West Acton Center Sewer Extension Project

Acton Board of Selectmen Meeting
November 21, 2016
Acton’s Wastewater History

- 1960s Discussion Began
- 1980s Approvals for small commercial area
- 1990s Progress on concepts
- 2000s Built Treatment Plant & Sewers
- 2004/2006 Comprehensive Wastewater Resources Management Plan (CWRMP)
- 2008 Feasibility Study
  - West Acton Center – Spencer/Tuttle/Flint
- 2016 West Acton Center Basis of Design Report (2016)
West Acton Center
West Acton Center Sewer Extension Project

Why West Acton?

- CWMP Needs Area requiring off-site wastewater solution.
- Both public groundwater improvements & economic development opportunities.
WEST ACTON CENTER
- 183 Parcels
- 225 Structures
- 350-500 SBUs
- Flow=26,000 gpd
Available Wastewater Capacity*

- WWTF Effluent Capacity: 299,000 gpd
- Current Average Daily Flow: 130,000 gpd
- Capacity unallocated and/or available: 68,000 gpd

Needs:
- West Acton Center: 26,000 gpd
- Kelley’s Corner: Unknown
- Spencer/Tuttle/Flint: 21,000 gpd

* Without additional groundwater disposal capacity
Available Capacity at WWTP

*Remaining capacity must include allowance for reserved flow from parcels not yet connected.
Conceptual Cost & Funding

- Total Conceptual Cost: $10.5M

- Funding Options Under Discussion
  - State Loans
  - Economic Development Grants
  - Betterments
  - State Paving Funds
  - Others
### West Acton Sewer Extension Project

<table>
<thead>
<tr>
<th>Conceptual Schedule</th>
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<tbody>
<tr>
<td>Determining Funding Options</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Submit State SRF Loan Applications</td>
<td>Done</td>
</tr>
<tr>
<td>Public Outreach &amp; Discussions</td>
<td>Winter 2016</td>
</tr>
<tr>
<td>ATM – Approval of Design Funds</td>
<td>Spring ATM 2017</td>
</tr>
<tr>
<td>Detailed Design &amp; Permitting</td>
<td>July 2017 - October 2017</td>
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<tr>
<td>SRF Submittal (if appropriate)</td>
<td>October 2017</td>
</tr>
<tr>
<td>ATM – Approval of Construction Funds</td>
<td>April 2018</td>
</tr>
<tr>
<td>Advertise for Bid</td>
<td>July 2018</td>
</tr>
<tr>
<td>Start Construction</td>
<td>August 2018</td>
</tr>
<tr>
<td>Finish Construction/Start Sewer Connections</td>
<td>November 2019</td>
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<tr>
<td>Finish Construction (Paving)</td>
<td>June 2020</td>
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</tbody>
</table>
Questions & Discussion
Sewer Layout Criteria

- Areas defined in Scope of Work (including Douglas & Gates Schools)
- Natural Topography – sewer depth/rivers
- Available Capacity up to 68,000 gpd (based upon actual winter water use)
- 678 parcels in sewer area
- 380 parcels connected (56%)
- 1,841 SBUs in area
- 1092 Connected (59%)
Direct Costs: Construction Cost Categories at Concept Level

- 8” PVC Sewer – varying depths
- 6” PVC Service Stubs per structure
- PVC Low Pressure Sewer
- Pumping Stations
- Paving Trenches – Local & State roads
- Paving Overlay – Local & State roads
- Water main & drain pipe replacement
- Ledge & Rock Removal
- Construction Contingency - 5% to 20%
Indirect Cost Categories at Concept Level

Based on Construction Costs

- Design & Permitting – 10%
- Procurement & Construction Engineering – 15%
- Administration (Police, Financing, Legal) – 10%
- Contingency – 5%
Lessons Learned from Previous Acton Projects

- Need to account for price escalations prior to construction (2 years in this case)
- Include sufficient contingency
- Concept Designs may change slightly as design details become available
- Financial Models for Costs are key
  - Betterments
  - Operation costs
  - Working capital
  - Connection costs
Financial Impacts at the Feasibility Study level

- **Design & Construction Costs**
  - Based upon current construction climate

- **Capacity Allocation Costs**
  - Governed by Acton Sewer Bylaw

- **Inflation/Escalation Costs**
### Design Services Flowchart

#### Acton, Massachusetts

**Sewer Extension – Typical Flowchart of Events**

### Feasibility & Design Basis

<table>
<thead>
<tr>
<th>Task 1.0</th>
<th>Task 2.0</th>
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</thead>
<tbody>
<tr>
<td>Feasibility Study &amp; Concept Design</td>
<td>Design Basis Report</td>
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</tbody>
</table>

- Kick-off meeting
- Define project purpose and drivers
- Identify stakeholders and their roles
- Collect data on flows and loads
- Identify possible solutions
- Evaluate possible alternatives based on stakeholder input
- Recommend viable alternatives
- Prepare order of magnitude cost estimate on recommended solutions
- Identify permitting parties
- Identify site constraints
- Prepare “Order of Magnitude” construction cost estimate and design budget (±20%)

### Design

<table>
<thead>
<tr>
<th>Task 3.0</th>
<th>Task 4.0</th>
<th>Task 5.0</th>
<th>Task 6.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary Engineering</td>
<td>Permit Preparation &amp; Approvals</td>
<td>Prepare Final Design</td>
<td>Procurement</td>
</tr>
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- Geotechnical investigation (borings) for information in limited areas
- Architectural concepts / narrative
- Wetlands delineation
- Instrument survey
- Identify easements & PS sites
- Public outreach
- Update probable construction cost estimate to ±15%

- Local: Conservation & DPW permits
- DEP Sewer Extension Permit
- MassHighway Permit
- Stormwater General Permit

- Geotechnical investigation (borings) for complete site
- Final equipment and piping plans, elevations and details
- Final architectural plans, elevations and details
- Final instrumentation plans and details
- Final electrical plans and details
- Energy optimization plan
- F, F & E selections
- Technical specifications
- Division O & I of specifications
- Final Detailed Cost Estimate (±10%)
- Installation & startup plan
- Easement agreements finalized
- Develop considerations for construction sequencing and traffic control
- Secure funding for construction
- Public outreach/meetings

### Notes:

1. Tasks can run concurrently; however, they are generally performed in this sequential order.

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**Completed 2016**

**Upcoming 2017**