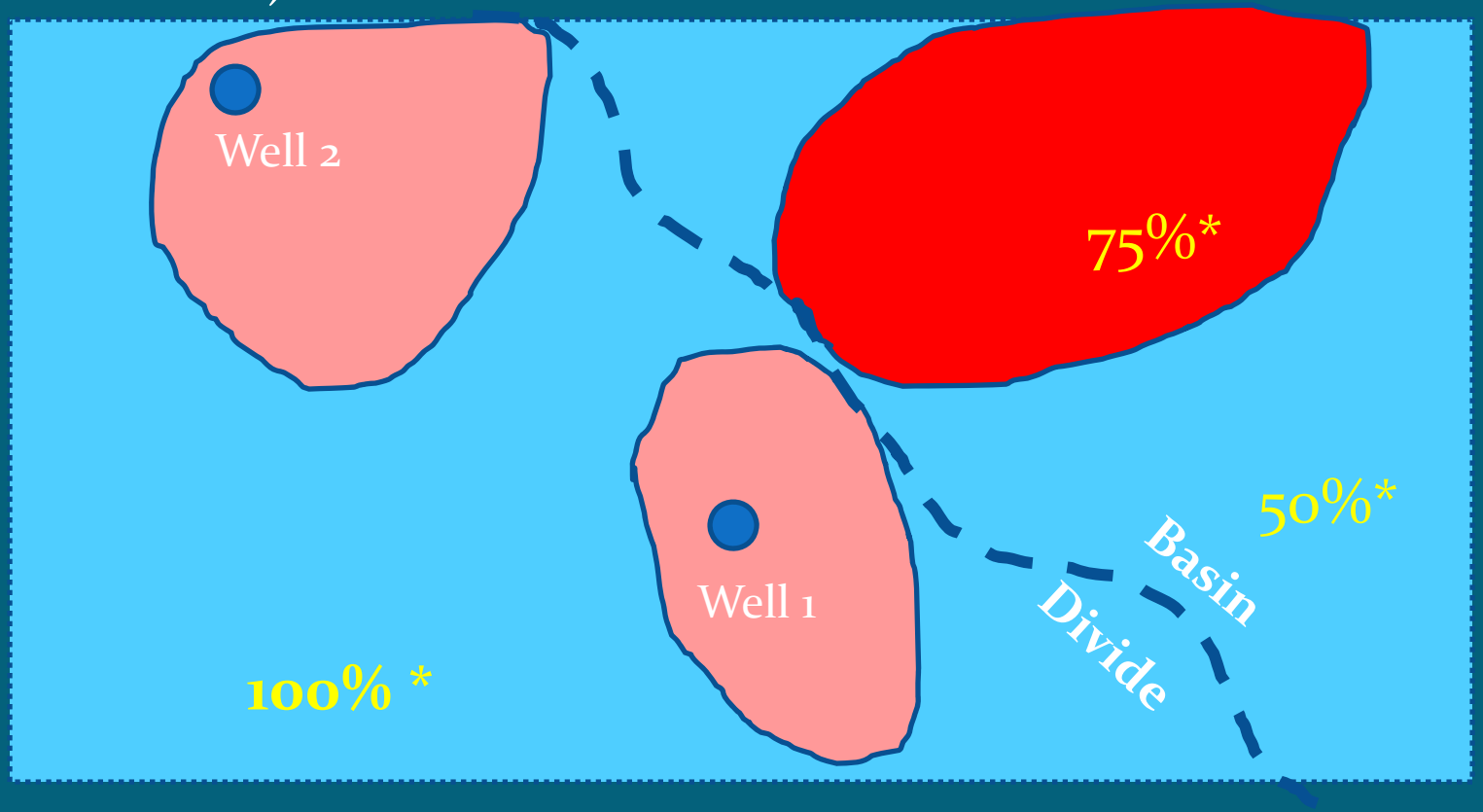
Mitigation Plan Timing

- Mitigation Plan is a live document
- Must be submitted at start of permit, can be phased-in based on use
- Retroactive credits (since 2005) considered if activity/benefit still in effect
- Volumes over Baseline must be mitigated prior to withdrawal (with allowances if withdrawals are already over baseline)

Mitigation Adjustments

Withdrawal location(s) and wastewater returns may result in adjustments in mitigation volumes and credits

- Wastewater Adjustment (* also adjusted by consumptive use factor)
- Location Adjustment Factor



South Coastal Basin Specifics

- Who withdraws & how much?
- What are my water use restriction triggers?
- Who needs to minimize?
- Who has Cold Water Fishery Resources?
- What is my baseline?
- Do I need to mitigate? Projected Tier?
- What mitigation options exist?

Total South Coastal Water Use

Use Type	Registered Users	Permitted Users	Registered Volumes (mgd)	Permitted Volumes (mgd)
PWS	13	12	23.87	10.35
Golf	5	5	0.48	1.01
Other	2	1	0.23	0.33
Cranberry*	60	2	12.01	0.24
Total	80	20	36.59	12.13

* 1345.9 registered cranberry acres & a total of 1494.6 acres.

Permitted South Coastal Users

Public Water Suppliers

Name	Registration Volume (mgd)	Permit Volume (mgd)	Total Authorized Volume (mgd)
Abington/ Rockland	2.21	-	2.21
Cohasset	.65	.30	.95
Duxbury	1.23	.62	1.85
Hanover	1.27	.11	1.38
Kingston	0.99	.57	1.56
Marshfield	3.07	.23	3.3
N. Sagamore	0.18	.35	0.53
Norwell	0.68	.72	1.4
Pembroke	0.99	.27	1.26
Pine Hills	-	.46	0.46
Plymouth	-	6.36	6.36
Scituate	1.49	.36	1.85

Other Users

Name	Registration Volume (mgd)	Permit Volume (mgd)
OS Golf Course (Plymouth)	-	0.22
Plymouth CC	-	0.11
Town of Plymouth Golf Course	-	0.2
Widows Walk Golf Course (Scituate)	-	.09
Pine Hills Golf Course	-	0.39
Pine Hills Landowners Irrigation	-	0.33
Crop Circle Cranberry (Kingston)	-	18 acres
Miller Bogs (Kingston)	21.67 acres	33.6 acres

South Coastal PWS Baseline Volumes

PWS	Baseline Volume	Reported Use 2011	Reported Use 2012	Reported Use 2013
ABINGTON/ ROCKLAND	2.46	2.5	2.6	2.59
COHASSET	0.79	0.72	0.76	0.79
DUXBURY	1.68	1.35	1.35	1.38
HANOVER	1.38	1.47	1.4	1.53
KINGSTON	1.54	1.22	1.19	1.24
MARSHFIELD	3.26	2.53	2.43	
NORTH SAGAMORE	0.53	0.44	0.42	0.37
NORWELL	0.68	0.57	0.56	0.67
PEMBROKE	1.26	1.29	1.32	1.24
PINE HILLS	0.23	0.28	0.32	0.34
PLYMOUTH	2.95	3.6	3.58	3.59
SCITUATE	1.80	1.41	1.59	1.51

All Volumes shown are in Million Gallons per Day

2 Basin towns

Reported Use Exceeds Baseline

South Coastal Non-PWS Baselines

Name	Baseline Volume (mgd)	Reported use 2011	Reported use 2012	Reported use 2013
OS Golf Course (Plymouth)	0.14	0.07	0.1	0.1
Plymouth CC	0.084	0.05	0.05	0.04
Town of Plymouth Golf Course	-	0.09	0.14	0.15
Widows Walk Golf Course (Scituate)	0.074	0.05	0.06	0.06
Pine Hills Golf Course	0.39	0.1	-	0.25
Pine Hills Landowners Irrigation	-	0.22	0.4	0.21
Crop Circle Cranberry (Kingston)	-	12*	12*	12*
Miller Bogs (Kingston)	55.27*	55.27 *	55.27*	55.27*

*Acres harvested

Nonessential Water Use Triggers

Trigger location	May- June Trigger Value	July – Sept. Trigger Value	7 Day Low Flow Trigger Value	PWSs assigned
Indian Head River USGS Gage	31 cfs	13 cfs	5 cfs	Abington-Rockland, Cohasset, Duxbury, Hanover, Marshfield, Pembroke, Norwell, Scituate,
Jones River USGS Gage	25 cfs	16 cfs	7.3 cfs	Kingston
USGS Well PWW-22 (Plymouth)	Below 25% percentile for each month			Plymouth, Pine Hills, North Sagamore

Online SWMI Interactive Maps

- GIS map provides an interactive graphic display that includes:
  - GWC & BC
  - August Net groundwater depletion
  - Water use points
  - Cold Water Fishery Resources
  - Aquifers and more

- Map is at

http://www.mass.gov/eea/agencies/massdep/water/watershed/sustainable-water-management-initiative-swmi.html

DEP Permitting Tool

- Displays data and equations to determine BC, GWC, August NGD for 1400 subbasins.
- User may increase or decrease water use and see resulting change in above values.
- Two main views:
  - PWS information includes: recent usage, baseline volumes, projected usage, sources, and other users
  - Subbasin information includes: cumulative area, % of impervious cover, streamflow values, etc.

DEP Permitting Tool

Find by Subbasin ID: 22019 | Find by PWS System Name: | Find by PWSID: | Find PWS by Town Name:

Click to use pull downs and to View All Subbasins | All Water Use Points in Subbasin Report | Calculation Tool Report

Click on "X" in upper right of this form to close this window and return to main page.

Double Click on Sub Basin ID to view water use volumes

Subbasin Characteristics

Sub Basin ID:	Major Basin:	HUC12 Name:
22019	South Coastal	Indian Head River-Indian Head Brook to mouth

Subbasin Cumulative Data (includes this subbasin and all upstream contributing subbasins)

Subbasin Information		August Wastewater Discharges (mgd)		August Groundwater Withdrawals (mgd)		Additional GW Withdrawal Volume to Cause a Change in Existing GWC and BC:	
Area (Square Miles):	14.95	Ground Water Discharge:	0.000	PWS and Commercial Wells:	1.264	To Change GWC (mgd):	0.421
Impervious Cover (%):	12.3	Septic Systems:	+ 0.602	Private Wells:	+ 0.049	To Change BC (mgd):	0
Surface water withdrawals exist in or upstream of subbasin:	YES	Total Subsurface Discharge:	= 0.602	Total Groundwater Withdrawals:	= 1.313		
		Surface Water (NPDES):	0.000				

Individual Subbasin Data (only includes this subbasin)

Coldwater Fisheries Resource Exist: Yes

Net Groundwater Depletion (NGD)

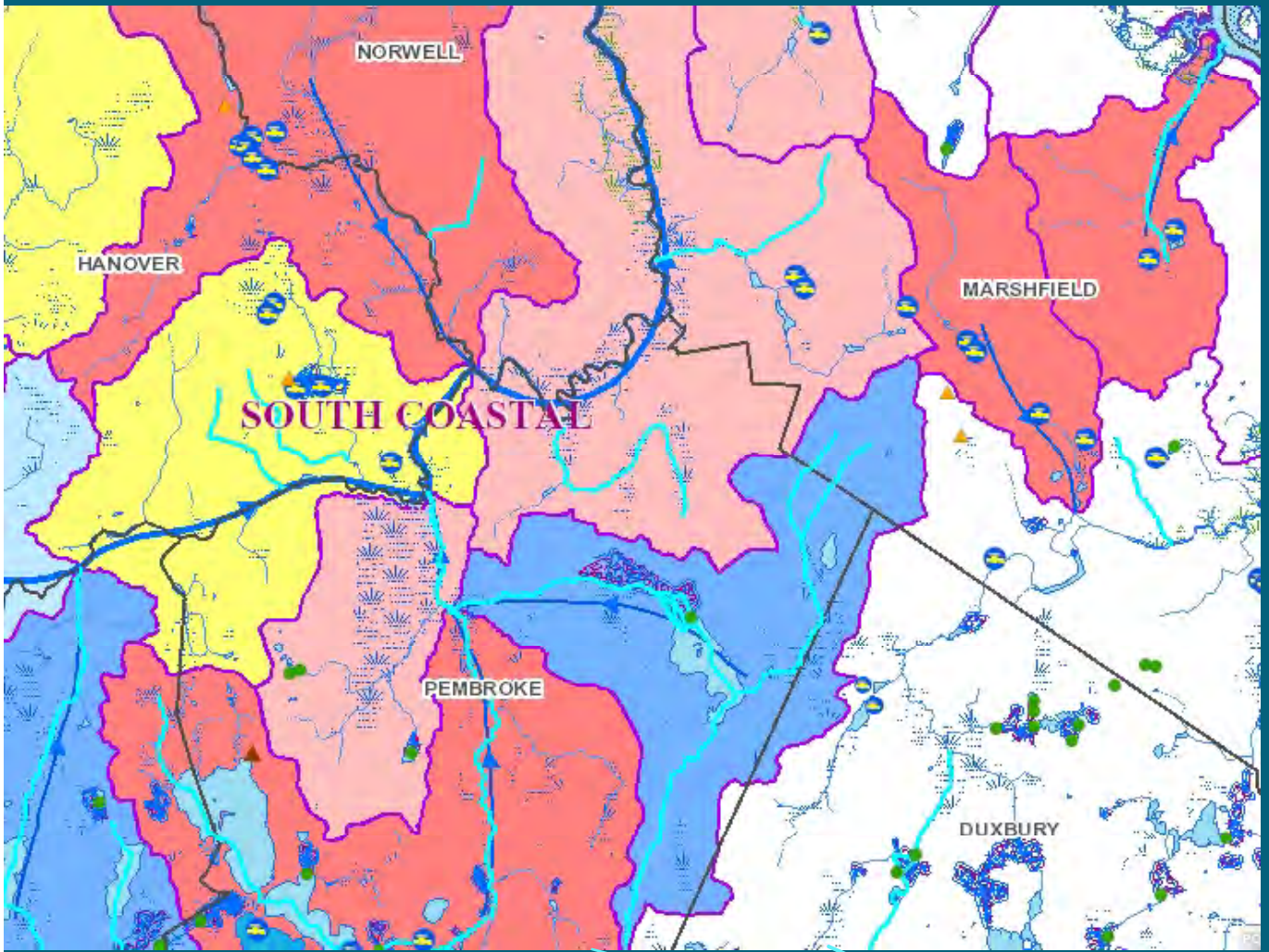
Net Groundwater Depletion (%): 22.6

Positive value indicates depleted.
Negative value indicates surcharged.

Unaffected streamflow, Ground Water withdrawals, Groundwater Withdrawal Category (GWC) and Biologic Category (BC).

Estimated August Condition			Proposed Changes to existing GW Withdrawal			Existing vs. Proposed	
			Change (+/-) to existing GW Withdrawal (mgd)		0	Calculate / Clear	
Unaffected Streamflow (mgd)*		3.151	Unaffected Streamflow(mgd)		3.151		
GW Withdrawals (mgd)**	-	1.313	Proposed Total GW Withdrawal (mgd)	-	1.313		
(Unaffected Streamflow) - (GW Withdrawals)	=	1.839	(Unaffected Streamflow) - (Prop. GW Withdrawal)	=	1.839		
(GW Withdrawals) / (Unaffected Streamflow)	=	41.7%	(Proposed GW Withdrawal) / (Unaffected Streamflow)	=	41.7%	0.0%	Percent Difference
Groundwater Withdrawal Category (1-5)	GWC:	4	Proposed Groundwater Withdrawal Category (1-5)		4	NO	Change in GWC?
Biologic Category (1-5)	BC:	5	Proposed Biologic Category (1-5)		5	NO	Change in BC?

Coldwater Fishery Resources

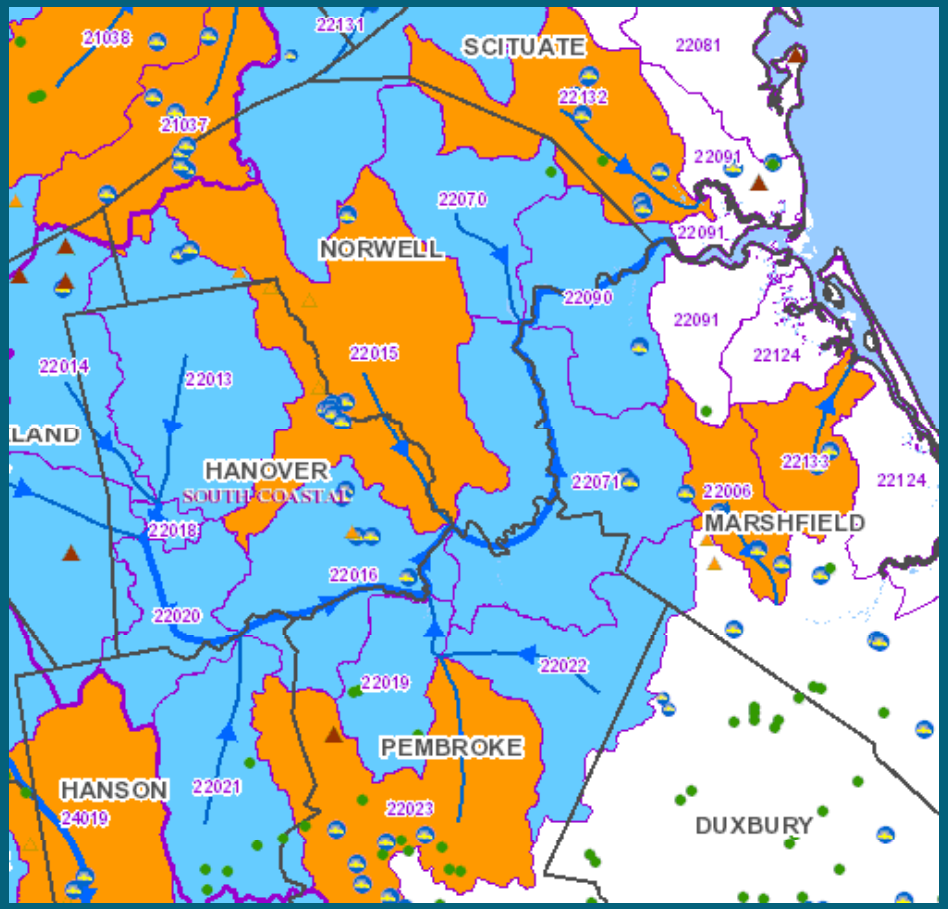


CFRs are light blue

CFRs are considered a particularly sensitive receptor warranting protection.

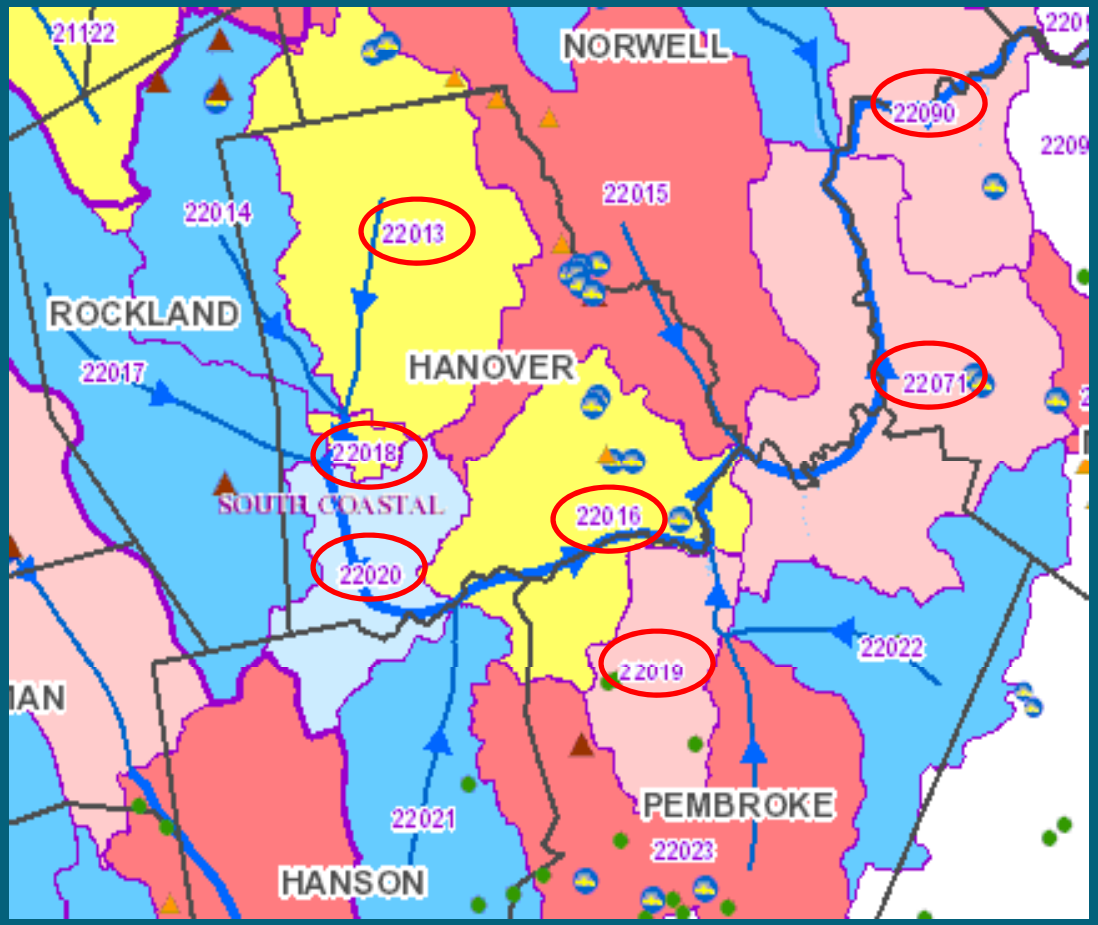
PWS Potentially Impacting CFRs
Abington-Rockland
Hanover
Kingston
Marshfield
Norwell
Pembroke

Minimization Requirements



Town	Subbasin(s)	Aug NGD %
Norwell	22015	49%
Hanover	22015	49%
Scituate	22132	94%
Marshfield	22006 22133	342% 148%
Pembroke	22023	59%

Subbasins with Potential GWC changes



Sub-basin	MGD to change GWC	GW towns in or upstream
22013	.09	Hanover, Norwell
22018	.32	Hanover, Norwell
22020	.22	Hanover, Norwell
22016	.46	Hanover, Norwell & Pembroke
22019	.42	Pembroke
22071	3.93	All of above & Marshfield
22090	4.76	All of the above

Summary Info for Permits

PWS	CFR present	Minimization required	Projected Permit Tier	Alternative analysis
Abington-Rockland	Yes	No	2	No
Cohasset	No	No	2	No
Duxbury	No	No	1	No
Hanover	Yes	Yes	2 or 3	?
Kingston	Yes	No	1	No
Marshfield	Yes	Yes	1	No
N. Sagamore	No	No	1 or 2	No
Norwell	Yes	Yes	2 or 3	?
Pembroke	Yes	Yes	2	?
Pine Hills	No	No	2	No
Plymouth	No	No	2	No
Scituate	No	No	2	No

Community-Specific One-Page Summary Sheet

- Includes 6 summary tables:

1) Reported Use 2009-13
2) Performance Standards
3) WNF Scenarios
4) Permit Data
5) Subbasin Data
6) Streamflow Triggers

example

Permit Requirements*	
CFR Consult?	Yes/no
Minimization required?	Yes/no
Estimated renewal request in mgd	1.47
Baseline (BL) in mgd	1.54
Projected increase above BL in mgd	-0.07
Estimated Permit Tier	1
Mitigation Required?	no

*includes comments to explain data sources and decisions

WMA Regulations and Permit Assistance

- Regulation and Policy Development (Final in November)
- Permit application forms and worksheets (Winter 2014)
- Financial assistance (Annual Grant Program)
  - Eligible planning projects:
    - Optimization
    - Outdoor water use restrictions
    - Implementation of reasonable water conservation
      - NEWWA and MWWA Toolbox of BMPs
  - Eligible implementation projects:
    - Demand management (water audits, soil moisture sensors etc..)
    - Mitigation projects designed to improve flow impacts

      ex. dam removal, culvert replacement, etc.

Further information

- MassDEP Technical Resources webpage at:
  http://www.mass.gov/eea/agencies/massdep/water/watersheds/sustainable-water-management-initiative-swmi.html

- MassDEP SWMI webpage at:
  http://www.mass.gov/dep/water/resources/swmi.htm

- Massachusetts Sustainable Water Management Initiative (SWMI), Framework Summary, November 28, 2012 at :
  http://www.mass.gov/eea/docs/eea/water/swmi-framework-nov-2012.pdf

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