TOWN OF HARVARD

TOWN CENTER SEWER ACTION GROUP

A Sub-Committee of The Harvard Board of Selectmen

January 20, 2009

Town Center Sewer Action Group
Report to the Board of Selectmen

Executive Summary - Background

Approach and Assumptions

In keeping with our charter, we considered the cost and benefit to the town's taxpayers and district residents of a number of possible town center septic/sewer options, including:

1) Do nothing option.
2) Municipal only septic solution utilizing on-site septic disposal solutions
3) Municipal only utilizing current waste water treatment facility processing capacity.
4) Combined municipal/private district with various property/service area scenarios.
5) Scenarios 3-4 above with a senior housing development

Assumptions behind the analysis and recommendation are:

1) Massachusetts DEP will allow 80% utilization of the Mass Ave waste water treatment facility's 23,000 GPD design capacity (18,400 GPD)
2) System utilization can be projected based on actual historic use and use projections discounted from Title 5 design flow rates.
3) No capitalization or apportionment of existing waste water treatment infrastructure.
4) No allocation of new capital costs to existing town users (HES, Bromfield, and Library).
5) Use Title 5 flows for apportionment of capital costs between municipal and private participants.
6) Use Uniform Unit method of assessing betterments for capital cost recovery.
7) Use actual flows for assumptions around sharing of operating costs.
8) All properties served by the collection system will pay a betterment on common infrastructure; capital cost of individual service elements (packaged pump systems) can be capitalized separately.
9) Sewer district boundaries shown are for the 2005 design proposal and are subject to further discussion and review.
10) A high connection and utilization rate is a critical economical and political success factor.

Engineering and Modeling

Engineering work from prior planning and assessment was leveraged, with two significant changes from the 2005 exercise. The change from Title 5 design flows to actual flow based system capacity calculations eliminated the costs associated with land acquisition and treatment plant expansion envisioned in 2005. A design change assumption revisited the gravity collection design to utilize low pressure force mains with grinder pumps on each property, resulting in reduction of projected construction costs by 28% and increase in allowed capacity of 10%

A data-driven spreadsheet model was created with the following inputs:

- Streets/properties included and flows required
- Financing rates and terms
- O&M and capital costs
- Projected connection rate

And the following outputs:

- Cost to town and taxpayer
- Cost per property served – total betterment, monthly O&M

Needs assessment and public input

Public insights gathered through lightly attended regular meetings and two coffees indicate that support exists amongst the private stakeholders in the proposed district area and some vocal support exists in the community. Key concerns in the past and present are:

- Capital and operating costs
- Taxpayer funds going towards the benefit of the private citizens who would receive sewer service
- Concerns over some district residents “opting out”
- Concerns over money spent to date on the treatment facility coupled with concerns over reports of difficulties in operation

Executive Summary - Recommendation

Recommendation Overview

To provide needed sewer collection for the Town Center at the lowest possible cost to both the general taxpayer and properties served by the system, the Town Center Sewer Action Group recommends a Low Pressure Sewer System (LPSS) utilizing existing treatment capacity at the Massachusetts Avenue waste water treatment facility to serve 64 existing properties in the Town Center, including Town Hall, Hildreth House, the Old Library, the existing commercial use properties on Still River Road, Massachusetts Avenue and Pond Road and the three churches. A preliminary sewer service area map is provided. The capitalized construction costs for this LPSS would include the waste water treatment plant upgrades recommended by our consulting engineers and the replacement of the existing pump station at Harvard Elementary School. Our consulting engineers assure us that both of these expenditures will eventually be needed and would otherwise be borne by the taxpayers.

The preliminary LPSS construction cost estimate is shown below.

Force Main (6,905 linear feet)	400,490
Grinder Pumps (64 @ $5,500)	352,000
Transfer Mains	19,500
Pump Station (1@35 GPM)	150,000
WWTF plant upgrades (incl. design)	571,100
	1,493,090
Permitting, design and construction services	420,000
Subtotal	1,913,090
Contingencies (20%)	382,618
Project Subtotal	2,295,708

Capacity Utilization

Based on historical water usage data and in a limited number of cases, projected future use, at 100% participation by properties served by this system, the district would have a daily flow of approximately 14,100 gallons when the schools are in session. This represents 77% of the 18,400 gallons per day that DEP has indicated it will allow the plant to treat and discharge.

Our present recommendation is based entirely on existing structures, historic water use and/or foreseeable changes of an existing use enabled by sewer connection; the General Store being the prime example. There are significant public policy issues in prioritizing excess capacity use and their consideration is outside this group's charter. Potential uses of excess capacity include extension of sewer district boundaries to improve drinking water source protection, increases in school population, changes in use if a Town Center Overlay District is created and affordable housing development.

Low Pressure Sewer System Configuration

A small tank and grinder pump would be installed at each property using the sewer system. These pumps grind the solids into small pieces and provide a pressurized discharge to the comparatively small diameter sewer mains, which forces the discharge to the collection point(s). The LPSS collection mains can follow ground contours and are much less expensive to install than a gravity system's (much deeper) fixed slope collection mains that carry flows to pump stations. These gravity system pump stations in turn must have back-up power and daily inspections adding significantly to both construction and operating costs.

Capital Cost Recovery Methodology

The capital costs of construction would be recovered by the assessment of a betterment fee on all the properties served by the sewer system. The capital costs to be recovered by betterment assessment would include the collection piping, the replacement of the HES pump station, the waste water treatment facility upgrades and associated permitting, financing and construction management costs. The betterment would be apportioned on the Uniform Unit method (one of two methods permitted under MGL Chapter 83, section 15) where the basic "betterment unit" is a single family house. Each single family house would be assessed the same betterment, regardless of frontage, area, bedroom count or valuation. Additional fees for the cost of the tank and pump and connection to the sewer system would be charged to those properties connecting to the system. Betterment charges for non-residential properties would be assessed based on Title 5 septic design criteria for that class of use divided by the Title 5 design flow for a standard residential unit, but not less than a standard betterment unit. The capital costs would be divided by the total number of betterment units.

In terms of timing of the assessments, a partial betterment assessment may be made before construction is complete that is less than or equal to one half of the Town's liabilities under all contracts. Final assessments are made when construction is complete and the actual costs determined. Betterment charges and fees not paid within 30 days are apportioned over a 20 year period. The Town places a municipal lien on the property and charges interest on the unpaid principal.

Betterment Charges

An average betterment of $36,502 results from the application our stated assumptions when 95.4% of the capital costs are divided among the 60 private properties. This includes $5,500 per property for the packaged pump system.

If the capital costs are apportioned over twenty years the applicable interest rate determines the annual cost assessment. If the project is financed through the State Revolving Fund (SRF) at 2% interest and that this rate is used on the apportioned betterment and charges[1] , the average annual capital recovery assessment per property over the twenty year period will be approximately $2,200. At 5%, the average annual capital recovery assessment per property over the twenty year period will be approximately $2,800.

Operating and Maintenance Costs

Current plant O&M is budgeted at $85,000 without extraordinary items. Future system operating costs with a sinking fund allocation are estimated at $100,000 per year. Assuming full participation in the system, the annual average usage charges are estimated at $800. Unless capped, lower participation rates will increase usage charges. Electricity, maintenance and an allowance for pump replacement in year twenty is estimated at $155 per year.

Taxpayer Impacts

During the initial phase of financing, when the system is under construction and betterment assessments have not been made, the Town may see an increase in debt service but it avoids the future cost of treatment plant upgrades and HES pump station replacement. After this period, the town saves roughly $33,500 a year, costing the average taxpayer $18 per year less than if the Town continued to be the sole user of the waste water treatment facility.

Acceptance and Implementation

If the Board of Selectmen votes to accept our recommendation and determines that they will sponsor articles at Town Meeting so that the town can resolve the town center sewer question, they should undertake, or delegate as appropriate, the following steps:

- ☑ Conduct new survey within proposed service area to determine support and likely participation rates.
- ☑ Validate and publish TCSAG reports and projections.

[1] Requires Home Rule Petition, MGL C 83 allows interest charges on unpaid principal at either 5% or 2% more than bonded rate.

- ☑ Establish and document district boundaries.
- ☑ Contract for additional technical services
  - Ledge test boring to reduce uncertainty of construction cost estimates.
  - Perform sufficient preliminary design work to determine approach to waste water treatment plant upgrades for de-nitrification treatment and flow capacity equalization so that cost estimate can be reduced.
  - Attend public meetings as needed.
- ☑ Conduct public hearings/information presentations and other means of information distribution.
- ☑ Preparation and legal review of appropriate Town Meeting Articles to
  - Authorize creation of a sewer district
  - Authorize project debt
  - Adopt necessary sections of MGL Chapter 59 for Hardship deferrals.
  - Authorize capital assessment and adopt procedures.
  - Create governance body and adopt rules and regulations
- ☑ Identify likely finance options.
- ☑ Prepare home rule petition for any needed legislation.
- ☑ Seek Water Commission input on Bolton Road and Pond Rd well protection issues.
- ☑ Consider contract for engineering evaluation of potential cost and likelihood of on site septic solution for municipal buildings.
- ☑ Establish priorities for the use of excess waste water treatment capacity.
- ☑ Create critical path task timeline.

Respectfully Submitted,

Town Center Sewer Action Group,

Chris Ashley, Chair
Carrie Fraser, Secretary
Wade Holtzman
Pat Jennings
Joe Sudol

Tim Clark, Selectman Liaison