Comprehensive Water Resources Management Plan

Needs Assessment

March 29, 2012
Sandwich, Massachusetts

Presented by:

Outline

• Overview for this Meeting
• Existing Conditions
• Water Resource Protection
• Future Conditions
• Next Steps
• Questions & Discussion
Overview

Wright-Pierce is working with the WQAC to develop a town-wide water resources mgmt plan:
- due to be completed in 2013
- funded by EOEEA “Textron” grant

Wright-Pierce is conducting a parallel study to pursue concept of an “interim solution”
- Draft report presented to the Board in Sept 2011
- Facilitate economic growth
- Be operational in 1 to 4 years
- Fit into the Town’s long-term plans (CWRMP)

What is a CWRMP?

- Town-wide plan to:
  - Identify water quality needs
  - Identify options/solutions
  - Recommend capital improvements
  - Identify funding/financing mechanisms

Comprehensive Water Resources Management Plan
Status of the CWRMP

- Phase 1 - Needs Assessment
- Phase 2 - Identify & evaluate solutions
  - cost-effectiveness
  - environmental impact
  - public acceptability
- Phase 3 - Develop recommended plan
- Phase 4 - Complete regulatory reviews

*This presentation does not address alternatives, solutions or costs.*

Existing Conditions
Existing Conditions

- Land Use and Demographics
- Envt. Sensitive Areas
  - Public and Private Water Supply
  - Fresh Water Ponds – Phosphorus
  - Coastal Embayments – Nitrogen
  - Protected Areas (ACECs, wetlands, etc.)
- Soils
- Groundwater
- Existing Water Use & Wastewater Flows
- Regulatory Environment

Land Use and Demographics

- Population
  - 23,000 year round (2008)
  - 40,800 peak seasonal (estimated)
- Land Use:
  - 10,500 parcels total
  - 8,500 developed residentially (80%)
  - 300 commercial or industrial (3%)
  - 1,700 parcels vacant (16%)
  - Approx. 1,000 vacant parcels considered developable
Environmentally Sensitive Areas

- Ponds
- Coastal Embayments
- ACEC – Scorton Creek
- DCPC – Three Ponds
- Wetlands/Vernal Pools
- Conservation Lands
- Open Space
- Shellfishing areas
- Flood Plains
- Sole Source Aquifer
- Habitat of Rare and Endangered Species

Soils

- Soil Suitability is classified by Natural Resources Conservation Service (NRCS)
  - 90% - as well drained
  - 5%   - as moderately well drained
  - 5%   - as poorly drained
  - 100% - as “severe” for septic system disposal
Groundwater Threats

- MMR plumes
- WW systems
- Landfill
- Septage lagoons
- Gravel mining
- Industrial Park

Water/Wastewater Quantities

- Water Use (2007 to 2009 data set)
  - Annual avg. of 1,850,000 gpd
  - 68% by Water District
  - 32% by Private Wells

- Wastewater Generation
  - Annual avg. of 1,667,000 gpd
  - Traditional systems - 97%
  - I/A systems – 1,000 gpd (<1%)
  - Tight tanks – 16,000 gpd (<1%)
Current Flows By MEP Watershed

Sandwich Harbor 22%
Scorton Creek 22%
Popponesset Bay 18%
Three Bays 16%
Waquoit Bay East 5%
Sandy Neck 6%
4 others 11%

Current Flows by LCP SPA

Old King’s Highway 2%
East Sandwich Residential 15%
Forestdale Residential 17%
Growth Tech/Golf Course 0%
Historic Village 2%
MMR 0%
North Sand. Neighborhoods 16%
Ridge 5%
Rt 130 Medical Park 0%
Sandwich Industrial Park 1%
Scussett Beach 1%
South Sandwich Residential 34%
SSVC 2%
Marina/Tupper Rd 2%
Village Center Neighborhoods 2%
Water Resource Protection

Fundamental Question

“On which properties is a traditional (Title V) on-site wastewater system an adequate means of providing for the Town’s sanitation needs and environmental protection requirements, and on which properties is it not?”
Water Resource Protection

- Looked at in 5 ways
  - Sanitary Needs
  - Convenience and Aesthetics
  - Protecting Groundwater and Water Supplies
  - Protecting Surface Waters
  - Enabling Sustainable Economic Growth

Sanitary Needs

- Title V Variances for a 10 year record
- Water use intensity (gpd/sf of parcel)
- Properties near receiving waters with high bacteria counts
- Identified
  - 139 properties
  - 68,400 gpd
**Convenience and Aesthetics**

- Mounded Systems
- Tight Tanks
- Frequent pumping
- Enhanced treatment systems (I/A)
- High Replacement Cost systems

**Identified**
- 1,066 properties
- 122,200 gpd

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**Water Supply Protection**

- **Public Wells**
  - Zone I - 400ft radius
  - Zone II - 180 days pumping, max yield
  - Nitrates & CECs

- **Private Wells**
  - 2 areas with high nitrates

**Identified**
- 152 properties
- 27,200 gpd
**Freshwater Ponds**

- Reviewed by Water Resource Services
- Limited data available
- Assessed for multiple factors
- Some “medium” to “high” priority needs
- Recommend add. data collection

- Identified
  - 559 properties
  - 107,970 gpd

**Coastal Embayments**

- Mass. Estuaries Project (MEP) is the regulatory driver for nitrogen control
- MEP Reports completed for some watersheds
- “Placeholders” used for other watersheds

- Identified
  - 2,540 parcel equiv.
  - 508,000 gpd
Economic Growth

- LCP identified 4 areas where WW needed
  - SSVC
  - Industrial Park
  - Marina
  - Historic Village and Village Center
- Identified:
  - 0 gpd for “current conditions”
  - 223,300 gpd for “future conditions”

Water Resource Protection

Needs Overlap!
Aggregated Needs (Current)

- Identified
  - 3,306 properties
  - 592,500 gpd

Future Conditions
Future Conditions

- “Current” flow
  - Existing conditions
- “New” flow
  - Worked closely with Planning Department and WQAC Planning Board representative to review projections of LCP
  - Projected growth for residential, commercial and industrial
  - Considered development of vacant parcels
  - Considered redevelopment of existing properties
- “Future” flow
  - Projected conditions at a point in the future

Current + New = Future

Wastewater Flow Projections

- Current 1,667,000 gpd
- Theoretical Build-out 2,422,000 gpd (+45%)
- Planning Horizon 2,164,000 gpd (+30%)

- Planning Horizon
  - Established as 2040
  - Established as 2/3rds of Theoretical Build-out
  - Estimated year round population of 30,100
### Future Flows By MEP Watershed

<table>
<thead>
<tr>
<th>Location</th>
<th>Flow (%)</th>
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<tbody>
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### Future Flows by LCP SPA

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• Growth projections were sorted by Strategic Planning area and by watershed

• New flows and future flows were compared to the same 5 categories of need

• Identified for Planning Horizon
  - 1,077,000 gpd
Next Steps

- Initiate Phase II – Alternatives Analysis
  - Prioritize wastewater needs by watershed
  - Identify wastewater management tools
    - Structural & Non-Structural Options
    - Conventional & Innovative Options
    - Regional Options
  - Analyze by watershed
  - Conduct cost-effectiveness analysis

Next Steps

- Restart a regular sampling program of the prioritized ponds.
- Support the upcoming Stormwater Mgmt Plan Update
- Support household haz. product collection
- Facilitate release of MEP technical reports for Sandwich Hr. and Scorton Ck.
- Initiate discussions regional coordination with neighboring communities.