

# Acton Sewers: What Was Done? What Are We Doing? What Needs To Be Done?



December 11, 2013  
2020 Committee  
Meeting

Doug Halley, Health Director

## History of Sewer Proposals?

- 1945 – Board of Health reported an immediate need for a sewerage system
- 1966 – ATM votes to take no action on sewers
  - Adams Street Land Purchased as a contingency
- 1986 – ATM approves sewers for Kelly's Corner & South Acton Center
- 1989 – Economy and phosphorous restrictions for the Assabet River put sewer project on hold

## Other Alternative Sewer Proposals?

- 1986-1999 – Several attempts are made to regionalize sewers with the Town of Maynard and one attempt with Concord
- 1993 – Mill Corner sewer option for South Acton Center developed
  - Subsurface discharge considered for the first time

## Middle Fort Pond Brook Sewer Proposal?

- 1995 – Revisions to Title 5 (On-site wastewater requirements) have widespread impact on homeowner's ability to manage their wastewater systems.
- 1996 – Sewer Action Committee Formed
- 1997-1999 – Middle Fort Pond Brook Sewer System Approved by ATM.
- Construction began in April of 2000 and completed in February of 2002



## How Was The Sewer Service Area Determined?

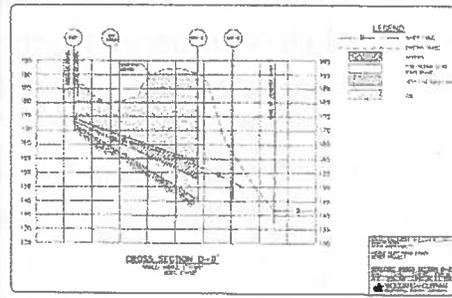
- South Acton Center as determined by 1985 SEA study
- Kelly's Corner as determined by 1987 SEA study
- Central School Campus as determined by DEP Consent Decree
- Additional infill as the discharge limitation would allow
  - Title 5 flows or water usage

## How Was The Discharge Choice Made?

- Discharge Moratorium for Assabet River ruled out water surface discharge
- Adam's Street land only alternative
  - It was in the right location
  - It had appropriate soils
  - It was bought for wastewater purposes

## How Was the Capacity Identified?

- Hydrogeologic study evaluated capacity
  - 300,000 capacity identified but negotiations with DEP set 250,000 gallons per day as conservative limit
  - Initial collection area based on average Title 5 flows
    - Doubling of actual water usage
  - Collection area expanded with the acceptance of an average water use standard.



## What determined the type of wastewater treatment?

- Location adjacent to Assabet River required a phosphorus limitation
- Sequencing Batch Reactors selected
  - Chambers allowed both aerobic and anoxic mixing
  - Self contained environment allowed the greatest control over odors
  - SCADA system allowed external and precise control of processing
- Noise and odor testing completed before operation to ensure plant had no impact on residents.

## How Were Betterments Arrived At?

- MGL Chapter 80 establishes methods of assessment
  - Frontage
    - Service area did not have consistent frontage
  - Area
    - Service area did not have consistent area
  - Use
    - Service area was well served by use comparisons



## How Were Classes of Use Identified?

- Betterments based on classes of use
  - Residential
  - Multi-Family
  - Commercial
  - Industrial
  - Non-Profit

## What About Government Uses?

- Government uses exempt from betterments
  - Construction cost can be captured at connection
  - Fee based on avoided cost
- Government Uses included
  - Town
  - Local Schools
  - Regional Schools
  - Housing Authority
  - Water District

## How Were Wastewater Flows Defined?

- Title 5 Design Flows Selected
  - Residential
    - 300 gpd
      - Based on average number of bedrooms in service area
    - Multi-family
      - 2/3 of residential gpd
        - Based on a 2 bedroom or less standard

## What About Non-Residential Uses?

- Commercial
  - 75 gpd/1,000 sq ft floor area
    - Based on build out calculation
- Industrial
  - 75 gpd/1,000 sq ft floor area
    - Based on build out calculation
- Non-Profit
  - gpd shown on existing wastewater disposal permit

## How Does Treatment Plant Capacity Translate to Betterment Capacity?

- Capacity of Treatment Plant set at 250,000 actual gallons per day
- Betterment Units based on Title 5 gallons per day
  - Which is defined as twice the actual gallons per day
- Service area can't exceed 500,000 Title 5 gallons per day (250,000 x 2)

## How Many Betterment Units can be serviced by that capacity?

- Capacity
  - 500,000 Title 5 gallons per day
- Betterment Unit
  - 300 Title 5 gallons per day
- Allowable Betterment Units
  - $500,000/300 = 1,666.67$

## What are the allowable betterment units per use?

- Sewer Betterment Units (SBUs) calculated for each use
 

• Residential	= 560.66 SBUs
• Multi-Family	= 279.09 SBUs
• Commercial	= 203.16 SBUs
• Industrial	= 307.69 SBUs
• Non-Profit	= 33.29 SBUs
• Town	= 2.16 SBUs
• Housing Authority	= 5.35 SBUs
• Schools	= <u>275.27 SBUs</u>
Total	= 1,666.67 SBUs

## How Were Project Costs Assigned?

▪ Total Project Costs of \$25,133,050 assigned in accordance with Town Bylaw	
• School avoided costs	= \$5,500,000.00
• Town avoided costs	= \$26,600.00
• Housing Authority avoided costs	= \$65,866.63
• Town contribution	= \$1,336,600.00
• Future Capacity Assignment (Supersizing)	= \$1,166,200.00
• Residential, Commercial, Industrial	= \$17,037,783.37
<b>Total</b>	<b>= \$25,133,050.00</b>

## What Were the Betterment Costs per Use?

▪ Betterment based on Total Project Cost minus avoided costs, contribution and other assignments	
• Betterment Assignment	= \$17,037,783.37
<u>divided by 1,383.89 SBUs</u>	<u>= \$12,311.52</u>
• 560.66 Residential SBUs	= \$6,902,574.24
• 279.09 Multi-Family SBUs	= \$3,436,020.93
• 203.16 Commercial SBUs	= \$2,501,207.54
• 307.69 Industrial SBUs	= \$3,788,130.28
• 33.29 Non-Profit SBUs	= \$409,850.38

## How Was The Sewer Construction Funded?

- State Revolving Fund
  - Low or no interest loan
  - 30 year term
  - Annual payment of principal
  - Bi-Annual payment of interest
  - Loan payments start with first drawdown
  - Covers only eligible costs
  - \$24,020,699.41 Borrowed



## What Other Borrowing Was Required?

- Not All Costs Covered By SRF
  - Design
  - Archaeology
- Municipal Borrowing
  - Market Rate
  - 20 year term
  - \$1,112,350.59 Borrowed

## How Was Cash Flow Managed?

- Sweeney/South Acton Gift
  - Used for cash flow as project progressed
  - Gift replenished as loans became available
- Pre-Betterments/Estimate Betterments
  - Issued in 2000
  - Equal to ½ of Financial Commitment



## Where was the Authority Given?

- Sewer Assessment Bylaw D10 
- Allocates costs
- Identifies Uniform Unit Method
- Addresses
  - User fees for land not subject to assessment
  - Assessment rates
  - Sewer Privilege Fee
  - Annual User Fee

 Use of regulation policy

## How Are The Sewers Operated?

- Woodard & Curran is the contract operator
  - Designed the system
  - Oversaw construction
  - Knowledge of the complete system
- “Start Up” contract 2002-2005
- RFP for 5 Year contract awarded to W&C in 2005
- 5 year extension of contract awarded in 2010
  - Annual amendments
    - Based on area cost of living index
    - Quality and quantity of wastewater



## What does the contract cover?

- All sewer operations
  - Wastewater Treatment Plant
  - Collection System (10 miles)
  - 11 Pump Stations
  - \$500,000 annual fee
- Pass Through Costs
  - Small unanticipated repairs or equipment replacement
  - \$50,000 annual budget
- Small Capital Purchases
  - 5 year capital plan
  - \$60,000 annual budget

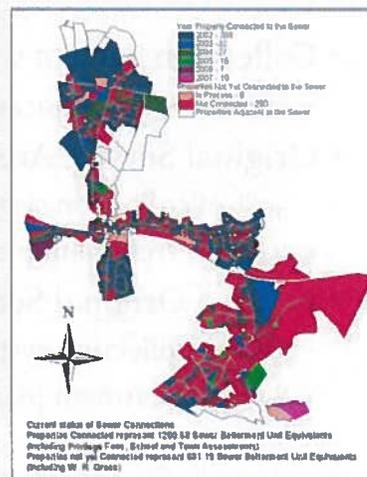
## How Are Finances Handled?

- Finance Department performs monthly billing
- Bill is based on average water use
  - Water District six winter month readings
- Sewer Use Rates
  - Total annual operating costs/total gallons per year
    - Commercial rate per gallon = \$0.02430 gpd
    - Residential rate per gallon = \$0.01710
  - Users without a water use history
    - Title 5 allocation \* 40% residential
    - Title 5 allocation \* 50% commercial
- Annual approval by Board of Selectmen



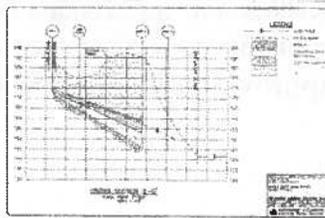
## How Many Users Does the Sewer System Have?

- How many bettered properties have connected? 680
  - 72.6% of total bettered properties
- How many Sewer Betterment Units have connected? 1075
  - 65% of total eligible betterment units
- What is the current water usage of connected users? 133,000 gpd
  - 53% of total capacity of sewer system
- What is the current treated wastewater discharge? 123,000 gpd
  - 49% of total capacity of sewer system



## What is the Potential for Additional Capacity?

- Discharge permit issued in 2000
  - Limited capacity to 250,000 gpd
- Discharge permit renewal in 2005
  - Increased capacity to 299,000
  - Based on 5 year history of on-site hydrology
  - Limiting factors
    - Groundwater mounding
    - Slope stability
    - Groundwater emergence



## How is Wastewater Capacity Linked to Supersizing?

- Collection System was Supersized to 500,000 gpd
  - \$1,166,200 cost allocation calculated for Supersizing
- Original Service Area
  - 50% of collection system capacity
  - 100% of treatment plant capacity (250,000 gpd)
- Revised Original Service Area with increased capacity
  - 50% of collection system capacity
  - 84% of treatment plant capacity (299,000 gpd)

## How Has Additional Capacity and Associated Costs Been Allocated ?

- Sewer Assessment Bylaw Amended in 2006
- Privilege Fee Defined
  - Sewer Commissioners may establish reasonable fees
    - Land not previously served
    - Land not previously assessed
  - Also reasonable fees for land previously served or assessed
    - More Intensive Use
      - Comprehensive Permit
      - Zoning change
      - Subdivision or Approval Not Required
      - Or Other Means (Special Permits)

## What Are Some Examples of Sewer Privilege Fee Assessments?

- Outside The Service Area
  - Powdermill Plaza
  - 4 High Street – Faulkner Mill
- Inside The Service Area
  - 159 Prospect Street – Davis Place
  - 83-87 River Street – Lothrop Mill
  - 139 Prospect Street – Blanchard Place
  - 288 Main Street – Edward Bravo
  - 442 Mass. Ave - Lalli Terrace
  - 3 Charter Road – Town House Common
  - Main Street – Subway & Salerno's



## What Policies Have Been Developed From Privilege Fees?

- Powdermill Plaza
  - Contribution in lieu of Privilege Fee
- Faulkner Mill
  - Provision of Affordable Housing
  - Historical Preservation
  - Advancement of municipal infrastructure
- Subway and Salerno's
  - Intensified Uses
  - Title 5 flow in excess of Build-out capacity

## What is the Status of Supersizing/Privilege Fees?

- Privilege fees received as of June 20, 2013
  - \$1,048,818
  - 90% of Supersizing Allocation
- Privilege fees by category
  - Outside Service Area
    - Residential = \$164,974
    - Commercial = \$185,000
  - Inside Service Area
    - Residential = \$653,619
    - Commercial = \$45,225

## How Are Betterments Collected?

- Final Betterments Issued in 2005
  - Election to Apportion
    - 30 year term
    - 1.55% interest
    - Quarterly tax bill
    - Right to Abatement
  - Betterment Receipts track with debt payments
    - Pre-payments are set aside
      - \$2,490,317 fund balance reserved debt service

## How Were Abatements Handled?

- Six months to petition for an abatement
  - 21 Petitions received
    - Single family homes
    - Condominium Units
    - Industrial Property
  - All resolved with the exception of WR Grace
    - Mediated settlement for taxes and betterment
      - Grace Bankruptcy Protection
      - \$3.6 m Betterment reduced by \$1.5 m to \$2.1 m
      - Conservation restriction 15.2 acres
        - Passive recreation

## How is Future Capital Accounted for?

- Each year O & M contributes funds within the Enterprise Fund to go towards major capital investments
  - \$1,435,818 Capital Reserve Designated Fund Balance

## What About the Comprehensive Water Resources Management Plan?

- Plan was required by DEP
  - Wastewater Discharge Permit conditioned
- Analyzed all Wastewater Systems in Acton
  - Review of all Health Department records
  - Interpolated depth to groundwater
- Mapped Needs Properties
  - Where wastewater system replacements
    - Not environmentally viable
    - Not economically viable

## What were the CWRMP recommendations?

- 15 Needs Area identified
  - Based on clustering of Needs Properties
  - Subjective Boundaries determined by group consensus
- Needs Areas Prioritized
  - High, Medium and Low
    - Density of Needs Properties
    - Underlying environmental factors
    - Readiness of Solutions

## What Solutions did the CWRMP recommend?

- Three Solution Methodologies Identified
  - Sewer Extensions or Construction
    - Existing Middle Fort Pond Brook Sewer System
    - Proposed Lower Nashoba Brook Sewer System in East Acton
  - Cluster Systems
    - Neighborhoods
    - Common Leaching Area
  - Wastewater Management Districts
    - Additional Maintenance and Inspection Requirements
    - Greater design requirements for construction

## What is the Status of the CWRMP Implementation?

- Spencer/Tuttle/Flint
  - Design Basis Report
  - \$16,665 per Sewer Betterment Unit
  - Special Town Meeting of 2009 - 54% - 2/3 required
- Water Resources Advisory Committee
  - Working on Stormwater Bylaw
  - Implementation of CWRMP next on agenda

## What is on the Horizon for Additional Users?

- Acton Water District
  - Water Filtration Plant
  - Access to Powdermill Pump Station
  - Anticipated 10 Sewer Betterment Units
- Parker Village Apartments
  - Private Treatment Plant
  - Access to River Street Pump Station
  - Anticipated 50 Sewer Betterment Units

## What Actions To Consider?

- **Adopt Rules And Regulations**
  - Permit Requirements
  - Connection Specifications
  - Allocation of Operating Expenses
  - Service Area Internal and External
  - Use of the Sewer System
- **Adopt Policies**
  - Use of Unallocated Wastewater flow
  - Utilization of Privilege Fee Revenue
  - Long Term Capital Plan

## What Is The Purpose Of A Sewer Regulation?

- **Protect Health Safety And Welfare**
  - Addressing existing wastewater issues
- **Protect Groundwater and Surface Water**
  - From nitrogen contamination and surface pollution
- **Protect other Sensitive Water Resource Areas**
  - Recharge of private drinking water supplies
- **Regulate Connections And Extensions**
  - Preserve and manage limited treatment capacity

## What Is The Authority?

- MGL – Chapter 83
- Sewer Assessment Bylaw D-10
  - Section 7
    - Sewer Commissioners may adopt reasonable rules and regulations with respect to the calculation of
      - Sewer assessments
      - Fees
  - Section 9
    - Sewer Commissioners may establish rules and regulations
      - The use of the public sewer system
      - Prohibiting the deposit of any harmful or deleterious substances into the system
      - Connections to the system
      - Establishing Civil Penalties

## What Does The Permit Process Require?

- Permit Application and Connection Plan Review
- Construction and Physical Connection to the Sewers
- Individual Permits Required for Common Connections
- Permit Maintained On-Site
- Notification of Work Start 24 Hours in Advance
- Completion of Work Includes Certification of Work

## What Specifications Are Required For Construction?

- Appendix A will provide guidance for
  - Chimney Detail
  - Clean-out Detail
  - Concrete Full Encasement Details
  - Drop Manhole Detail
  - Standard Manhole Invert Detail
  - Typical House Sewer Detail

## What Other Conditions for Construction Are Required?

- No Stormwater Connections
- Separate Utility Trench
- Trench Permit Required
- Grease Traps Internal and External Required
- No Back-Fill Before Inspection

## How Are The Costs of Operating the Sewer System Allocated?

- All connections billed monthly
  - Based on previous year's winter water readings
- Connections are classified by
  - Commercial or Residential
- Costs Include
  - W & C Contract
  - Billing Manpower and Overhead
  - Future Capital Costs

## What Other Billing Issues?

- No Water Use History
  - Use of Title 5 Allocations
    - .4 Residential - .5 Commercial
  - Water Use in Another Part Of Town - Transferrable
- Unpaid User Charge
  - Late Payment Penalty
  - Lien Upon Real Estate



## How Can The Service Area Be Expanded?

- Only Through Petition to the Sewer Commissioners
  - Potential Benefit to the Town
    - Payment of Non-Allocated Debt
    - Environmental Protection
    - Historical Preservation
    - Affordable Housing

## How Can Infill Be Addressed?

- Previously Assessed Property
  - Access By Right
  - Expansion of Flow Tied to Capacity
- Subject to Privilege Payment
  - Right to Betterment Capacity
  - More Capacity Based on Title 5 Wastewater Flow
    - Residential Development Per Lot
    - Commercial Development Per GPD
      - $\text{Proposed GPD} - \text{Betterment GPD} = \text{Privilege Fee GPD}$

## What Discharges Are Prohibited To Sewers?

- Flammable or Explosive Liquids, Solids or Gasses
- Toxic or Poisonous Liquids, Solids or Gasses
- pH Lower Than 5.5
- Sizes That May Cause Obstructions
- Harmful Characteristics
  - Temperature Above 150 F
  - Fats, Oils or Grease
  - Radioactive Wastes

## What Additional Measures Are Required For Discharges?

- Installation of Pretreatment or Equalization Facilities
- Maintenance of Pretreatment Facilities
- Control Manholes
- Analyses of Waters and Wastes
- Monitoring Discharges
- Notice of Accidental Discharge

## How To Address Capacity Policy?

- 250,000 GPD Permit
  - 73% Properties Connected
    - Anticipated Flow = 182,500 - Actual Flow = 123,000
  - 65% Betterments Connected
    - Anticipated Flow = 162,500 - Actual Flow = 123,000
  - Existing Permit Has Excess Capacity
    - 40,000 GPD to 60,000 GPD
      - Water Conservation
      - Conservative Water Estimates

## What Remains of Unallocated Capacity?

- WR Grace Settlement (In Service Area)
  - \$1,500,000 or 36,550 gpd
- 2005 Permit Expansion (Outside Service Area)
  - 49,000 gpd
- Under Used Capacity (In Service Area)
  - 40,000 gpd

## How Much of Unallocated Capacity Has Been Used?

- Within District
  - 17,030 GPD
  - 10 Residential and Commercial Properties
  - Remaining Capacity?
    - $36,550 - 17,030 = 19,520$
- Outside District
  - 13,200 GPD
  - 3 Residential and Commercial Properties
  - Remaining Capacity
    - $49,400 - 13,200 = 36,200$

## How Much Is Remaining Of The Unallocated Debt?

- Supersizing
  - $\$1,166,300 - \$1,048,818 = \$117,482$
- WR Grace
  - $\$1,500,000$
- Total Remaining
  - $\$117,482 + \$1,500,000 = \$1,617,482$
  - In GPD ( $(\$1,617,482 / \$12,311.52) * 300 \text{ GPD}$ ) = 39,415 GPD

## Capacity Policy Recommendation

- Match Unallocated Debt With Unallocated Capacity
- Allow Beneficial External Expansion Until Debt is Met
- Reassess External Expansion When Debt is Met
- Allow Internal Expansion As Required
- Reassess Internal Expansion At Capacity Plateau
  - 200,000 gpd discharge from treatment plant
- Task Water Resources Advisory Committee
  - Identify CWRMP Needs Area Requiring Capacity

## How Much Should We Set Aside For Future Capital?

- Sewer System Cost \$25.1 million
- Present Capital Set Aside \$1.4 million
  - RIB Replacement
  - SBR Replacement
  - Pump Station Replacement
- Capital Goal?
  - 15% to 20% Of Original Cost in Hand by 2032?
  - Hard Infrastructure 30 to 50 year life span
  - Mechanical, Electrical 15 to 20 year life span

## Next Steps?

- **Complete Draft Rules And Regulations**
  - Submit to BOS for Comments
  - Submit to Boards, Committees, Staff for Comments
  - Advertise to Public for Comments
  - Public Hearing for Adoption
- **Complete Draft Policy**
  - Submit to All as Stated Above
  - Adopt at Public Meeting

